

The Bikeable-Walkable Community Plan For the City of Washington, Missouri



Trailnet, Inc.

in Association with James Pona & Associates, LLC,
and Southwestern Illinois RC&D

Final Draft, July 21, 2011

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Introduction

The planning process for the City of Washington’s Bikeable-Walkable Community Plan was initiated in the fall of 2009 by a consultant team working in close coordination with the city’s Planning and Parks and Recreation Departments. Local project oversight was provided by Darren Lamb, AICP, Director of Economic Development (former City Planner) who guided the study effort and coordinated its progress with the city. Numerous meetings were held during the study period to discuss issues and needs. Briefings were also provided to the City Council, the Planning Commission and the Parks Commission.

Washington was one of the first cities in the St. Louis Region to have developed a bicycle facilities plan and to have subsequently constructed bikeways. The present effort represents the city’s second generation of bicycle and pedestrian facility planning and development. Washington’s existing Rotary Riverfront Trail is heavily used and there has been strong interest in expanding the system for both recreation and transportation purposes. Consequently, this study examined and analyzed existing conditions relative to bicycling and walking throughout the city and formulated a new bikeable-walkable community plan to address the demand.

During the course of work, the planning team received input from many citizens, officials and community leaders. The team also conducted extensive field reconnaissance and analyzed conditions on city streets, as well as in business corridors and existing parks. It also examined the potential for new facilities along stream corridors and, significantly, a direct connection to the Katy Trail.

A public forum was held on September 10, 2009 during the data collection/analysis phase at which there was detailed discussion on local needs. A second forum was held on June 1, 2010 to present the draft plan and to solicit feedback on plan recommendations.



September 10, 2009 Public Forum

Upon official adoption by the city, this plan will become a guide for an expanded system of interconnected trails and on-street bicycle facilities – for recreation, transportation and tourism. It will be implemented over a period of time as funding opportunities for particular segments coalesce. The city will minimize demands on local funds through grants and other outside assistance. The anticipated implementation horizon is ten years.

The study team would like to thank the following individuals for their guidance and input, both direct and indirect, in the formulation of this plan, as well as all of the citizens who provided comments and suggestions:

Elected Officials:

- Hon. Sandy Lucy, Mayor and Ward I Alderman
- Hon. Richard Stratman, Former Mayor
- Hon. Steve Sullentrup, Alderman, Ward I
- Hon. Walter Mohesky, Alderman, Ward II
- Hon. Mark Hidritch, Alderman, Ward II
- Hon. Connie Groff, Alderman, Ward III
- Hon. Tim Brinker, Alderman, Ward III
- Hon. Carolyn Witt, Alderman, Ward IV
- Hon. Joe Holtmeier, Alderman, Ward IV

Park Board:

- Bill Kackley
- Bob Kloeppe
- Walt Luther
- Karen Maniaci
- Steve Ruether
- Tessie Steffens
- Sparky Stuckenschneider
- Debbie Toedebusch
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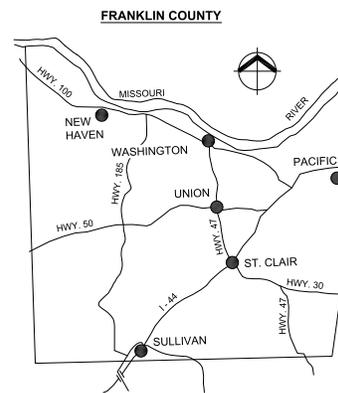
I. Existing Conditions and Analysis

The purpose of this study is to examine the potential for bicycling and walking to function as transportation and recreation modes in the everyday lives of residents of the City of Washington, Missouri. Although it focuses primarily on areas within and close to the city, it will also examine the potential for interconnections with similar initiatives both in Franklin County and in some other local jurisdictions. In addition, the study builds on the city's earlier work in the planning and development of bicycle facilities.

The first chapter of the report provides a description and analysis of existing conditions within the city, in preparation for the creation of a new bicycle and pedestrian facilities plan in the next chapter. It begins with a review and assessment of selected demographic and socio-economic data in the city that relates to pedestrian and cycling activity. It also examines parks, open space, the public right-of-way and other public/quasi-public corridors, and explores concepts for potential incorporation into the plan that will comprise the next phase of work.

