CITY OF WEST DES MOINES
CITY COUNCIL MEETING COMMUNICATION

DATE: November 2, 2015

ITEM: Motion – Adoption of Bicycle Master Plan

FINANCIAL IMPACT: None at this time.

BACKGROUND: The Council is asked to consider the final draft of the Bicycle Master Plan. No changes have been made since the plan was presented at the City Council Workshop on September 21, 2015.

The Bicycle Master Plan was developed by the Bicycle Master Plan Task Force comprised of two Bicycle Advisory Commission members, two Parks and Recreation Advisory Board members, and one City Council member. The plan was reviewed multiple times by the Commission and Board and has received feedback from the public through an on-line survey, e-mail comments, and a public open house held on July 28, 2015.

The plan was formally approved by the Bicycle Advisory Commission on October 1, 2015 and by the Parks and Recreation Advisory Board on October 15, 2015.

OUTSTANDING ISSUES: None.

RECOMMENDATION: That the Council adopt the Bicycle Master Plan.

Lead Staff Member: Sally Ortgies

STAFF REVIEWS

Department Director	
Appropriations/Finance	
Legal	
Agenda Acceptance	RTJ

PUBLICATION(S) (if applicable)

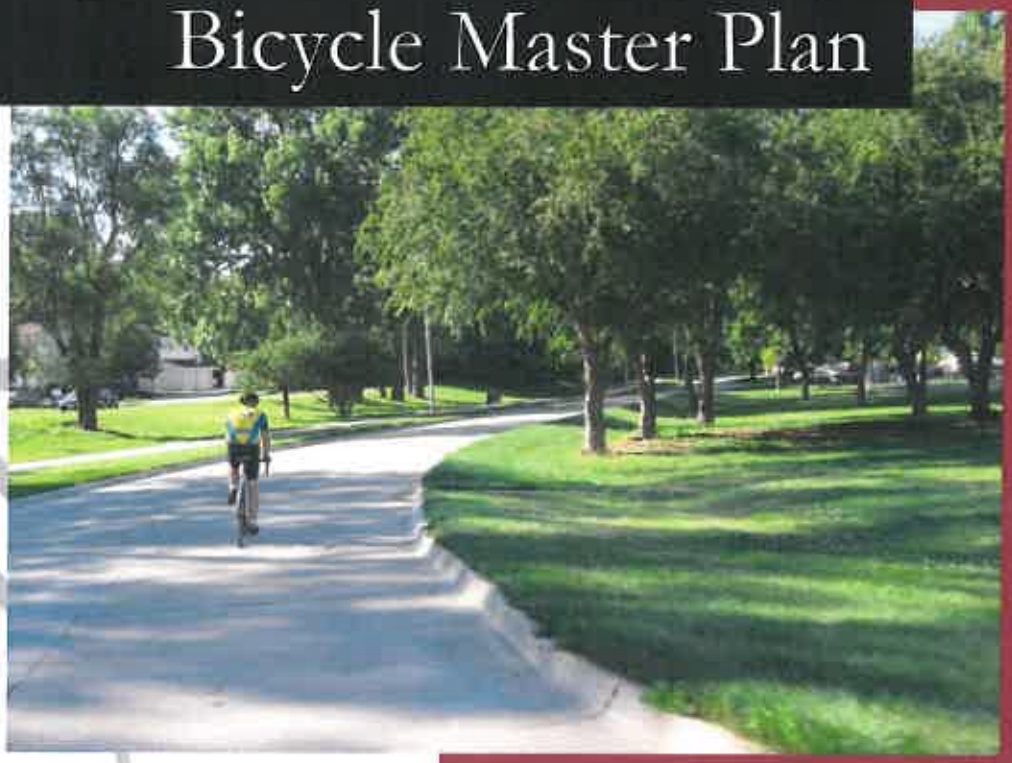
Published In	
Dates(s) Published	

SUBCOMMITTEE REVIEW (if applicable)

Committee	N/A		
Date Reviewed			
Recommendation	Yes	No	Split

2015

City of West Des Moines Bicycle Master Plan



Revised September 2015

ACKNOWLEDGEMENTS

The City of West Des Moines appreciates the efforts of the numerous residents and other bicycling enthusiasts who participated in the development of this updated plan. In addition, the following City officials and staff contributed to the West Des Moines Bicycle Master Plan.

Bicycle Master Plan Task Force

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Steve Gatton, Bicycle Advisory Commission
Joe Hrdlicka, Parks and Recreation Advisory Board
John Mickelson, City Councilmember
Forrest Ridgway, Parks & Recreation Advisory Board

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The City also acknowledges the work of the Consultant Team of Steve Durrant, Principal, Ann Freiwald, Senior Planner, and Hannah Kapell, Planner of Alta Planning+Design. The original Bicycle Master Plan prepared by Alta Planning+Design in February 2011 provided base information for this updated document.

alta
PLANNING + DESIGN

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Definitions

Bike Facilities	**Accomodations for bicycles that can include shared-use paths (also referred to as "trails" and "multi-use paths"), on-street bikeways, or recreational areas such as mountain bike parks or cyclocross courses.**
Bike Lane	Designated exclusively for bicycle travel, bike lanes are separated from vehicle travel lanes with striping and are indicated by pavement stencils and signage. Bike lanes are most appropriate on streets where higher traffic volumes and speeds indicate a need for greater separation.
Cycle Track	A cycle track is a hybrid type bicycle facility combining the experience of a separated path with the operational infrastructure of a conventional bike lane. They are adjacent to the roadway but separated from motor vehicle traffic by a physical barrier or other buffer.
Greenway/ Greenbelt	Strips of open space usually in conjunction with streams and drainageways which principally serve as both a public access to the drainage system and as passive recreation areas. These strips can offer intermittent recreational areas, as well as serving as scenic connections and trails for pedestrian and bicycle riders between major park facilities. (West Des Moines City Code 10-1-2: Definitions)
Multi-Use Trail Paved or Unpaved	A trail physically separated from motor vehicle traffic by an open space or barrier and either within the right of way or within an independent right of way. Multi-use trails accommodate pedestrians, skaters, wheelchair users, and other non-motorized users. In some cases, equestrian and snowmobile use may be permitted.
Paved Shoulder	Typically found in rural areas, this facility is a paved roadway with a paved shoulder separated from the through lane and wide enough for bicycle travel. Shoulder bikeways often, but not always, include signage alerting motorists to expect bicycle traffic along the roadway.
Quiet Street	Also known as bicycle boulevards, quiet streets are developed through a combination of traffic calming measures, signing, pavement marking, and other streetscape treatments, and are intended to slow vehicle traffic while facilitating safe and convenient bicycle travel. Appropriate treatments depend on several factors including traffic volumes, vehicle and bicycle circulation patterns, street connectivity, street width, physical constraints, and other parameters.
Shared Lane Marking	Shared lane markings are high-visibility pavement markings that help position bicyclists within a shared vehicle/bicycle travel lane. These markings are typically used on streets where dedicated bike lanes are desirable but are not possible due to physical or other constraints.

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Signed Bike Route	Signed bike routes are located along roadways that are open to both bicycle and motor vehicle travel and recognized as bicycle friendly. Bike route signage is used to increase driver awareness of bicyclists on the roadway.
Single Track Trail	A single track is a narrow mountain biking trail that is approximately the width of the bike. It is frequently smooth and flowing, but it may also exhibit technical rocky sections and may be crisscrossed with tree roots.

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Chapter 1. Introduction

Figure 1. Cyclists in West Des Moines benefit from an extensive regional trail system.

The West Des Moines Bicycle Master Plan builds on existing efforts completed to-date, while also exploring new opportunities to encourage bicycling for transportation and recreation. The city is both surrounded and crossed by an extensive trail system. The first on-street bicycle facilities were installed in 2012. The next step is connecting these facilities with a network of complete streets that integrate bicycling into the transportation network.

The West Des Moines Bicycle Master Plan considers bicycle facilities that have been proposed in other local and regional plans, as well as potential transit and trail extensions. The plan is based on previous efforts such as recommendations made by the Des Moines Area Metropolitan Planning Organization (MPO) in the *Tomorrow Plan* (2013), *Mobilizing Tomorrow* (2014) and *The On-Street Bikeway Feasibility Study* (2014), and trails that were identified in the *City of West Des Moines Master Parks and Trails Plan*.

The goal of this plan is to provide an assessment of West Des Moines' existing bicycling and trail policies and environment and a bicycle facilities plan showing potential projects that will be prioritized annually by the Bicycle Advisory Commission as part of the City's budget process. Strategies to enhance the city's non-motorized environment will include filling gaps in the local and regional trails, identifying innovative solutions for integrating bikeways into the existing street system, including bicycling in on-going transportation planning, design and maintenance activities, and improving education, encouragement and enforcement programs.

Setting

West Des Moines is a rapidly-growing community located just west of the City of Des Moines. The City of West Des Moines includes areas within Polk, Dallas, Madison and Warren Counties. As of the 2010 Census, the city population was approximately 56,609 people. The Des Moines-West Des Moines Metropolitan area was named the #1 Best Medium-Sized Metro Areas for Homeownership by NerdWallet Finance Blog. Three major factors were used to determine the selection: home availability, affordability, and growth within the area. Movoto.com in January 2014 ranked West Des Moines as the #2 best small city to retire to and as the #26 most exciting small city in the nation. West Des Moines was recognized by Livability.Com as one of the Top 100 Places to Live. West Des Moines ranked high for economics and education. The Des Moines-West Des Moines metro area was identified as the best metro in the Midwest and the eighth best in the nation for young adults by The Business

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Journals in March 2013. In addition, the City of West Des Moines received Honorable Mention as a Bicycle Friendly Community from the League of American Bicyclists in Spring 2012.

Goals and Objectives

The West Des Moines Bicycle Master Plan begins with the idea that city streets are for moving people and goods, not just vehicles. Questions regarding traffic and street design should start with the question of how a city street can best serve the needs of the local land uses.

This plan builds on the existing foundations of local, regional and federal community sensitive design policies that are supportive of making bicycling a regular fixture in communities throughout nation. These existing policies include a Des Moines Area Metropolitan Planning Organization recommendation to preserve and develop a multimodal intermodal transportation system that facilitates the safe and efficient movement of people and goods as well as existing local policies recognizing bicyclists as rightful users of the roadway.

Addressing the Five Es

This plan recommends that the City take a "Five Es" approach to improving conditions for bicycling in West Des Moines. When any traffic issue is examined, the "Five Es" must be considered: *Engineering*, *Education*, *Encouragement*, *Enforcement* and *Evaluation*. In order to gain the full benefit of bicycle facilities, the City needs to encourage bicycling and promote new facilities. People need to be educated about safe bicycling techniques and how to safely share the road whether they drive a motor vehicle or a bicycle. Finally, bicycle use should be evaluated just as the City evaluates roads by counting cars, trucks and crashes. West Des Moines has made big strides with significant investments in trail building, and is beginning to invest in on-road facilities to complete the network and in the other Es. The Bicycle Advisory Commission (BAC) has developed the following goals in order to increase West Des Moines' overall bike-friendliness and bike trips by addressing all of the Es.

Engineering Goals

- Provide a safe and enjoyable trail system
- Develop trail connections with other Des Moines metro cities and counties
- Provide safe and convenient bicycle access to the community
- Ensure that the trails and on-street bikeways are properly designed and maintained
- Expand the bike network and increase connectivity through the use of different types of on-street bicycle facilities
- Increase amount of bicycle parking at popular destinations
- Adopt a complete streets policy

Education Goals

- Promote overall safety awareness for bicyclists
- Educate street users, both cyclists and drivers, to share the streets and interact safely
- Provide education on laws related to bicycling to both bicyclists and motor vehicle drivers

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Encouragement Goals

- Promote recreational/family riding and trail safety
- Enhance the trail and on-street bike facility signage program with wayfinding signs
- Promote bicycling in general and communicate the many benefits of bicycling
- Encourage employers to facilitate bicycle use among employees
- Promote intermodal travel public transportation and bicycling
- Provide broad range of bicycle facility choices for users of various abilities and comfort levels

Enforcement Goal

- Ensure all applicable City policies, plans, codes and programs are updated, implemented, and enforced
- Protect the rights of cyclists to operate legally on the roads, protect cyclists against careless, reckless or dangerous driving, and ensure cyclists follow the laws and operate safely

Evaluation Goals

- Evaluate bicycle related projects and collect usage data
- Reduce the number of bicycle crashes in the community
- Achieve highest level possible in Bicycle Friendly Community program

Public Involvement

City staff, stakeholder groups, and West Des Moines residents helped guide the original plan in 2011 and its revision in 2015. Community workshops were held throughout the project's duration, enabling residents and other interested individuals to express concerns and ideas for improvements. The 2011 planning process included a Steering Committee, established to identify bicycle and trail issues from the standpoint of various interest groups and organizations. The Steering Committee was made up of members of the ad-hoc Bicycle Advisory Committee, the Des Moines MPO, the Chamber of Commerce, the Plan and Zoning Commission, Des Moines Area Regional Transit Authority (DART), the Parks & Recreation Advisory Board, and City Council. The 2015 revision was guided by a Bicycle Master Plan Task Force made up of members of the City Council, Parks and Recreation Advisory Board, and Bicycle Advisory Commission.