A. Existing Socio-Economic Factors

This section of the Washington Missouri Bikeable-Walkable planning study analyzes population changes, age groups, median household income, educational attainment and journey to work in the City of Washington and compares and contrasts the data with other Franklin County cities including New Haven, Pacific, St. Clair, Sullivan and Union. These are the largest cities in the County and all have a population of over 4,000 (see map, Figure 1). The analysis provides insights into the potential for a system of bikeable-walkable routes within the city.



1. Washington in context with surrounding communities.

1. Population Growth

The preparation of a bikeable-walkable plan for Washington should take into consideration the future growth of population. For this study, U.S. Census data from 1990 and 2000 was primarily used, supplemented with new data from the U.S. Census Bureau’s American Community Survey (ACS), which provides detailed multi-year population estimates between decennial census counts. The ACS calculates a multi-year rolling population average for communities based on estimates calculated annually between each decennial census. In this case, the rolling average population between 2005 and 2009 was used for Washington and its sister cities in Franklin County. This approach provides the most complete post-2000 information across a variety of demographic categories. (Refer to Figures 2 and 3.)

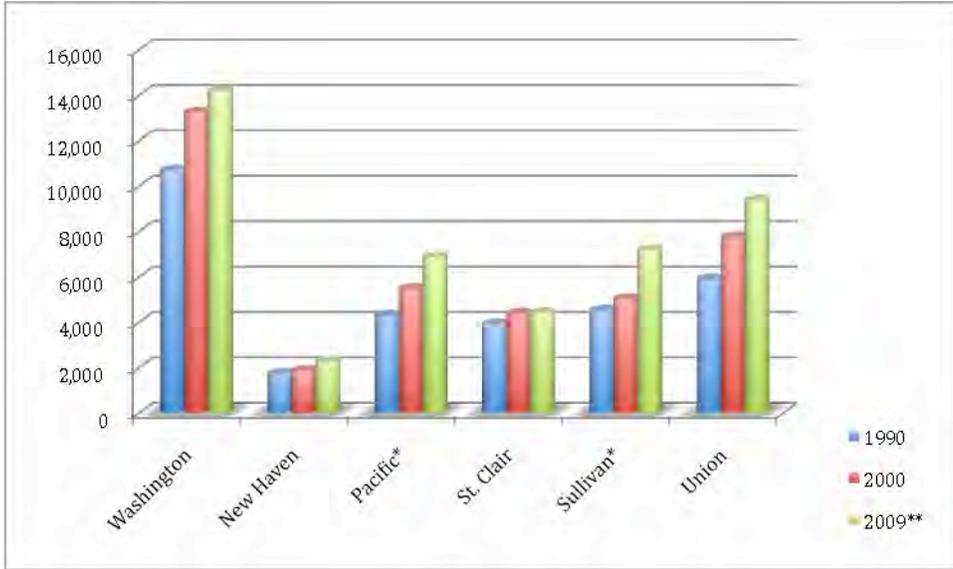
2. Population Change in Washington and its Neighboring Cities, 1990-2009

City	1990	2000	Change 1990-2000	Percent Change 1990-2000	2005- 2009 Avg. (1)	Change 2005- 2009	Percent Change 2005- 2009
Washington	10,704	13,243	2,539	23.7%	14,179	936	7.1%
New Haven	1,737	1,867	130	7.5%	2,269	402	21.6%
Pacific *	4,306	5,482	1,176	27.3%	6,873	1,391	25.4%
St. Clair	3,932	4,390	458	11.6%	4,417	27	.6%
Sullivan *	4,526	5,025	499	11.0%	7,177	2,152	43.0%
Union	5,909	7,757	1,848	31.3%	9,369	1,612	21.0%

1. Source: American Community Survey Population Estimate for the period 2005-2009. U.S. Census

* Portion within Franklin County only

3. Population Change in Washington and Surrounding Cities, Shown Graphically



Source: American Community Survey (ACS), 2005-2009

Although its rate of growth slowed after 2000, Washington still experienced a substantial 7% population increase during the more recent period. Higher post-2000 growth rates in Pacific, New Haven, Union and Sullivan are believed to have been significantly influenced by annexation activity. The recent addition of vehicle lanes along I-44 and particularly on Highway 100 to Washington will greatly facilitate access to the city. This, coupled with future annexation and other local initiatives, could result in an increase in the city's rate of growth over the next ten years.