Figure 2. Open houses were held during the planning process to solicit feedback from the community.

Contents of the Plan

The West Des Moines Bicycle Master Plan is organized as follows:

- **Chapter 1: Introduction**, provides an overview of this plan and its purpose.
- **Chapter 2: Existing Conditions**, describes West Des Moines' existing bicycle and trail network and summarizes strengths and weaknesses of the system.
- **Chapter 3: User Needs Assessment**, evaluates safety data to identify locations for facility and programmatic improvements.

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- **Chapter 4: Recommended Bicycle Network**, depicts the recommended system of bikeways and facility types to provide opportunities for cycling throughout the city and includes the bicycle plan map.
- **Chapter 5: Recommended Programs: Education, Enforcement, Encouragement, & Evaluation,** describes education, encouragement, enforcement and evaluation measures the City of West Des Moines and/or other local agencies should implement to promote bicycling, increase bicyclist safety, and increase the awareness of bicycling as a viable travel mode.

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Chapter 2. Existing Conditions

This chapter describes the current trail and on-street bikeway network in West Des Moines. The chapter begins with an assessment of existing bicycle and trail facilities. The second section discusses important destinations for bicyclists, particularly connections to downtown Des Moines, trail connections, transit and schools. An analysis of system strengths and weaknesses follows, which highlights key areas where improvements may be needed.

Existing Bicycle Facilities

Federal and state bicycle planning and design guides define bikeways as preferential roadways accommodating bicycle travel through the use of bicycle route designations, bike lane striping, or multi-use trails to physically separate cyclists from motorists.

Existing Multi-Use Trails

Multi-use trails are often viewed as recreational facilities, but they are also important corridors for utilitarian trips. Off-street facilities that accommodate bicycle travel can be categorized into the following typologies:

- A **greenway trail** is a facility that has an exclusive right-of-way.
- A **park trail** is a shared-use facility located within a park.
- A **side path** is a two-way trail on one side of the road located within the road right-of-way

The following section describes these off-street facilities in greater detail.

Greenway Trails

Greenway trails are typically located within an exclusive corridor and are not directly adjacent to a roadway. They provide access across the city and connect to the regional network. Greenway trails are frequently used by cyclists riding long distances, whether to go to work in neighboring Des Moines or to get out of the city for a 50-mile weekend ride. In addition to fast-moving cyclists, recreational riders use the greenway trails for family outings or more leisurely rides.

The Jordan Creek Greenway Trail acts as the spine for the West Des Moines network, connecting neighborhoods into the regional trail system. Running for five miles through the center of West Des Moines, the Jordan Creek Trail provides direct connections to West Des Moines' Levee Trail, which connects to the Walnut Creek Trail in Des Moines. There are currently seven trailheads located along the Jordan Creek Trail providing easy access to the trail. The trail heads are located at:

- Westridge School - 5500 E.P. True Parkway
- Southwoods Park – 350 S. 35th Street
- Jordan Creek Park - 50th Street & Railroad Tracks
- Fairmeadows Park - 22nd Street & Locust Street
- Brookview Park – 400 81st Street
- Raccoon River Park – 2500 Grand Avenue
- Valley View Park – 255 81st Street

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Side Paths

The majority of multi-use trails in West Des Moines are directly adjacent to roadways and within the street right-of-way. These 'side paths' serve both bicyclists and pedestrians and are wider than a standard sidewalk. Side paths provide commuter routes between residential areas and employment centers, as well as to retail areas. They are used by recreational riders mainly to access the greenway or regional trail network. The high frequency of crossings limits fast and continuous riding.

Figure 3. Side paths are provided throughout the city to accommodate bicyclists and pedestrians.

Side paths require specific design at roadway crossings to ensure that riders can safely cross the road. Safety concerns include increasing cyclist visibility, limiting vehicle right turning movements at the trail crossing, and ensuring that cyclists come to a stop when cars are present and proceed through the intersection with caution. Good design, utilizing standards adopted by the City, can be used to mitigate these concerns.

Because side paths accommodate both bicycle and pedestrian traffic, they should provide sufficient passing width. A shared facility should be a minimum of 10 feet wide. The majority of West Des Moines' existing side paths are sufficient width.

Park Trails

Finally, several parks in West Des Moines provide trails that bicyclists can use for recreation and to connect into the network. As these trails are usually short and often loop on themselves, they are less significant for the bicycle transportation network. However, they are important facilities where families can enjoy a short outing or where residents can safely learn and practice their bicycling skills.

On-Street Bikeways

On-street bikeways can take several forms, depending on the speed and volume of traffic on the roadway, space available to accommodate bicyclists, and type of users expected on the facility. Bicyclists can share the road with cars on streets with lower traffic speeds and volumes, or on roadways with a wide shoulder where a bicyclist can avoid riding in traffic. Streets that have low traffic speeds and that may be appropriate for bicycling without significant changes are identified as 'bike friendly streets,' discussed in the next section.

Figure 4. Shared land markings provide routes for bicyclists.

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While some streets might be acceptable for bicycling without specific accommodation, designating particular streets as bicycle facilities encourages residents and visitors to try bicycling. Treatments improve visbility and clarify right-of-way for bicyclists and drivers, improving safety and comfort of cycling. In addition, streets with higher traffic speeds and volumes are not comfortable for the majority of people considering bicycling. Additional facilities such as bike lanes and signs may make bicycling a viable transportation choice on some streets. Streets with over 20,000 vehicles per day are generally not recommended for on-street bicycle facilities.

It is important to note that bicycles are permitted on all roads in West Des Moines, except Interstate highways and on sidewalks in business districts (1985 Code §2.1-5.0[illegible]). As such, the city's entire street network is effectively the bicycle network, regardless of whether or not a bikeway stripe, stencil, or sign is present on a given street. The designation of certain roads as bike routes is not intended to imply that these are the only roadways intended for bicycle use, or that bicyclists should not be riding on other streets. Rather, the designation of a network of on-street bikeways recognizes that certain roadways are preferred bicycle routes for most users, for reasons such as directness or access to significant destinations, and allows West Des Moines to focus resources on building this primary network.

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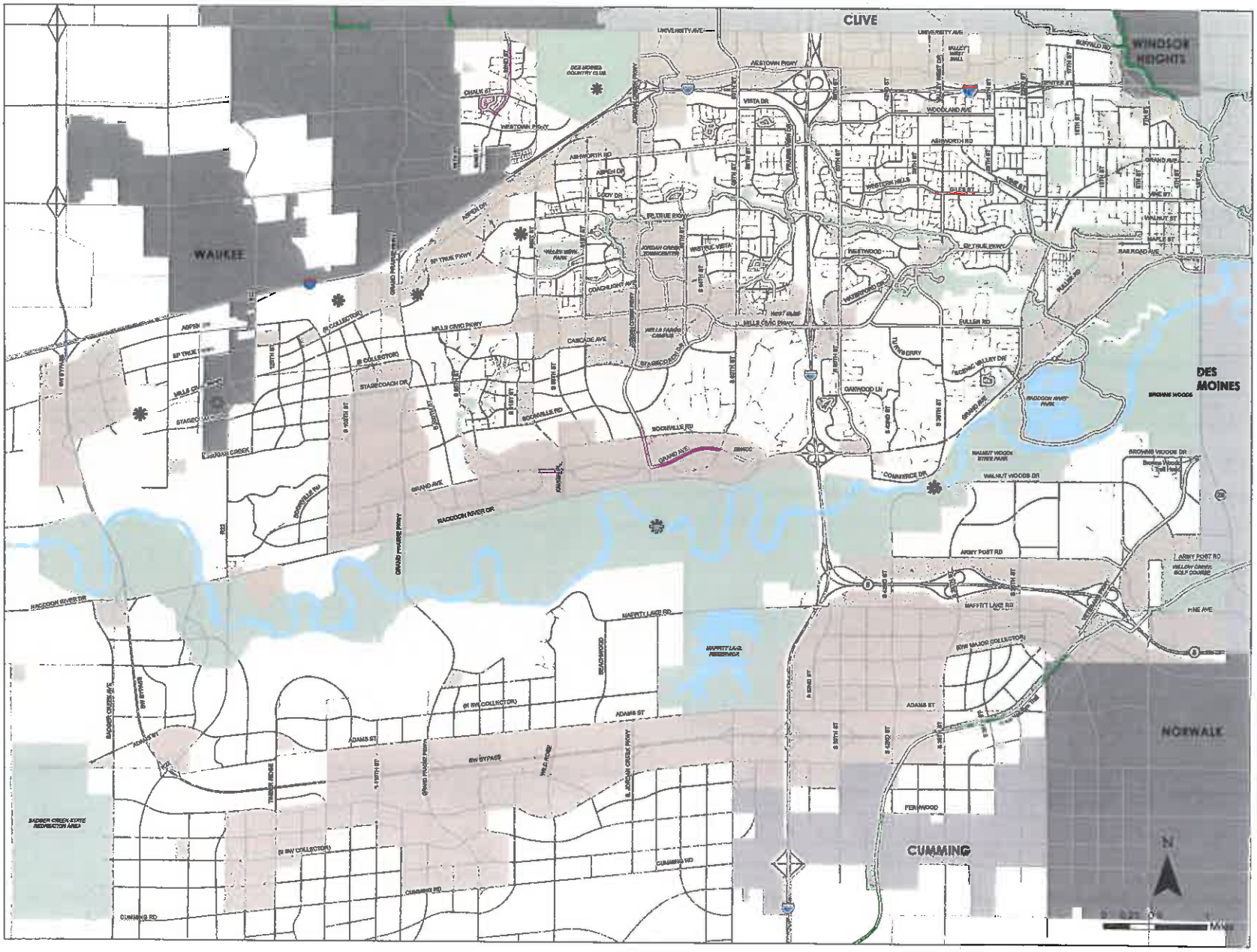
EXISTING BICYCLE & TRAIL NETWORK

West Des Moines, Iowa



MAP LEGEND

- Non-Residential Land Use
- Residential Land Use
- Open Space
- ✱ Further street alignment studies needed

EXISTING BICYCLE & TRAIL FACILITIES

- Shared Lane Bike Facility
- Greenway Trail
- Park Trail
- Sidepath Trail

THE CITY OF West Des Moines.

Source: City of West Des Moines
Author: maa
Date: May 2015

Bike-Friendly Streets

Most neighborhood or residential streets in West Des Moines can be classified as "shared roadways." Shared roadways accommodate vehicles and bicycles in the same travel lane (Figure 6). The most suitable roadways for shared vehicle/bicycle use are those with lower posted speeds (25 MPH or less) or lower traffic volumes (3,000 average daily traffic volumes or less). The West Des Moines Bicycle Master Plan identifies shared roadways on quieter streets that present key connections through the bicycle network as 'bike-friendly streets.' These are routes that cyclists may already use to ride around the city, or that present good on-street connection opportunities.

Figure 6. Bike friendly streets are low-speed and low-volume roadways that comfortably accommodate bicycle travel.

These streets present a generally good environment for bicycling. Formally designating these 'bike-friendly' streets as bicycle boulevards requires little more than signage and pavement markings, as well as improving crossings at major streets. Other streets that have higher traffic volumes and speeds (but not sufficient to warrant bike lanes, shared lane markings or cycle tracks), may require traffic calming techniques to reduce vehicle speeds while limiting conflicts between motorists and bicyclists. Bicycle boulevards have been shown to encourage new or inexperienced bicyclists to ride and are a key facility type for the bicycle network.

Bicyclist Destinations

It is particularly important for the bicycle and trail networks to provide access to destinations popular among pedestrians and bicyclists. Within West Des Moines, popular destinations are likely to include:

- **Educational facilities:** elementary schools, junior high schools, Valley Southwoods Freshman High School, Valley High School, Dowling Catholic High School, and Iowa Christian Academy
- **Employment centers:** Wells Fargo, Farm Bureau Financial Services, Athene, Hy-Vee headquarters, Mercy West Lakes and Methodist West Hospitals, etc.
- **Commercial areas:** Jordan Creek Town Center, Valley West Mall, West Glen, neighborhood commercial areas, etc.
- **City/School campus**, including West Des Moines Public Library, West Des Moines City Hall, Valley Stadium, Learning Resource Center, Valley Southwoods School, and Jordan Creek Elementary School
- **Historic Valley Junction**
- **Aquatic centers:** Holiday Aquatic Center and Valley View Aquatic Center
- **Nearby communities:** Des Moines, Norwalk, Cumming, Waukee, Clive, and Windsor Heights

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- **Raccoon River Park, Browns Woods, Walnut Woods, and other natural areas** outside West Des Moines including Waterworks Park

Transit Connections

Ensuring a strong bicycle link to transit is an important part of making non-motorized transportation a part of daily life in West Des Moines. There are several main components of bicycle transit integration:

- Allowing bicycles on transit (see Fig. 6)
- Providing bicycle parking at transit stops
- Improving connections between bikeways and transit

Figure 7. DART's Bike & Ride program provides resources for bringing bicycles on the bus.

Source: Des Moines Register

DART, the Des Moines Area Regional Transit Authority, operates three regular routes, one flex route, and two express routes in the area. The majority of these routes are located in the northeast portion of the city, with no regular transit routes serving the area west of Jordan Creek Parkway or south of Fuller Road. DART also provides several shuttles and daily on-call paratransit services.

All regular and express buses have bike racks with capacity for two bicycles. DART's Bike & Ride program includes a website showing proper use of the bike racks on buses and tips for taking a bicycle on the bus. There is currently no bicycle parking provided at bus stops.

System Strengths and Weaknesses

This section provides an analysis of the existing conditions for bikeways in West Des Moines, outlining opportunities for improvement. The section also identifies potential barriers to accommodating and encouraging bicycle trips, which this plan seeks to overcome.

Strengths

Various characteristics foster an environment where bicycling is safe and enjoyable in West Des Moines. These system strengths are described below.

Scenic and Well-Maintained Shared-Use Paths

Residents of West Des Moines benefit from an extensive network of almost 50 miles of greenway trails, park trails, and side paths. These facilities encourage residents to walk and bicycle for exercise and recreation and connect residents to the natural environment. The geographic coverage of existing facilities also ensures that many residents have easy access to the shared-use path network.

The City's Capital Improvements Plan (CIP) contains funding for trail renovation and maintenance.

Potential Connections to the Regional Trail System

Central Iowa is home to approximately 676 miles of trails, which provide an extensive network for cyclists on a 50-mile ride, commuters heading into a neighboring jurisdiction or coming to West Des Moines for work, or families out for a change of scenery. The West Des Moines Bicycle Master Plan

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seeks to take advantage of the existing system by providing access into the regional network wherever possible. Key opportunities include:

- Raccoon River Valley Trail in Waukee
- Walnut Creek Trail in Clive, Windsor Heights, and Des Moines
- Great Western Trail in West Des Moines, Des Moines and Cumming

Gentle Rolling Terrain

West Des Moines' topography consists of gently rolling hills with few challenging hills to deter bicycling. The gentle rolling terrain allows for long sight distances and allows motorists time to react to the sighting of bicyclists on the road.

Recent and Planned On-Street Bicycle Facility Improvements

Since 2011, several on-street bicycle facilities have been installed with additional facilities planned. Although these are small steps, it is important for the City to continue making progress. Since the recently installed shared-lane markings were the first in West Des Moines, the City has made efforts to educate residents through articles in the WDM Magazine and booths at City events.

Use of Warning Signage and Grade Separation at Trail/Roadway Crossings

Many streets approaching existing trails include warning signage alerting motorists to the presence of bicyclists and pedestrians crossing the roadway. This improves the visibility of cyclists and pedestrians, increasing the safety and comfort of using the trail system. In 2008, the City of West Des Moines, in conjunction with surrounding cities, created a consistent trail sign system for trail users who call 911 to identify their location on a trail. The project utilizes a grid system to ensure consistency between locations. The first location to receive signage was Jordan Creek Trail between Valley West Drive and 60th Street.

While the interstates running through West Des Moines create significant barriers to bicycling connectivity, grade separated crossings reduce the impact of these obstacles. Bicyclists can cross Interstate 35/80/235 at the following locations.

- 60th Street overpass (Side Path)
- 50th Street overpass (Side Path)
- 42nd Street overpass
- Valley West Drive overpass
- 28th Street overpass
- 22nd Street underpass
- 17th Street underpass
- 8th Street underpass
- Walnut Creek Trail underpass
- Ashworth Road
- I-80 Trail Bridge (between 60th & Jordan Creek Parkway)

Bicyclists can cross Interstate 35 at the Jordan Creek Trail (underpass), the Mills Civic Parkway Side Path (overpass), and at Ashworth Road (overpass). In addition, cyclists on the Crossroads Park Trail can cross under Ashworth Road. New facilities should be designed to take advantage of these existing assets, with particular consideration for providing safe access to the bridges.

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Trail underpasses also exist at Jordan Creek and E.P.True Parkway, Valley West Drive, 50th Street, 60th Street, and Jordan Creek Parkway. There are also trail underpasses under E.P.True Parkway at the Fairmeadows Greenway and under Mills Civic Parkway at the Ashawa Greenway.

Potential for On-Street Bicycle Signal Activation

Bicycle signal activation is an important feature for bike routes, enabling cyclists to trigger traffic signals without dismounting and using the pedestrian signal or waiting for an automobile to trigger the green phase. Inductive loop detectors or video detection are the standard mechanisms for signal detection. Loop detectors can be calibrated to detect bicycles,[1] and should be marked along designated bikeways with pavement markings that indicate where bicyclists should wait. In snowy situations, pavement markings will be helpful where streets are plowed and cyclists may be more timid taking the lane in the absence of markings.

Existing video detectors can also be calibrated to respond to the presence of bicycles. The City of West Des Moines provides video detection at several locations and adding detection for cyclists is a low-cost accommodation.

Experienced and Engaged Bicycle Advisory Commission and Parks and Recreation Advisory Board

The original Bicycle Master Plan prepared in February of 2011 included a recommendation to create a Bicycle Advisory Commission appointed by the West Des Moines City Council. The Council approved an ordinance authorizing the formation of the Commission and appointed the first Commission members on April 4, 2011. The purpose of the Commission is to advise and assist the West Des Moines City council in the development, maintenance, and promotion of bicycle facilities and programs within the City.

The Parks and Recreation Advisory Board plays an equally important role through its guidance of the planning and development of the City's trail system. Both groups represent an important asset for the city, as community members can build support for bicycling and for implementing the West Des Moines Bicycle Master Plan.

Weaknesses

Bicyclists in and around West Des Moines face a variety of challenges. Major barriers, challenging intersections, and network gaps are identified below.

Limited Facility Types

The existing bicycle network serves residents by providing direct routes through the city and connecting to recreational opportunities. The separation provided by the trail system is beneficial to new or inexperienced cyclists, who may be uncomfortable riding in traffic. However, the system as it exists does not serve recreational riders who want to quickly connect into the regional trail system for 50-mile or longer rides. The system also does not serve utilitarian cyclists who want to ride to a

[1] Standard loop detectors can be calibrated to detect any bicycle, regardless of frame material, as the bottom bracket and gears contain sufficient metal for detection. In addition, "Lean for the Green" programs instruct cyclists with techniques to trigger the signal.

workplace or shopping center quickly, without the interruption of waiting for traffic at every unsignalized intersection. A complete network of on-street bikeways and off-street trails would provide routes for cyclists of all abilities and trip purposes.

Barriers

Major roadways and rivers are significant barriers to bicycling and walking in West Des Moines. Interstates serve as barriers due to the lack of bicycle facilities along and across them, although crossings are provided, as previously discussed. Highways are also barriers to bicycle movement due to higher vehicle speeds and volumes, creating uncomfortable and potentially unsafe crossing conditions. Finally, roads that are angled relative to other roadways can present difficult crossing situations for bicyclists. Examples include Grand Ave, Mills Civic Parkway, Vine Street and E.P. True Parkway.

The Raccoon River represents another significant barrier to non-motorized transportation in West Des Moines, with limited crossing opportunities (I-35 and 1st Street are the only currently existing crossings). Finally, the railroads represent challenges for bicyclists. Other than one railroad crossing on the Jordan Creek Trail that is separate from a road, at-grade railroad crossing opportunities are limited to major roads that currently have minimal pedestrian or bicycle facilities. Poor railroad crossings can be dangerous to cyclists, with potential for riders to fall on the tracks or be forced into traffic.

Challenging Intersections

Major intersections can be challenging for cyclists riding on the shared-use path system, especially those that do not provide pavement markings to indicate a pedestrian crossing.

Most intersections have pedestrian signals, but pavement markings indicating the crossing improve the visibility of cyclists in an intersection to drivers crossing the bikeway. From a bicycle standpoint, the preferred solution is to provide a bicycle push-button to activating the signal, as well as a marked crosswalk and pedestrian signal head.

Other factors that make intersections challenging for cyclists include: length of intersection, amount of right- or left-turning automobile traffic, offset or angled intersection, and other issues. Intersections of paths and arterial roadways should be marked with a crosswalk at a minimum; additional treatments may also be required to increase safety.

In addition to these locations where cyclists are primarily moving straight through the intersection on a side path, other intersections can be challenging for a cyclist turning off of the side path. Merging into traffic from a side path can be dangerous for cyclists, as drivers are not expecting traffic from the right. At intersections with collector and local streets, stop signs along the trail can be confusing for both riders on the side path and for drivers.

Limited Street System Connectivity and Narrow Streets

Although streets are well-connected in the Valley Junction area of West Des Moines, there is minimal east-west connectivity in other areas of the city, particularly for bicyclists. In both directions, roads providing the most connectivity and covering longer distances tend to be high-volume streets lacking bicycle facilities. Some of these principal arterials include Ashworth Road, Westown Parkway, and Grand Avenue.

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Streets in West Des Moines also tend to be quite narrow, within the American Association of State Highway and Transportation Officials (AASHTO) *Geometric Design of Highways and Streets* guidelines. Large vehicles (e.g., trucks, buses, and recreational vehicles) and high vehicle speeds and volumes create challenging, uncomfortable, and potentially unsafe bicycling conditions on streets that do connect through. These conditions present additional challenges on major roads with minimal or no bicycle facilities. Streets without paved roadway shoulders or wide outside lanes present challenging bicycling conditions, as cyclists must ride in the roadway with motorists. Example corridors include Ashworth Road, 8th Street, Vista Drive, and Woodland Avenue, among others.

Gaps

While bicyclists in West Des Moines benefit from the many off-street bicycle facilities, a few of these are incomplete and do not offer continuous travel opportunities. In the majority of cases, gaps are due to adjacent properties that have not yet been developed. Opportunities exist to require the installation of side paths along streets adjacent to undeveloped properties with City Council approval through the City's sidewalk program.

Lack of Wayfinding Tools

West Des Moines' bikeway system could benefit from signage and additional wayfinding tools to orient users and direct them to and through major destinations like schools, parks, and commercial areas. As the on-street network is being developed, cyclists should be directed to key destinations along the bikeway, to raise awareness of the new facilities and to encourage more residents to try bicycling to different destinations around the city.

User Conflicts on Trails

Conflicts can arise between faster-moving cyclists and slower-moving pedestrians along trails in West Des Moines, particularly where they pass through areas with higher demand for bicycling and walking. Faster-moving cyclists sharing the trails with pedestrians can lead to potentially dangerous conflicts between users. Ten feet is the minimum recommended width for a shared-use path, with 12 feet or greater the preferred width. The majority of existing trails in West Des Moines are ten feet wide. A few 8 foot wide trails exist including the following: a very short section of 50th Street Trail, S. 19th Street Trail, Fairmeadows Greenway Trail, and trails within some neighborhood parks. West Des Moines should consider widening these trails where possible and should adopt design guidelines requiring new multi-use trails in heavily used areas to be a minimum of twelve feet wide.