2. Age Groups

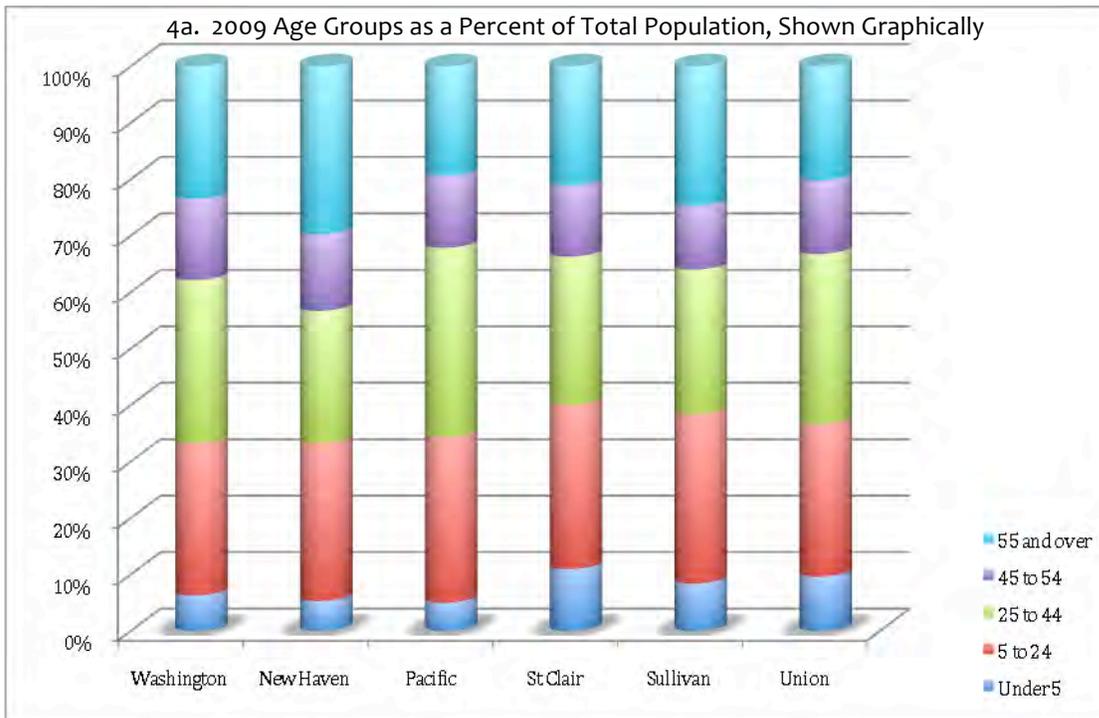
Broad age groupings for the six cities are shown graphically in Figure 4 below. The data incorporates more recent information from the American Community Survey.

Washington has the third-highest ratio of people in the “25 to 44” age group and the lowest proportion of residents in the 5-24 grouping. It ranks fourth in the proportion of people under 5 and first in the 45-54-age range, and it has the third-highest proportion of residents in the 55 and over grouping. The graphic at Figure 4a indicates that the 45-and-over groupings in New Haven are larger than in Washington. Similarly, the 25-44 range in Pacific is larger. The number of children under 5 is larger in Pacific.

4. 2009 Age Groups as a Percent of Total Population Among the Six Cities

City	Age Groups as a Percentage of Total Population				
	Under 5	5 to 24	25 to 44	45 to 54	55 and over
Washington	6.3	27.0	28.9	14.4	23.5
New Haven	5.3	28.0	23.4	13.6	29.7
Pacific	5.0	29.4	33.6	12.8	19.4
St. Clair	11.0	29.2	26.3	12.6	21.2
Sullivan	8.4	30.0	25.6	11.3	24.7
Union	9.6	27.0	30.1	13.0	20.2