West Des Moines should also consider implementing programs to address "trail etiquette" by educating trail users about how they should use trails including how to safely pass other trail users.

Side Path Safety Concerns

According to the 2012 edition of the *AASHTO Guide for the Development of Bicycle Facilities* it is generally preferable to not develop trails adjacent to roadways. However, the Guide recognizes that there are situations where this may be the only option. Also known as "side paths", these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic. This can result in wrong-way riding where cyclists continue on-street, and motorists entering or crossing the roadway at intersections and driveways may not notice bicyclists coming from their right,

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as they are not expecting traffic coming from that direction. Stopped motor vehicle traffic on cross-streets or driveways may block path crossings. Even bicyclists coming from the left may also go unnoticed, especially when sight distances are poor. As bicyclists gain experience and realize some of the advantages of riding on the roadway, some riders may stop using paths adjacent to collector and arterial roadways. Bicyclists may also tend to prefer the roadway as pedestrian traffic on the shared-use path increases due to its location next to an urban roadway. Riding in the roadway is permitted where a side path is provided.

When designing a bikeway network, the presence of a nearby or parallel path should not be used as a reason to not provide adequate shoulder or bike lane width on the roadway, as the on-street bicycle facility will generally be superior to the "side path" for experienced cyclists and those who are cycling for transportation purposes. Bike lanes should be provided as an alternate (more transportation-oriented) facility whenever possible. The City Code allows bicyclists to ride in the roadway even where a side path is provided.

Driver Behavior/Lack of Awareness of Bicycling Facilities

Research indicates that high levels of bicycling lead to improved safety, through drivers' increased visibility and awareness of bicyclists.[2] Where motorists are not aware to watch for bicyclists at intersections or on street, they tend to ignore marked crosswalks and warning signs. Trail users then have to wait until the road is clear before proceeding across the street. Motorists' lack of compliance with posted speeds is another safety concern, particularly to bicyclists on the shoulder of major roads.

Review of Existing Plans and Legislation

Current legislation and policies in the City of West Des Moines, Des Moines Area Metropolitan Planning Organization (MPO), DART, and other agencies and jurisdictions shaped the recommendations presented in this plan. The legislation and policy review considered whether existing policies adequately provide for the development of bicycle facilities.

City of West Des Moines Planning Documents

- Comprehensive Plan (2010)
- West Des Moines Citizen Survey (2012)
- City Code (Updated December 2011)
- Valley Junction Streetscape Plan (1999)
- Master Parks and Trails Plan (2014)

Des Moines Area Metropolitan Planning Organization (MPO) Planning Documents

- Year 2030 Long-Range Transportation Plan (2004)
- Horizon Year 2035 Long-Range Transportation Plan (2009)
- CONNECT: Central Iowa Bicycle and Pedestrian Transportation Action Plan 2020 (2009)

Other Regional Planning Documents

- Communication Master Plan for the Central Trails of Iowa (2006)

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[2] Jacobsen, Peter. (2003). *Safety in numbers: more walkers and bicyclists, safer walking and bicycling*. Injury Prevention;9:205-2.

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Chapter 3. User Needs Assessment

This chapter presents an overview of the needs of existing and potential bicyclists in West Des Moines. Adequately identifying user needs enables system planners and policy-makers to develop logical solutions for improving the community's bicycle and trail network.

The second part of this analysis uses reported crash data supplied by the City of West Des Moines for crashes involving pedestrians or bicyclists from 2009 through 2013. Analyzing crash data indicates streets or intersections that should be targeted for improvements. Increasing safety for pedestrians and bicyclists yields tremendous potential to increase the rate of non-motorized use (e.g., more people are willing to bicycle if they believe that it is a safe activity). Improving conditions at known problem sites is therefore a key element of this plan.

West Des Moines Citizen Survey 2012

The West Des Moines Citizen Survey was conducted to "assess citizen satisfaction with the delivery of major city services and to help determine priorities for the community as part of the City's ongoing planning process." The survey consisted of a random telephone survey to 400 households in the city.

Respondents were divided on their impressions of bicycling in the city – 52 percent responded 'very easy ' or 'easy', 15 percent responded 'difficult' or 'very difficult,' and 33 percent responded 'neither' or 'don't know'. However, three-quarters of respondents felt that it was important for West Des Moines to make it easier to travel by bicycle. Only seventeen percent felt that it is not important or not important at all to make travel by bicycle within the city easier (see Figure 8).

The second most important city service to emphasize as identified in this survey was management of traffic congestion.

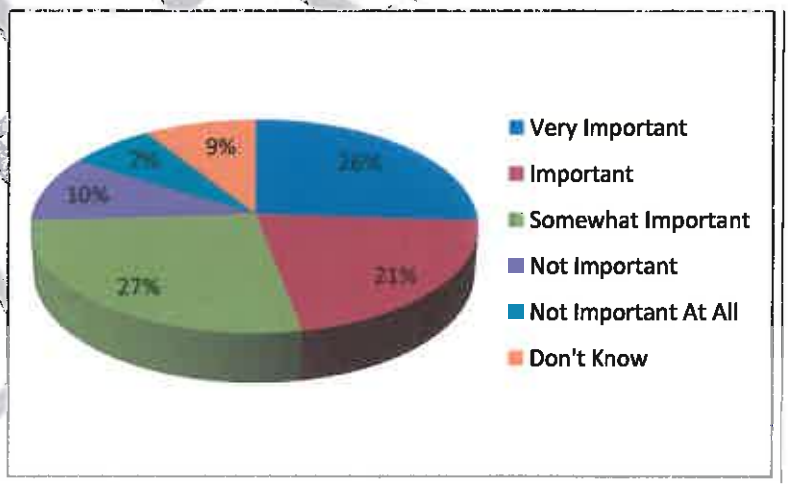

Figure 8. Importance of the City facilitating bicycling in West Des Moines.

Source: ETC Institute DirectionFinder (October 2012 - West Des Moines, IA)

Eighty-seven percent of respondents were 'satisfied' or 'very satisfied' with walking and biking trails in the city, while only four percent were dissatisfied. In addition, 80 percent of respondents were 'satisfied' or 'very satisfied' with accessibility

to desired destinations. Accessibility to desired destinations was ranked third in importance of Parks and Recreation services (of 18 offered categories), while walking and bicycling trails ranked second.

Residents living to the northeast in the city were generally less-satisfied with the number of quality greenway areas. Residents in the very far northeast corner were generally less-satisfied with the walking and hiking trails in their areas.

West Des Moines should use this survey to prioritize facilities in areas of the city that are underserved by bicycle facilities. The information from this survey provides an important baseline for future comparison. Conducting the survey every two years will provide useful benchmarking measures to allow West Des Moines to gauge the success of the plan. The 2010 and 2012 survey results provide a good baseline, which the City can use to gauge how perceptions change as this Master Plan is implemented.

Needs and Types of Bicyclists

It is important to understand that the needs and preferences of bicyclists vary depending on the cyclist's skill level and the type of trip a rider wishes to take. For example, bicyclists who ride for recreational purposes may prefer scenic, winding, off-street trails, while bicyclists who ride to work or for errands may prefer more direct on-street bicycle facilities. Likewise, fitness cyclists who put in 20-60 miles per ride prefer on-road facilities to connect them to their urban escape routes. Child bicyclists, seniors, and adults new to bicycling may prefer shared use paths, while adult bicyclists with more experience may prefer bicycle lanes. Cyclists also include utilitarian cyclists who choose to live with one fewer car and people who ride because they have no other transportation option due to economic reasons. A bicycle plan should consider these differences when planning a system that serves all user types. The following sections describe the different types of bicyclists, the different reasons for bicycling, and the respective needs of these categories of bicyclists.

Needs of Casual and Experienced Riders

For the purposes of this Plan, bicyclists are separated into two skill levels: casual and experienced. Casual bicyclists typically include youth, adults and seniors who are intermittent riders. Some casual bicyclists, such as youths under driving age, may be unfamiliar with operating a vehicle on roads and related laws. Experienced bicyclists typically include commuters, long-distance road bicyclists, racers, and those who use their bicycle as a primary means of transportation. Table summarizes the needs of casual and experienced bicyclists.

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Table 1. Characteristics of Casual and Experienced Bicyclists

Casual Riders	Experienced Riders
Prefer off-street shared use paths or bike lanes along low-volume, low-speed streets	Prefer on-street or bicycle-only facilities as opposed to shared use paths
May have difficulty gauging traffic and may be unfamiliar with the rules of the road. May walk bicycle across intersections	Comfortable riding with vehicles on streets. Negotiate streets like a motor vehicle, including "taking the lane" and using left-turn pockets
May use a less direct route to avoid Arterials with heavy traffic volumes	May prefer a more direct route
May ride on sidewalks and ride the wrong way on streets and sidewalks	Avoid riding on sidewalks or on shared use paths. Rides with the flow of traffic on streets
May ride at speeds comparable to walking, or slightly faster than walking	Ride at speeds up to 20 MPH on flat ground, up to 40 mph on steep descents
Bicycle for shorter distances: up to 2 miles	May cycle longer distances, sometimes more than 100 miles

The casual bicyclist will benefit from route markers, shared use paths, bike lanes on lower-volume streets, traffic calming, and educational programs. Casual bicyclists may also benefit from a connected network of marked routes leading to parks, schools, shopping areas, and other destinations. To encourage youth to ride, routes must be safe enough for their parents to allow them to ride. The experienced bicyclist will benefit from a connected network of bike lanes on higher-volume arterials, wider curb lanes and loop detectors at signals. The experienced bicyclist who is primarily interested in exercise will benefit from loop routes leading back to their point of origin. Due primarily to the existing trail network, the City of West Des Moines offers many opportunities for casual bicyclists. In several locations, the existing trails are accessible from residential neighborhoods. Many experienced bicyclists, including those who bicycle longer distances to commute for exercise or training, also use the trail system. This combination of fast-moving bicyclists on training rides with slower-moving casual bicyclists and pedestrians may result in user conflicts.

Characteristics of Recreational and Utilitarian Trips

For purposes of this Plan, bicycle trips are separated into two trip types: recreational and utilitarian. Recreational trips can range from a 50-mile weekend group ride along rural roads to a short family outing to a local park, and all levels in between. Many utilitarian trips are made by commuter bicyclists, who are a primary focus of State and Federal bicycle funding, as well as bicyclists going to school, shopping or running other errands. Utilitarian cyclists include those who choose to live with one less car as well as those who have no other alternative transportation due to economic reasons. Table summarizes general characteristics of recreational and utilitarian bicycle trips.

Table 2. Characteristics of Recreational and Utilitarian Bicycle Trips

Recreational Trips	Utilitarian Trips
Directness of route not as important as visual interest, shade, protection from wind	Directness of route and connected, continuous facilities more important than visual interest, etc.
Loop trips may be preferred to backtracking	Trips generally travel from residential to shopping or work areas and back
Trips may range from under a mile to over 50 miles	Trips generally are 1-5 miles in length
Short-term bicycle parking should be provided at recreational sites, parks, trailheads and other activity centers	Short-term and long-term bicycle parking should be provided at stores, transit stations, schools, workplaces
Varied topography may be desired, depending on the skill level of the cyclist	Flat topography is desired
Cyclists may be riding in a group	Cyclists often ride alone
Cyclists may drive with their bicycles to the starting point of a ride	Cyclists ride a bicycle as the primary transportation mode for the trip; may transfer to public transportation; may or may not have access to a car for the trip
Trips typically occur on the weekend or on weekdays before morning commute hours or after evening commute hours	Trips typically occur during morning and evening commute hours (commute to school and work); shopping trips also occur on weekends
Cyclists' preferred type of facility varies, depending on the skill level of the cyclist	Generally use on-street facilities, may use trails if they provide easier access to destinations than on-street facilities

Recreational bicyclists' needs vary depending on their skill level. Road bicyclists out for a 100-mile weekend ride may prefer well-maintained roads with wide shoulders and few intersections, with few stop signs or stop lights. Casual bicyclists out for a family trip may prefer a quiet shared use path with adjacent parks, benches, and water fountains.

West Des Moines's trail system provides excellent access to several parks, schools, and recreation areas. However, not all neighborhoods have easy bicycle access to employment centers, schools and shopping. For casual recreational riders, this may not be a serious deterrent, since they may be willing and able to drive their bicycle to the trailhead. However, this may not be an option for experienced recreational riders or commuters, as they generally would like to use their bicycle for the whole trip. Bicycle-friendly on-street connections between residential areas and the trails and between residential areas and shopping and commute centers would likely increase the prevalence of bicycle commuting, as well as increase the prevalence of recreational riding.

Safety Needs Analysis

Crash data can indicate areas that are difficult or dangerous for bicyclists, or where bicyclists may engage in unsafe behaviors, such as wrong-way riding. It can also highlight specific interactions

between bicyclists and motorists that require increased awareness or engineering. This section provides a summary of crash data involving bicycles and pedestrians provided by the city for 2005-2009. Pedestrians were included in this analysis due to the small number of bicycle and pedestrian crashes experienced in West Des Moines, and because bicyclists and pedestrians encounter similar safety concerns at intersections, including visibility when crossing in an intersection and potential collisions with turning vehicles. The following analysis identifies specific issues indicated by national crash data as well as common dangerous bicyclist behaviors, and recommends engineering and programmatic improvements to increase safety in West Des Moines.

West Des Moines Bicycle and Pedestrian Crash Data

Bicycle- and pedestrian-related crash data were collected for five years in West Des Moines, from 2009 through 2013. This data was provided by the West Des Moines Police Department. A crash is usually defined as "reportable" if the incident results in death or injury, or if property damage exceeds $1,000 for any single person's property and occurred between a cyclist and a motor vehicle.

Table 3. Crash Data, 2009-2013

Year	Month	Location	Mode Involved	Description*
2013	May	Grand Avenue at E.P.True Parkway	Bicyclist	Right hook, bicyclist on sidewalk
2013	July	Grand Avenue at 1800 Block	Pedestrian	Drive out, pedestrian on sidewalk
2013	July	4th Street at 200 Block	Bicyclist	Ride out, bicyclist in parking lot drive
2013	Aug	Railroad Avenue at 700 Block	Bicyclists	Drive out, bicyclists on sidewalk
2013	Sep	39th Street at 200 Block	Bicyclist	Drive out, bicyclist on street
2013	Sep	Ashworth Road at 900 Block	Bicyclist	Bicylist hit from rear
2012	Mar	Ashworth Road at 4400 Block	Bicyclist	Bicyclist hit from rear
2012	Apr	Walnut Street at 2nd Street	Bicyclist	Drive out, bicyclist on street
2012	May	University Avenue at 3000 Block	Pedestrian	Skateboarder hit from rear
2012	May	University Avenue at 92nd Street	Pedestrian	Ran in front of vehicle
2012	Aug	Grand Avenue at 1900 Block	Bicyclist	Drive out, bicycle on trail
2012	Aug	E.P.True Parkway at 68th Street	Bicyclist	Ride out, bicycle on sidewalk
2012	Oct	Valley West Drive at 1300 Block	Pedestrian	Drive out, pedestrian on sidewalk
2011	May	E.P.True Parkway at 60th Street	Pedestrian	Right hook, pedestrian on trail
2011	June	Railroad Avenue at Alley West of 6th Street	Bicyclist	Drive out, bicyclist on sidewalk
2011	June	42nd Street at University Avenue	Bicyclist	Ride out, bicyclist on sidewalk
2011	July	Walnut Street at 800 Block	Pedestrian	Lying in middle of street
2011	July	50th Street at Westown Parkway	Bicyclist	Right hook, bicyclist on trail
2011	Aug	Ashworth Road at 50th Street	Bicyclist	Bicyclist riding wrong way in street
2011	Oct	Westown Parkway at 60th Street	Bicyclist	Right hook, bicyclist on trail
2011	Dec	Woodland Avenue at Woodland Park Drive	Pedestrian	Unknown
2011	Dec	Grand Avenue at 14th Street	Bicyclist	Bicyclist hit from rear

Year	Month	Location	Mode Involved	Description*
2011	Dec	Westown Parkway at 3400 Block	Pedestrian	Ran out in front of vehicle
2010	April	Mills Civic Parkway at 5400 Block	Bicyclist	Drive out, bicyclist on trail
2010	June	Valley West Drive at E.P.True Parkway	Bicyclist	Ride out, bicyclist on sidewalk
2010	June	Ashworth Road at 16th Street	Pedestrian	Walking in middle of street
2010	June	Vine Street at 5th Street	Bicyclist	Ride out, bicyclist on sidewalk
2010	July	University Avenue at 22nd Street	Bicyclist	Right hook, bicyclist on sidewalk
2010	Aug	42nd Street at 1500 Block	Bicyclist	Drive out, bicyclist on sidewalk
2010	Oct	S. 50th Street at Fieldstone Drive	Bicyclist	Left hook, bicyclist on sidewalk
2010	Oct	Prospect Avenue at 8th Street	Pedestrian	Ran out in front of vehicle
2010	Nov	Grand Avenue at 1800 Block	Bicyclist	Drive out, bicyclist on sidewalk
2009	March	Grand Avenue at E.P.True Parkway	Bicyclist	Ride out, bicyclist on sidewalk
2009	July	Ashworth Road at Valley West Drive	Bicyclist	Ride out, bicyclist on sidewalk
2009	Sept	Railroad Avenue at 14th Street	Bicyclist	Ride out, bicyclist on sidewalk
2009	Nov	23rd Street at 800 Block	Pedestrian	Ran out mid-block
2009	Nov	EP True Parkway at Valley West Drive	Bicyclist	Right hook, bicyclist on sidewalk

* Crashes were categorized from police reports provided by the City of West Des Moines.

(1) Right Hook: A car passes a cyclist to the left of the cyclist and then makes a right turn in front of the cyclist. The cyclist is then either hit by the car or cannot avoid hitting the car. This type of accident occurs not only when a car is turning onto a road, but also into parking lots and driveways.

(2) Ride Out: Often called a "midblock rideout", this crash occurs soon after the bicyclist enters the roadway from a driveway, alley, or curb without slowing, stopping, or looking for traffic. The bicyclist's sudden entry leaves the motorist too little time to avoid a collision.

(3) Drive Out: This crash occurs when a motorist pulls into the path of a bicyclist, such as where a bike trail crosses a street intersection.

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Crash Location

The crash data provides an indication of where in West Des Moines people are bicycling and walking and where they may experience unclear guidance or dangerous conflicts. As the data indicates, most of the crashes occurred along major streets, particularly Grand Avenue, Ashworth Road, and EP True Parkway.

Most of the streets in Table 3 are busy with more than two lanes of traffic presenting complicated traffic patterns. In several of these locations, bicyclists are likely using these routes because alternatives do not exist and because they need to access destinations on these streets. Alternate routes can be provided on less busy streets, while a complimentary network of signage can direct cyclists to safer routes. While it may be desirable to provide bicycle facilities to encourage bicycle travel on less trafficked streets, key destinations such as stores, restaurants and employment sites are often located on busy streets. Thus, it is important to provide facilities to enable bicyclists to safely travel on streets with key destinations. Furthermore, bicyclists sometimes travel on busy streets because they prefer direct and fast routes to their destinations and/or because lower-traffic streets have many stop signs, which can slow bicyclist travel times as much as three times longer than another route. Finally, some busy streets do not have a lower volume parallel street that is better suited for bicycles due to a lack of street connectivity. For the above reasons, creating multi-modal streets may be a worthy goal for some of the busier streets in West Des Moines.

The majority of the vehicular crashes involving bicycles and pedestrians took place at an intersection. Measures to increase visibility of bicycles and pedestrians at intersections would increase safety for cyclists. Strategies for increasing bicycle visibility include colored bicycle boxes, which place bicycles in front of traffic to increase visibility at intersections and limit right-turn conflicts when the traffic signal changes from the red to the green phase. Colored paint can also be used to alert motorists to the presence of bicycles on intersection approaches. Complicated intersections should be simplified where possible. Where slip lanes allow drivers to make right turns without slowing, reconstructing the corners can significantly improve bicyclist and pedestrian safety (Figure 8).[3]

Figure 8. Reducing the radius of a turn reduces traffic speed and greatly improves safety for bicyclists and pedestrians.

[3] Consideration for emergency vehicles, truck traffic, and transit should be evaluated when reducing curb radii. Narrower turns require drivers to slow prior to making the turn, and should be considered where routes are used by schoolchildren or the elderly, in shopping areas, or on corners known to have safety issues.

Driveways are another conflict point for bicycles and automobiles. Consolidating breaks in the pavement for driveways (curb cuts) improves safety for bicycles traveling in a bike lane. Shortening the crossing distance is the key to providing safe crossings along trails. This can be done with curb extensions or median islands. In addition, high-visibility crossings can include flashing lights and signage to warn motorists that bicyclists and pedestrians are crossing.

Cause of Crash

The prevalence of crashes caused by 'right hooks' and 'ride outs' in the above table broadly indicates the need for additional awareness of bicyclists by motorists, as well as need for education for bicyclists about how to position themselves for maximum visibility and how to proceed safely.

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Chapter 4. Recommended Bicycle Network

West Des Moines has the potential to build on the existing bicycle and trail network and encourage walking and bicycling for transportation and recreation. This chapter lays out a long-range plan for completing this system of bikeways and trails. The recommended network builds upon previous and on-going local and regional planning efforts and reflects the extensive input offered by city staff, the Bicycle Master Plan Task Force, and West Des Moines residents.

The recommended bicycle network includes a comprehensive and diverse set of facilities connecting key destinations in and around West Des Moines. System improvements include expanding the on-street bikeway system with a variety of context-sensitive treatments. Suggested improvements include low-cost measures yielding immediate results, such as re-striping of streets to accommodate bike lanes, and other suggested improvements, such as providing bike lanes on certain newly constructed roads as identified in this plan, represent longer-term strategies for transforming West Des Moines into a truly bicycle-friendly community.

It should be noted that final bicycle facility design will be subject to relevant design guidelines depending on their location.

Key Principles for Bikeway Development

The following are key principles for these bicycle and trail guidelines

- **The bicycling and trail environment should be safe.** Bicycle routes, trails, and crossings should be designed and built to be free of hazards and to minimize conflicts with external factors such as noise, vehicular traffic and protruding architectural elements.
- **The bicycle and trail network should be accessible.** Bicycle routes, trails, and crosswalks should increase the mobility of all users by accommodating the needs of people regardless of age or ability. Bicyclists have a range of skill levels, and facilities should be designed for use by experienced cyclists at a minimum, with a goal of providing for inexperienced / recreational bicyclists (especially children and seniors) to the greatest extent possible. In areas where specific needs have been identified (e.g., near schools) the needs of appropriate types of bicyclists should be anticipated.
- **The bicycle and trail network should connect to places people want to go.** The bicycle and trail network should provide continuous, direct routes and convenient connections between destinations, including homes, schools, shopping areas, public services, recreational opportunities and transit.
- **The bicycling and trail environment should be clear and easy to use.** Bicycle facilities should be designed so people can easily find a direct route to a destination and delays are minimized. Most roads in West Des Moines are legal for use by bicyclists, meaning that most streets are bicycle facilities and should be designed, marked and maintained accordingly.
- **The bicycling and trail environment should be well designed.** Good design should enhance the feel of the bicycle and trail environment. A complete network of on-street bicycling facilities should connect seamlessly to the existing and proposed off-street pathways to complete recreational and commuting routes around the city.

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- **Bicycle and trail improvements should be economical.** Bicycle and trail improvements should be designed to achieve the maximum benefit for their cost, including initial cost and maintenance cost, as well as reduced reliance on more expensive modes of transportation. Where possible, improvements in the right-of-way should stimulate, reinforce and connect with adjacent private improvements.

Recommended Facility Types

Although West Des Moines currently lacks a comprehensive on-street bikeway network, the City has potential to create an excellent system. The recommended bicycle network builds upon the system of previously proposed improvements and connects to existing bikeways. The network has been developed to fill system gaps, formalize existing routes used by bicyclists, and improve access between residential, employment, civic, and commercial destinations.