Source: U.S. Census ACS, 2009



3. Household Income

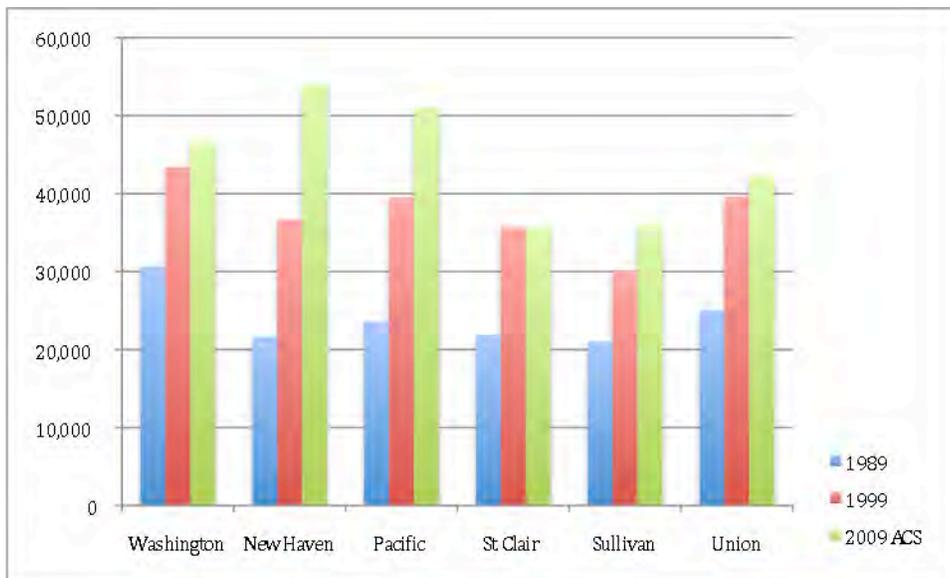
In Washington, median household income continued to rise between 1989 and 2009. (See Figures 5 and 6 on the following page.) Income in New Haven and Pacific grew dramatically between 1999 and 2009. Although Washington no longer leads its neighbors in this benchmark, median household income here is nevertheless third highest of all of the comparison cities. Although it is a given that individuals will consider walking and bicycling for economic reasons, it is believed that people in moderate and upper income categories will also consider such modes for other purposes including recreation and fitness, if certain environmental and physical conditions are present, and this will be further examined in a later section of the report.

5. Median Household Income in the Six Cities - 1989 - 2009

City	1989	1999	2009
Washington	\$30,650	\$43,417	\$46,665
New Haven	\$21,622	\$36,681	\$53,819
Pacific	\$23,606	\$39,554	\$51,004
St. Clair	\$21,853	\$35,716	\$35,683
Sullivan	\$21,019	\$30,046	\$35,995
Union	\$25,033	\$39,596	\$42,392

Source: U.S. Census and ACS

6. Change in Median Income Shown Graphically



4. Educational Attainment

Washington continues to have a larger percentage of residents with baccalaureate and graduate degrees than any of its neighboring cities as shown in Figures 7 and 8. This may be at least partially due to the relatively high number of larger firms based in Washington who may have higher education requirements for their employees. It could also be that this represents a cohort of older, retired individuals.

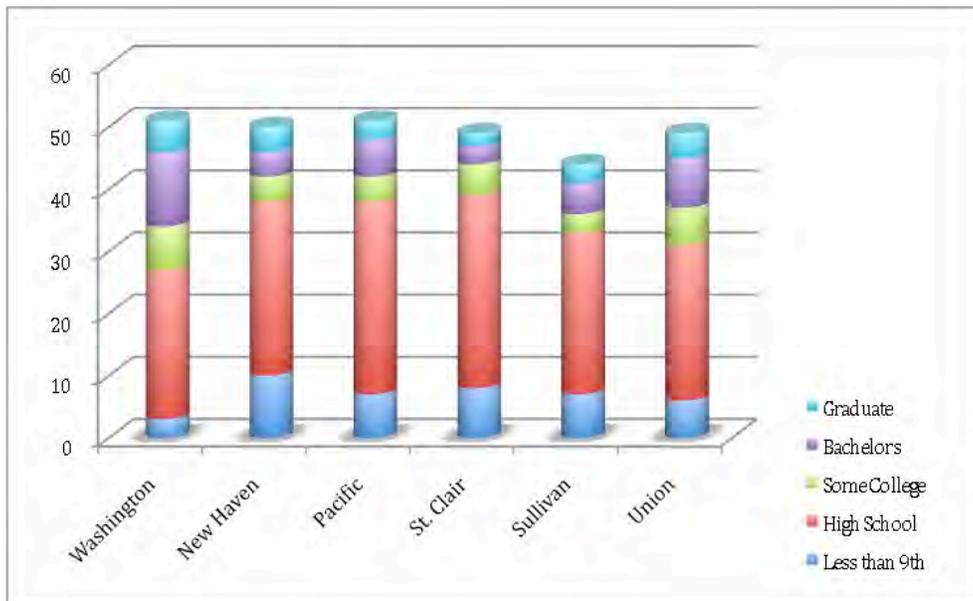
Regardless of where these graduates are in the city's age and employment demographics, they are nevertheless significant for the present study. This is because data from other cities has shown that people with higher levels of educational attainment tend to be more interested in bicycling as a mode of transportation to work and/or as form of recreation and fitness. Thus there is a likelihood that a system of bikeways and pedestrian facilities would be in relatively strong demand in Washington.