Map following this discussion shows the recommended bikeway network for West Des Moines. Similar to today, shared use paths would form the region's future off-street bikeway system. Depending on their location and context, West Des Moines' proposed on-street bikeway network may include the following facilities:

- **Shoulder Bikeways:** Typically found in rural areas, shoulder bikeways are paved roadways with striped shoulders wide enough for bicycle travel (four feet or wider). There should be little or no parking allowed on the pavement when the shoulder is intended to be used as a bikeway. It is recommended that shoulder bikeways include signage (see the Manual on Traffic Control Devices [MUTCD] Section 9B.19 and 9B.20) alerting motorists to expect bicycle travel along the roadway.
- **Bike Lanes:** Designated exclusively for bicycle travel, bike lanes are separated from vehicle travel lanes with striping and also include pavement stencils and signing (see MUTCD Section 9B.04). Bike lanes are most appropriate on streets where higher traffic volumes and speeds indicate a need for greater separation.
- **Shared Lane Markings** are high-visibility pavement markings that help position bicyclists within a shared vehicle/bicycle travel lane (see MUTCD Section 9C.07). These markings are typically used on streets where dedicated bike lanes are desirable but are not possible due to physical or other constraints. Shared lane markings may be supplemented by signing (see MUTCD Section 9B.05).
- **Side Paths** are shared-use paths that can provide a desirable facility particularly for novice riders and cyclists of all skill levels preferring separation from traffic. Side paths are particularly appropriate where automobile speeds and volumes prohibit on-street accommodation of bicyclists.

Bikeway Facility Recommendations

Because a large portion of West Des Moines is built-out, retrofitting streets for bike lanes and other bicycle facilities can be challenging. However, providing bicycle facilities appropriate to the road classification facilitates comfortable cycling routes throughout the city. The bicycle facility type

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recommendations in this plan are based on road characteristics typical of different road classifications as identified in the Bicycle Facility Contextual Guidance chart in the NACTO Urban Bikeway Design Guide.

Any street that carries or is projected to carry over 20,000 vehicles per day is generally not recommended for shared lane markings or bike lanes. A buffered bike lane, cycle track, or side path should be considered. Streets that are being developed in the future have a greater ability to accommodate bicyclists from the initial construction. It is recommended that the local streets with high anticipated volumes and collector streets provide bike lanes according to the plan. The plan also indicates a few locations where both a side path and on-street bikeway be combined to enable cyclists of all abilities to travel.

Bike Lanes

Designated exclusively for bicycle travel, bike lanes are separated from vehicle travel lanes with striping and are also denoted by pavement stencils. Bike lanes are most appropriate on arterial and collector streets where higher vehicle traffic volumes and speeds warrant greater separation.

Most commuter bicyclists would argue that on-street bike lanes are the safest and most convenient facilities for bicycle transportation. Bicyclists have stated their preference for marked on-street bike lanes in numerous national surveys.[6] Many bicyclists, particularly less experienced riders, are more comfortable riding on a busy street if it has a striped and signed bike lane. The goals of this plan include providing safe and convenient bicycle access to the community and promoting overall safety awareness for bicyclists, and providing marked facilities such as bike lanes is one way of achieving these goals.

If properly designed, bike lanes can increase safety and promote proper riding. Bike lanes help to define the road space for bicyclists and motorists, reduce the chance that motorists will stray into the cyclists' path, discourage bicyclists from riding on the sidewalk or riding against traffic, and remind motorists that cyclists have a right to the road. One key consideration in designing bike lanes where parking is allowed in an urban setting is to provide adequate width and separation for bike lanes and adjacent parking lanes to allow cyclists enough room to avoid a suddenly opened vehicle door.

Retrofitting Existing Streets with Bike Lanes

Most major streets in West Des Moines are characterized by conditions (e.g., high vehicle speeds and/or volumes) which indicate that dedicated bike lanes may be appropriate to accommodate safe and comfortable riding. Although opportunities to add bike lanes through roadway widening may exist in some locations, most major streets in West Des Moines pose physical constraints that limit street retrofit measures to the existing curb-to-curb widths. As a result, striping modifications (lane narrowing, road diets, and occasionally parking reduction) to accommodate bike lanes may be considered for some streets if possible. Widening existing streets to add bike lanes would be expensive and difficult.

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[6] Landis, B.W., Vattikuti, V.R., Brannick, M.T. (2007). Real-Time Human Perceptions: Toward a Bicycle Level of Service. *Transportation Research Record* 1578.

To safely accommodate bicyclists on corridors with current or anticipated high vehicle traffic volumes, bike lanes are proposed on several major streets in West Des Moines. In developing the proposed bike lane network, consideration was given to several factors, including:

- Continuity and gaps in the existing bikeway system
- Previous and on-going planning efforts identifying the need for bike lanes on specific streets
- Planned street improvements that will or could include bike lanes as part of construction
- Whether an existing street could be retrofitted to include bike lanes
- Planned land development projects with the potential to increase bicycle travel demand

Depending on funding or other opportunities, bike lane project implementation could occur in multiple phases. When streets are reconstructed, side paths should be considered in conjunction with bike lanes on these streets. The redundancy of bicycle facilities on major streets allows both beginning and experienced riders travel on these streets safely and conveniently.

Shared Lane Markings

Shared lane markings are often used on streets where bike lanes are desirable but are not possible due to width constraints. High visibility pavement markings (MUTCD Section 9C.07) are placed in the travel lane to alert motorists of bicycle traffic, while also encouraging cyclists to ride at an appropriate distance from the "door zone" of adjacent parked cars. Placed in a linear pattern along a corridor, shared lane markings also encourage cyclists to ride in a straight line so their movements are predictable to motorists. These pavement markings have been successfully used in many small and large communities throughout the U.S.

Where sufficient right-of-way does not exist to develop bike lanes or where parking or travel lane narrowing or removal is not appropriate, bicycles can share the road with automobiles. Shared lane markings are not appropriate on streets with very high traffic speeds or a significant amount of truck traffic. Shared lane markings could be converted to bike lanes on these roadways (or nearby parallel routes) when conditions permit (i.e. when the street is undergoing construction).

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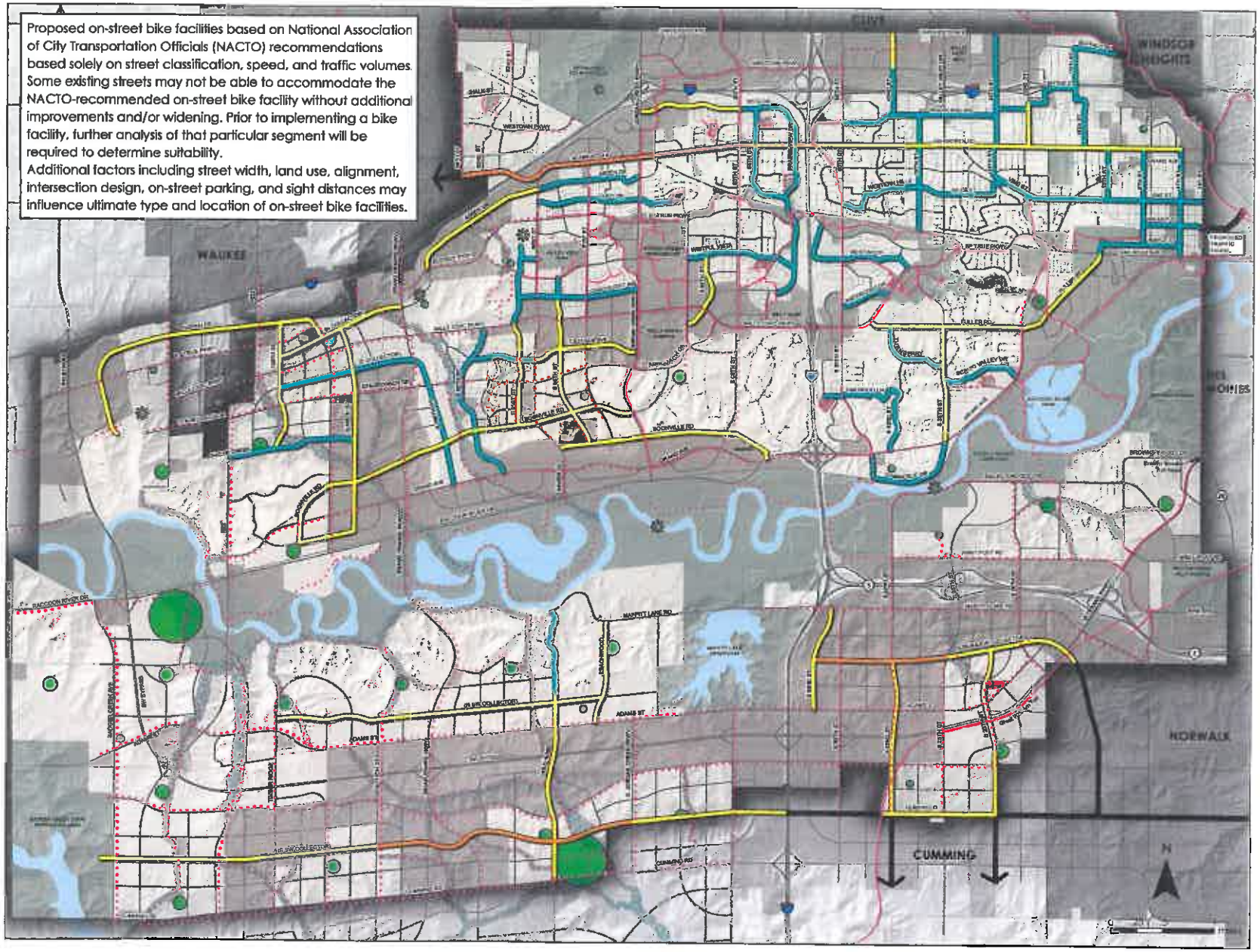
2015
ON-STREET BICYCLE FACILITY PLAN

West Des Moines, Iowa

Proposed on-street bike facilities based on National Association of City Transportation Officials (NACTO) recommendations based solely on street classification, speed, and traffic volumes. Some existing streets may not be able to accommodate the NACTO-recommended on-street bike facility without additional improvements and/or widening. Prior to implementing a bike facility, further analysis of that particular segment will be required to determine suitability.
Additional factors including street width, land use, alignment, intersection design, on-street parking, and sight distances may influence ultimate type and location of on-street bike facilities.



MAP LEGEND
- Existing Trail
- Proposed Trail
- Proposed Park
- Proposed Greenway
- Non-Residential Land Use
- Residential Land Use
- Open Space
- Further street alignment studies needed

BIKE FACILITY LEGEND
- Shared Lane Facility
- Bike Lane
- Buffered Bike Lane
- Outside Planning Area

THE CITY OF West Des Moines.

Source: City of West Des Moines
Author: maa
Date: May 2015

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Community-Wide Improvements

Supporting facilities encourage bicycle trips and improve comfort and usability of the physical network.

Bicycle Wayfinding Signing Plan

Landmarks, natural features, civic destinations, neighborhood business districts and other visual cues help residents and visitors navigate through West Des Moines. Placing signs throughout the city indicating to bicyclists their direction of travel, location of destinations, and the distance to those destinations will increase users' comfort and convenience of the bicycle system. Wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution.

Figure 9. Model MUTCD-Approved Wayfinding Signage.

Currently, West Des Moines does not have an adopted bikeway network. West Des Moines should adopt an on-street wayfinding signage in conformance with the MUTCD-approved sign shown in Figure 9 for use along bicycle facilities.

Signage can serve both wayfinding and safety purposes including:

- Helping to familiarize users with the bikeway system
- Helping users identify the best routes to destinations
- Helping to address misperceptions about travel time and distance
- Helping overcome a "barrier to entry" for people who do not bicycle often and who fear becoming lost

Wayfinding signs are a relatively cost-effective means for improving the walking and bicycling environment. Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes. Guidance for sign placement and height can be found in Chapter 4. Design Guidelines.

The City should create a community-wide Bicycle Wayfinding Signage Plan that identifies:

- Sign locations along existing and planned bicycle routes
- Sign type – what information should be included and what is the sign design
- Destinations to be highlighted on each sign – key destinations for bicyclists
- Approximate distance and riding time to each destination

Policy Recommendations

City policies greatly affect the City's ability to provide bicycle infrastructure and to support bicycling within the city.

City Code

City policies can be supportive of bicycling, such as ordinances allowing bicyclists to ride in the roadway where a bike lane or trail is full of debris, or they can deter bicycling, such as a requirement for wearing a helmet or bicycle licensing fees (both of which can discourage new bicyclists). Title 6, Chapter 11 of West Des Moines City Code outlines regulations about bicycling in the city. Following revisions made to the City Code in December of 2011, West Des Moines' policies are generally supportive of bicycling in the city.

Bike Parking Guidelines

Requirements for bicycle parking in West Des Moines are provided in Title 9: Zoning, Chapter 15: Off-Street Parking and Loading. Section 9-15-4: Off-Street Parking Regulations contains the following guidance:

> F. Provisions for Public Uses:
>
> > 1. Bicycle Parking: Public uses with more than fifty (50) required parking spaces shall provide a bicycle rack for the purpose of storing and protecting bicycles from theft. The minimum number of bicycle spaces required shall be one bicycle space per forty (40) parking spaces, up to a maximum of twenty (20) required bicycle spaces per use. Such devices shall be located in such a way as not to interfere with pedestrian or vehicular traffic.

West Des Moines should encourage private property owners to adopt bicycle parking requirements based on land uses. Sample bicycle parking requirements recommended by Association of Pedestrian and Bicycle Professionals (APBP) can be found in the 2010 *Bicycle Parking Guidelines*.

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Best Practices: Subdivision Design for Nonmotorized Transportation

Current subdivision design in the U.S. promotes the almost exclusive use of the automobile. Residential subdivision streets are wide, non-linear and may or may not provide sidewalks. Most homeowners have ample room to park in their garages or on their driveways and as such, there is little on-street parking. The use of cul-de-sacs and one-way streets in and out of the subdivision create overloaded arterial streets that are not friendly to nonmotorized travel, nor convenient for direct-access travel.

Retrofitting existing suburban neighborhoods to make them more bicycle and pedestrian friendly is often more politically difficult than physically difficult. Design solutions include a number of options:

- Adding sidewalks
- Adding curb-cuts
- Adding crosswalks
- Creating bike/parking lanes with striping
- Creating public access connectors between cul-de-sacs and adjacent streets
- Narrowing the streets (through a variety of techniques) to slow traffic and increase safety for non-motorized users

New subdivision design should include the following criteria as a minimum:

- Grid street pattern wherever possible, with multiple intersections to provide ample opportunity for connection
- Public right-of-way connections for bicyclists and pedestrians between cul-de-sacs and adjacent streets
- Minimum of four-foot sidewalks on both sides of the street
- Shorter street blocks
- Proximity or creation of neighborhood amenities such as parks, shops, schools, etc.

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Chapter 5. Recommended Programs: Education, Enforcement, Encouragement, & Evaluation

This chapter describes the existing resources, activities, and opportunities related to bicycle education and outreach in West Des Moines, and presents a menu of possible future and expanded encouragement and education programs for bicycling.

Existing efforts

Available Maps and Materials

Greater Des Moines Regional Trails Map

- Web map: http://www.dsmbikecollective.org

Central Iowa Trails Map

- Web map: http://www.dsmbikecollective.org

City of West Des Moines Parks & Trails Map

- Web map: http://www.wdm.iowa.gov

Iowa by Trails App

- Developed by the Iowa Natural Heritage Foundation. Available in the iTunes Store.

Existing Committees, Clubs, Organizations, and Teams

- **The Iowa Bicycle Coalition** is a non-profit organization that promotes safe and enjoyable bicycling for transportation and recreation in the state of Iowa. The group works on Safe Routes to School programs by providing training and support to schools on encouragement and education programs. The Coalition also hosts an annual education conference geared towards transportation officials, safety education, and encouragement activities such as Bike to Work Week
- **Bicycle/Pedestrian Round Table:** The Des Moines Area Metropolitan Planning Organization (MPO) organizes a bicycle round table for agency representatives and community members to discuss bicycling issues. West Des Moines currently has a staff representative at the round table.
- **The School Safety Committee**, composed of representatives from schools, the Police Department, Public Works, and the general public, meets to address safety issues at West Des Moines and Waukee schools. The group has applied for grant opportunities to directly address issues, but has not yet been successful in having grant monies awarded to them.

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Existing Events and Campaigns

- **Bicycling Education and Recreational Bicycling Programs:** Bicycle classes and programs are regularly offered by the Parks and Recreation Department to encourage families to bicycle.
- **Mayor's Bike Ride:** The City of West Des Moines held the first Mayor's Bike Ride in September of 2014 and the second in May of 2015.
- **Bike Month and Bike to Work Week:** The City of West Des Moines participates in Bike Month and Bike to Work Week activities annually.
- **Bike Safety Clinic and Helmet Giveaway:** The Emergency Medical Services Department hosts a bike safety clinic on trails in West Des Moines, providing bicycle safety education and distributing free helmets.
- **Youth Traffic Safety Education/Safetytown:** West Des Moines schools teach incoming kindergarteners traffic safety education by having the children learn skills in "Safetytown," a mock city with streets, traffic signals, other features, set up outside on a playing court.
- **Bike Racks on all DART buses:** Bike racks are provided on all Des Moines area buses.
- **Hyvee Kids Triathlon and Flatland Kids Triathlon:** Held annually at Raccoon River Park these events attract both amateur and elite youth athletes from across the country.

Menu of Programs

The following section presents a menu of possible programs for implementation in West Des Moines to encourage bicycling and educate the public about bicycling. Each program recommendation includes the purpose, audience, a description of the program, and sample program with a link if applicable.

The Bicycle Advisory Commission (BAC) oversees bicycle-related programs and events specific to West Des Moines The Education and Encouragement Committee of the BAC provides guidance and feedback to City staff.

Encouragement Programs

Family Biking Programs

- Purpose: Encourage and educate parents about how to bicycle with children; educating children about how to bicycle
- Audience: Parents and families

Family bicycling programs help parents figure out how to safely transport children by bicycle and help children learn bicycling skills. The format can vary. Some events are panel discussions; others are an open-house style event (e.g. at a park), while others may be a class.

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Family biking program activities may include:

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

Figure 10. Family biking programs provide families with bicycling skills, tools for transporting small children, and fun activities to do as a family.

Sample Program:

- San Francisco Bicycle Coalition's Family DayThis annual event, held in Golden Gate Park, includes a bike rodeo, a "freedom from training wheels" training, family bike games and safety clinic, a family biking showcase with vendors and equipment, bike scavenger hunt, a basic bike maintenance workshop, and a family bike parade.
  More information: http://www.sfbike.org/family_day

Senior Bicycling Programs

- Purpose: Encourage and educate seniors about bicycling
- Audience: Seniors

Seniors often experience limitations in mobility as they age. Senior programs designed to increase walking and bicycling can help seniors maintain independence and mobility, improve health, and provide an opportunity for social interaction. A senior walking and bicycling program may include any of the following components:

- Group bicycle rides
- Providing comfort bicycles and/or adult tricycles that are easy for seniors to use in light of balance, strength, or comfort issues

Figure 11. The City of Portland, Oregon produces maps of suggested walking routes from Senior Centers.

(Source: http://www.portlandonline.com/)

- Bicycling maps at senior centers
- Senior participation in Safe Routes to Schools (e.g. crossing guard or Walking School Bus volunteer)
- Targeted infrastructure investments aimed at senior mobility problems
- Policy and traffic operations changes to assist seniors, such as increased walk cycle time and Leading Pedestrian Intervals (LPIs) that allow pedestrians to begin crossing before other traffic proceeds

Sample Programs:

- Portland Safe Routes to Senior Centers Program:
  http://www.portlandonline.com/TRANSPORTATION/index.cfm?c=eafeg
  http://www.streetfilms.org/archives/portland-or-older-adults-bike-program/ (video)
- Transportation Alternatives' Safe Routes for Seniors Program:
  http://www.transalt.org/campaigns/pedestrian/safeseniors

Safe Routes to School

- Purpose: Encourage and educate students and their parents about walking and biking to school; improve safety through physical improvements and programs
- Audience: School-aged children and their parents; School administrators, faculty, and staff

Figure 12. Safe Routes to School programs improve conditions for walking and bicycling near schools and in surrounding neighborhoods.

Safe Routes to School programs use a "5 Es" approach using Engineering, Education, Enforcement, Encouragement, and Evaluation strategies to improve safety and encourage children walking and biking to school. The programs are usually run by a coalition of city government, school and school district officials and teachers, parents and students, and neighbors.

Update Biking Maps

- Purpose: Encourage biking by providing route and facility information and highlighting bicycling destinations
- Audience: General public

One of the most effective ways of encouraging people to bike is through the use of maps and guides to show that the infrastructure exists, to demonstrate how easy it is to access different parts of the city by bike, and to highlight unique areas, shopping districts or recreational areas. Maps can be city-, district-, or neighborhood-specific and can be printed or made available online as interactive maps.

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Maps currently exist for Greater Des Moines trails and regional trails, but the existing city bike map should be updated as the on-street bicycle facilities in this Bicycle Master Plan are implemented. The updated map can help commuters and bicyclists wishing to bike on streets with suggested routes.

Sample Maps:

- NYC online map: http://www.nycbikemaps.com/maps/manhattan-bike-map/
- City of Portland maps: http://www.portlandoregon.gov

One-stop Bicycling Website

- Purpose: Encourage bicycling by providing comprehensive information in one location
- Audience: Existing and potential bicyclists

West Des Moines already has numerous resources for bicyclists, but many bicyclists or potential bicyclists do not know where to turn to find out about laws, events, maps, tips, and biking groups. West Des Moines should develop a "one-stop shopping" webpage aimed at bicyclists containing city specific information and links to other websites.

The webpage information or links could contain:

- A list of all bicycling groups, including clubs, racing teams, and advocacy groups
- Information about specific committees and groups that discuss bicycle issues (including how to get involved, meeting times and dates, agendas and minutes)
- Information about current projects and how to get involved
- Maps and brochures with popular riding routes
- Links to laws and statutes relating to walking and bicycling
- Information about bicycling events
- A list of local bike shops, including phone number and address
- Relevant phone numbers (e.g., contact numbers to request pothole repair, parking enforcement, bike rack installation request, trail maintenance, etc.)
- Message boards and/or a blog featuring stories and news

Sample Program:

- Vélo Québec website, http://www.velo.qc.ca/english/index.php

Launch Party for New Bikeways

- Purpose: Inform residents about new bicycle facilities to encourage use
- Audience: Residents living near a newly-completed bicycle facility

When a new bicycle facility is built, some residents will become aware of it and use it, but others may not realize that they have improved bicycling options available to them. A launch party/campaign is a good way to inform residents about a new bikeway, and can also be an opportunity to share other bicycling information (such as maps and brochures) and answer resident questions about bicycling. It should also be a media-friendly event, with elected official appearances, ribbon cuttings, and a press

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release that includes information about the new bikeway, other bicycle facilities, and any timely information about bicycling (such as Bicycle Friendly Community designation, any increase in bicycle mode share or user counts, etc.).

Sample Program:

- When a new bikeway is built, the City of Vancouver throws a neighborhood party to celebrate. Cake, t-shirts, media and festivities are provided and all neighbors are invited as well as city workers (engineers, construction staff, and planners) who worked on it.

Bike to Health Campaign

- Purpose: Encourage healthy lifestyles through making choices such as bicycling for transportation and recreation
- Audience: General public

Many cities around the country are implementing health marketing campaigns to encourage healthy and active lifestyles. Obesity and sedentary lifestyles are on the rise for both adults and children in America, and daily exercise needs to be integrated into American lifestyles. A Bike to Health marketing campaign adds support to existing media messages of improving diet and getting more exercise.

Sample Program:

- Find thirty. It's not a big exercise® is a marketing campaign aimed at increasing moderate-intensity physical activity in Australians' daily lives The target audiences to receive information on the benefits of a healthy lifestyle are adults and health professionals. The Find thirty® campaign uses a regularly updated website, television advertisements, and events to promote their cause of increasing daily exercise.
  More information: http://www.findthirty.com.au/

Summer Streets Event

- Purpose: Encourage walking and biking by providing a car-free street event
- Audience: General public, generally within a particular community but can be promoted city wide

Figure 13. Summer Streets events are a fun opportunity for theneighborhood to come together around walking and bicycling.

These programs have many names: Summer Streets, Sunday Parkways, Ciclovias, Sunday Streets. Summer Streets are periodic street closures (usually on Sundays) that create a temporary park that is open to the public for walking, bicycling, dancing, hula hooping, roller skating, etc. They have been very successful internationally and are rapidly becoming popular

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in the United States. They promote health by creating a safe and attractive space for physical activity and social contact, and are cost-effective compared to the cost of building new parks for the same purpose. These events can be weekly events or one-time events, and are generally very popular and well-attended.