7. Educational Attainment in 2009 as a Percent of Total Population in the Six Cities

(U.S. Census American Community Survey, 2009)

City	Less than 9 th Grade	High School	Some College	Bachelor Degree	Graduate Degree
Washington	3	24	7	12	5
New Haven	10	28	4	4	4
Pacific	7	31	4	6	3
St. Clair	8	31	5	3	2
Sullivan	7	26	3	5	3
Union	6	25	6	8	4

8. Educational Attainment in 2009, Graphically Shown



5. Journey to Work

The number of people that use a bicycle for their journey to work in the United States has been steadily increasing, especially as new bikeable/walkable routes are established. The 2009 data on journey to work for the six compared cities is shown in Figure 9.

The City of Washington had 5,886 people who drove alone to work and 674 who were in a carpool. The carpooling figure represents 10 percent of all commutes to work. The percent of carpools in compared cities ranged from 2 percent to 22 percent. Public transit as a commuting mode was non-existent in all of the cities, as was the bicycle mode. There were 142 people in Washington who walked to work.

9. Journey to Work – Year 2009

City	Drove Alone	Car Pooled	Public Trans	Motor-cycle	Bicycle	Walked	Worked at home - Other	Total
Washington	5,886	674	0	16	0	142	208	6,926
New Haven	775	178	0	0	0	47	26	1,026
Pacific	2,624	480	0	0	0	40	63	3,207
St. Clair	1,417	334	0	0	0	44	57	1,852
Sullivan	2,190	667	0	0	0	89	85	3,031
Union	3,475	691	0	0	0	83	162	4,411

Source: U.S. Census, American Community Survey, 2009

The 2009 data on travel time to work provides some insight into the potential for bicycles to be used as a commute to work mode. (Refer to Figure 10 below.)

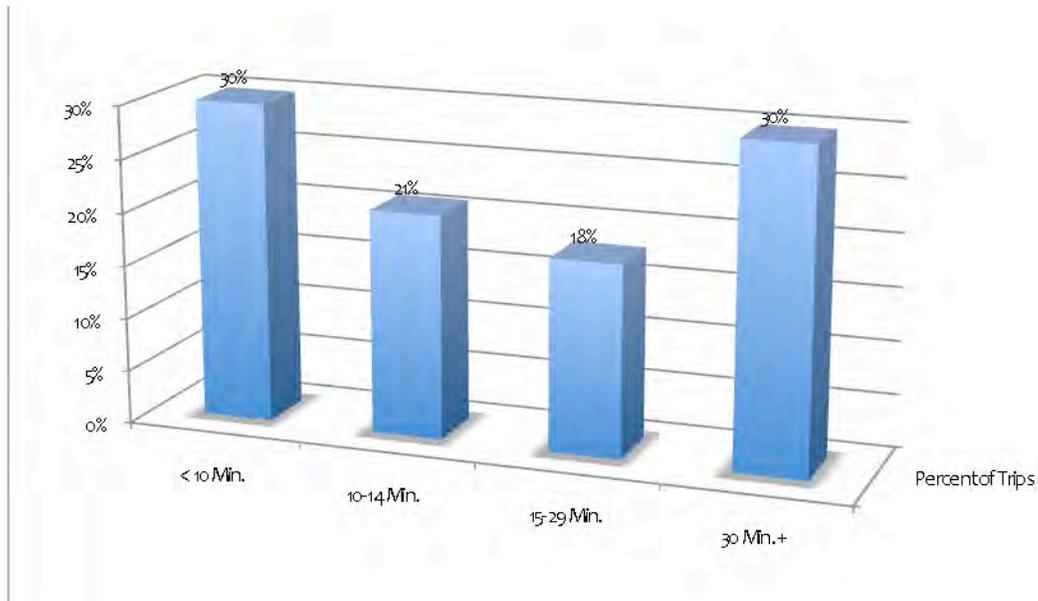
Commuters travelling less than 10 minutes to work - 2,022 individuals in Washington - worked within or close to the City, and it can be assumed that a portion of this cohort would consider biking at least as an occasional means of commuting to work with adequate infrastructure and encouragement. Similarly, some of the 1,443 Washingtonians driving 10-14 minutes to work would also consider the bicycle as an alternative commuting mode. And some of Washington’s commuters who have a 15-29 minute travel time to work would even consider a 20 to 34 minute drive to work potentially bikeable. In Washington, there were 1,239 such commuters representing another cohort from which there could be interest in commutes by bicycle.