Sample Programs:

- New York City Summer Streets:
  http://www.nyc.gov/html/dot/summerstreets/html/home/home.shtml
  http://www.streetsblog.org/2008/08/11/streetfilms-summer-streets-2008/ (video)
- Portland Sunday Parkways:
  http://www.portlandonline.com/Transportation/index.cfm?c=46103
  http://www.streetfilms.org/portlands-sunday-parkways/ (video)

Education Programs

Youth Bike Safety Education

- Purpose: Educate school-aged children on safe bicycling skills and rules of the road; encourage bicycling among children
- Audience: Youth

Typical school-based bicycle education programs educate students about the rules of the road, proper use of bicycle equipment, biking skills, street crossing skills, and the benefits of biking. Education programs can be part of a Safe Routes to School program. These types of education programs are usually sponsored by a joint City/school district committee that includes appointed parents, teachers, student representatives, administrators, police, active bicyclists and engineering department staff.

Figure 14. Youth Bike Safety Education instructs students how to signal, where to ride, and other best practices for cycling.

Sample Programs:

- League of American Bicyclists:
  http://www.bikeleague.org
- Bicycle Transportation Alliance – Portland, OR:
  http://www.btaoregon.org

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Cycling Skills Courses

- Purpose: Educate older children and adults on safe bicycling skills; encourage bicycling
- Audience: General public

Figure 15. Adult cycling skills education also addresses equipment and maintenance.

Most cyclists do not receive any training on safe cycling practices, the rules of the road and bicycle handling skills. Cycling skills courses can address this education gap. The most common program is the League of American Bicyclists courses (including Road I, Road II, and Commuting), taught by League Certified Instructors. Courses cover bicycle safety checks, fixing a flat, on-bike skills, crash avoidance techniques, and traffic negotiation.

Sample Programs:

- CAN-bike, Canada:

  http://www.toronto.ca/cycling/canbike/canbike.htm
- League of American Bicyclists, USA: http://bikeleague.org
  http://www.wordspacepress.com/instructor.php

Driver Education

- Purpose: Educate motorists on bicyclist road rules and responsibilities
- Audience: Motorists

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

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Police Education

- Purpose: Educate law enforcement officers on bicycle laws and safety
- Audience: Police officers

Figure 16. Local law enforcement is often involved with Safe Routes to School efforts.

Many law enforcement professionals do not receive training specific to bicycle laws, handling, or safety. Police education courses or training can help officers improve public safety and enforce existing laws more effectively by providing them with the training they need. These trainings should include comprehensive information about: laws and statutes pertaining to bicycling, common crash types and causes, and how to prevent and enforce against the most serious offences. They train officers about options for enforcement and education (e.g. when a citation vs. warning should be issued, diversion class options, and safety materials that can be handed out at a traffic stop or public event).

Sample program:

- Chicago Bicycle Program, Traffic Enforcement for Bicycle Safety Video
  More information: www.chicagobikes.org/video/index.php?loadVideo=police_training_2009

Share the Path Campaign

- Purpose: Encourage responsible, respectful behavior by path users
- Audience: Users of shared-use paths

Figure 17. Share the Path Campaign remind path users to ride safely.

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

Sample programs:

- Share the Path (Portland, OR): http://www.btaoregon.org

SafetyCampaign

- Purpose: Creating awareness of bicycling and promote safety
- Audience: General public

Figure 18. In order to be most effective, a safety campaign should be simple, yet memorable.

A marketing campaign that highlights bicyclist and pedestrian safety is an important part of creating awareness. It is an effective way to reach the general public and reinforce other education and outreach messages. A well-produced safety campaign will be memorable and effective.

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Chapter 6. Project Prioritization

The West Des Moines Bicycle Master Plan allows the City to focus and prioritize implementation efforts where they will provide the greatest community benefit. This prioritization should be performed by the Bicycle Advisory Commission on an annual basis in conjunction with the City's budget process. This chapter describes the methodology used for prioritizing West Des Moines' recommended bikeway projects and programs.

Infrastructure Project Evaluation

The Steering Committee for the original Bicycle Master Plan developed several evaluation criteria to identify and prioritize the proposed bicycle and trail improvement projects. This approach should be used to gauge the relative importance of each proposed bikeway project, which will inform funding allocation for implementation of this Master Plan. The criteria should be applied in two ways:

- To lay out the best possible future bicycle and trail network by identifying the features of a network most important to West Des Moines residents
- To rank projects against each other as an indication of their relative importance

Table 4 lists the evaluation criteria that can be used to prioritize potential projects. Short-, medium-, and long-term priorities may change according to available funds, new roadway projects, new development and redevelopment opportunities, or other factors.

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Table 4. Infrastructure Project Evaluation Criteria

Criteria	Measurement
System Connectivity/ Overcomes a Barriers	To what degree does the project fill a missing gap in the bicycle system?
Land Uses/Use Generators	Does the project provide connectivity to key destinations, including schools, parks, employment, commercial centers, and civic centers?
Appealing to a Wide Range of Bicyclists	Does the project provide a route that would be comfortable for novice cyclists?
Regional Benefit	To what degree does the project benefit the region by increasing connectivity to surrounding communities, or other regional bikeways or trails?
Community Support	To what degree do West Des Moines residents desire the proposed project? This criterion takes into account oral and written feedback received at the community workshops and through workshop questionnaires as well as previously-proposed bicycle and trail projects.
Cost	What financial resources are needed to implement the project? Is the project cost prohibitive, or can it be implemented through grant funding or other opportunities?
Ease of Implementation	How difficult will it be to implement the project? This criterion takes into account constraints like existing development, presence or lack of available right-of-way, and environmental and political issues.

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Chapter 7. Implementation Plan

As described in Chapters 4 and 5, West Des Moines' recommended bicycle and trail system consists of a comprehensive network of on-street bikeways of all types. This chapter presents an implementation strategy that is a targeted methodology for how West Des Moines can implement the recommended projects and programs. Grant funding sources are identified at federal, state and local levels.

Implementation Policies

The West Des Moines Bicycle Master Plan provides the long-term vision for the development of a community-wide bikeway network usable by all residents for all trip purposes. Implementation of the plan will take place over many years. The following strategies and action items are provided to guide West Des Moines toward the vision identified in the plan.

Strategy 1: Strategically Pursue Infrastructure Projects

City of West Des Moines staff should strategically pursue infrastructure projects. Ideally, staff should pursue capital improvement funding and grant funding, as well as incorporating projects into upcoming public works projects for short-term bicycle improvements first. However, if promising grant programs are identified or construction of another roadway project makes construction of a lower priority project possible, then the community should pursue that project regardless of priority.

Policies:

At the end of each fiscal year, West Des Moines should publish a public report documenting the status and on-going actions for all bicycle projects. This report may be combined with the prioritization review discussed below.

Policy 1.1 Pursue capital improvements funding or grant funding for higher-priority bicycle improvements first.

Policy 1.2 In the case where grant requirements or construction in conjunction with another roadway project make completion of a lower priority project possible or required by law, pursue funding sources for that project regardless of priority.

Policy 1.3 Install approved bicycle projects simultaneously with road improvement projects scheduled in the same area, regardless of the priority placed upon the bicycle project.

Policy 1.4 Publish a public report documenting the status and on-going actions for all bicycle projects at the end of each fiscal year.

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Strategy 2: Regularly Revisit Project Prioritization

Projects have been prioritized based on system connectivity, overcoming barriers, community support, and other criteria described in Chapter 7. This list should be reviewed by the Bicycle Advisory Commission every fiscal year, with new projects added, completed projects removed, and the priorities revised as conditions change. This strategy also represents an opportunity to collaborate with nearby jurisdictions on regionally-important bikeways.

Policies:

Annually review and update the bikeway project list with input from the City of Des Moines, Polk, Dallas, Madison, and Warren Counties, and other relevant agency staff. The updated list should be made available to the public.

Policy 2.1 Annually review and update the West Des Moines Bicycle Master Plan project and program list.

Policy 2.2 Share updated West Des Moines Bicycle Master Plan project list with the public and other jurisdictions, including Polk, Dallas, and Warren Counties and the City of Des Moines.

Policy 2.3 Review and update the plan as needed, at a minimum of every five years.

Strategy 3: Integrate Bicycle Planning into West Des Moines' Planning Processes

This plan presents a vision for the future of bicycling in West Des Moines. To ensure that that vision is implemented, the plan must become a living document that is incorporated into the day-to-day activities of planning, design, funding, construction, and maintenance in West Des Moines. This plan recommends several ways for bicycle planning to be integrated into the planning process.

Policies:

Policy 3.1 Incorporate a bicycle facilities checklist into the plan review process.

Policy 3.2 Adopt a bicycle parking ordinance that establishes guidelines for bicycle parking linked to land uses.

Policy 3.3 Implement the Complete Streets policy and consider all modes and types of users in new construction and reconstruction of road and bridge projects. Bicycle and trail facilities should be addressed at the project scoping stage.

Policy 3.4 Require sufficient right-of-way to be set aside for bicycle and trail facilities as redevelopment projects occur.

Policy 3.5 Ensure that appropriate bicycle and trail facilities are built in new developments in accordance with this plan and other relevant plans.

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Strategy 4: Encourage Private Donors to Support the Bikeway/Trail System

Many trails have a "Friends of" group that can provide volunteer construction and maintenance services as well as funding small projects, such as signage and wayfinding programs. Through such a program, or an "Adopt a Bikeway" program, corporations, institutions, and individual private donors can support the existing and proposed bikeway and shared-use path system. This program can be leveraged to enhance maintenance through volunteer work and can connect philanthropy with fundraising to sustain the system.

Policies:

Policy 4.1 Encourage corporations, institutions and individual private donors to support the existing and proposed bikeway/trail system.

Policy 4.2 Leverage this program to enhance maintenance through volunteer work, and connect philanthropy with fundraising to sustain the system.

Policy 4.3 Evaluate opportunities for establishing a philanthropic giving program that can be used to support the construction and maintenance of West Des Moines' bikeways and trails.

Strategy 5: Implement Education, Encouragement and Enforcement Activities

The City should augment the expanded bicycle network with education, encouragement, and enforcement activities to encourage more walking and cycling among West Des Moines residents. These supporting programs are critical to the success of the plan and have been prioritized based on cost and ease of implementation.

Policies:

Policy 5.1 Pursue grant funding for higher-priority programs first.

Policy 5.2 Seek funding for other supporting programs as appropriate.

Policy 5.3 Work with schools, youth groups, and other parties to provide education and encouragement programs to West Des Moines residents.

Policy 5.4 Work with the Police Department, media, advocacy and safety groups to create an educational program to educate pedestrians, bicyclists, and drivers on rights, responsibilities and safe practices to share the road comfortably and safely.

Cost Opinions

This section summarizes planning level cost opinions associated with the recommended bicycle improvement projects. Cost opinions were provided by City staff. Table 5 shows cost opinions for elements of bicycle improvement projects.

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*Table 5. Unit Costs for Bicycle Improvements**

Facility Type	Cost Per Mile	Annualized On-Going Costs†	Notes
Signed Route	$2,160	-	Signs every 600'
Shared Lane Marking on Minor or Major Collector	$3,100	$5,100	Signs every 600'; shared lane markings every 250'
Bike Lane (10')	$1,000,000	$19,000	Signs every 600'; bike lane marking every 250'; 4" lane striping; 10' additional ROW; 10' additional pavement
Bike Lane (12')	$1,200,000	$19,000	Signs every 600'; bike lane marking every 250'; 4" lane striping; 12' additional ROW; 12' additional pavement
Buffered Bike Lane	$1,600,000	$57,000	Signs every 600'; bike lane marking every 250'; 4" lane striping; diagonal striping in buffer area; 16' additional ROW; 16' additional pavement

* Costs include engineering, contingency, and design allowances.

† Annualized costs assume repainting stripes and pavement markings twice per year.

Maintenance Costs

On-street bikeways and trails require regular maintenance and repair as previously discussed in Chapter 5. On-street bikeways are typically maintained as part of standard roadway maintenance programs, and extra emphasis should be placed on keeping bike lanes and roadway shoulders clear of debris and keeping vegetation overgrowth from blocking visibility or creeping into the roadway.

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Conclusions

West Des Moines has the foundations of a great bikeway system already in place. However, a lack of on-street bicycle facilities, combined with concerns about traveling on and crossing major streets are significant barriers to bicycling in the city; only 0.03 percent of residents currently bicycle to work (American Community Survey, 2009). To improve safety and develop a comprehensive bicycle network, the City can begin filling gaps in the off-street network and provide on-street connections to key destinations, including schools, parks, and community, employment, and transit centers. Programs to encourage bicycling will increase the numbers of cyclists, improving visibility and raising awareness of bicycling as a viable mode of everyday transportation.

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