10. Year 2009 Travel Time to Work in the Six Cities – Number of Trips

Less than 10 minutes	2,022	335	556	356	1,010	951
10 to 14 minutes	1,443	51	383	147	419	415
15 to 29 minutes	1,239	267	1,094	550	538	1,104
30 minutes or more	2,035	347	1,111	742	988	1,813
Total	6,739	1,000	3,144	1,795	2,955	4,283

City	Washington	New Haven	Pacific	St. Clair	Sullivan	Union
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11. 2009 Travel Time to Work in Washington – by Percent of Trips



B. Existing Physical Features and Land Uses

This section provides a review of physical features and land uses in Washington and its immediate surroundings. Included are land uses that either are currently in existence or are in the planning and development stage. (Also refer to the attached map of the city – Illustration 12.) In this section, potential concepts relating to the use of physical features and land uses in an integrated bicycle-pedestrian transportation system are initially discussed. They will be further explored in the plan chapter.

1. Streets, Roads and Highways

The city and surrounding area are well served with an efficient system of highways, arterials, collectors and residential streets maintained by the City of Washington, the Franklin County Highway Department, and the Missouri Department of Transportation (MoDOT). This section provides an analysis of major roads. Additional analysis will be conducted in Chapter II during the planning phase of work.

The principal roads directly serving the city are State Highways 47 and 100. Highway 100 travels through the east-west and Highway 47 north-south. Interstate 44 provides access to the city by way of Highway 100. Recently, MoDOT completed a major reconstruction of Highway 100 from Interstate 44 to Highway 47, which included roadway expansion from two to four lanes. In 2012, MoDOT plans to extend these improvements between Highway 47 and High Street.

Other principal routes in the surrounding area include Highways 50 and 185. An aging bridge carries Highway 47 across the Missouri River in downtown Washington. It will eventually be replaced by MoDOT although the project has not yet been scheduled. (See Figures 13 and 14 on the following page.)



13. Principal Highways-Roads serving Washington.
(<http://missouri.2havefun.com/maps/franklincounty.html>)



14. The Highway 47 bridge at Washington will eventually be replaced with a new structure. Inclusion of bike lanes along with shoulder improvements to Highway 47 north of the city are critical needs in terms of connecting the city to the heavily used Katy Trail. Image source: <http://washmo.com/news/16-around-washington-mo/273-highway-47-missouri-river-bridge-repairs-underway>

Many of Washington’s residential streets are presently adequate as conveyances for bicyclists with a wide range of abilities due to their lower traffic levels and to relatively low truck and bus traffic. In the older part of the city this is facilitated with good grid system. However, in newer subdivisions cul-de-sacs prevent or hinder efficient use of bicycles as a longer distance transportation option. In other communities where pathways exist to interconnect cul-de-sacs, bicycle and pedestrian activity is higher and movement is more efficient. Aside from the barriers formed by cul-de-sacs, the only other significant deficiency on these streets is the lack of a signed routing system that would be useful in directing cyclists to desired commercial, retail, and institutional destinations.¹

Because arterial and collector roads carry higher levels of traffic including trucks and buses, they may only be viewed as adequate by a narrower range of cyclists - generally more experienced commuting and fitness riders who are comfortable sharing streets with busier

¹ The central portion of the city does have a nine-mile long core bicycle route connecting to the Rotary Riverfront Trail, which is described in Section C 2.

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traffic. These roads, especially during higher traffic periods, are not considered to be bicycle-friendly by a broader grouping of cyclists who are recreational riders, who may ride less frequently, and who may not feel as comfortable on roads with higher traffic counts (Refer to Figure 14a below.) Nevertheless, these roads are presently used by some cyclists, and they are useful for practical transportation purposes. For these reasons, they will be more closely examined in the plan chapter for potential improvements so that they may more adequately accommodate cyclists.

14a. Traffic County Map

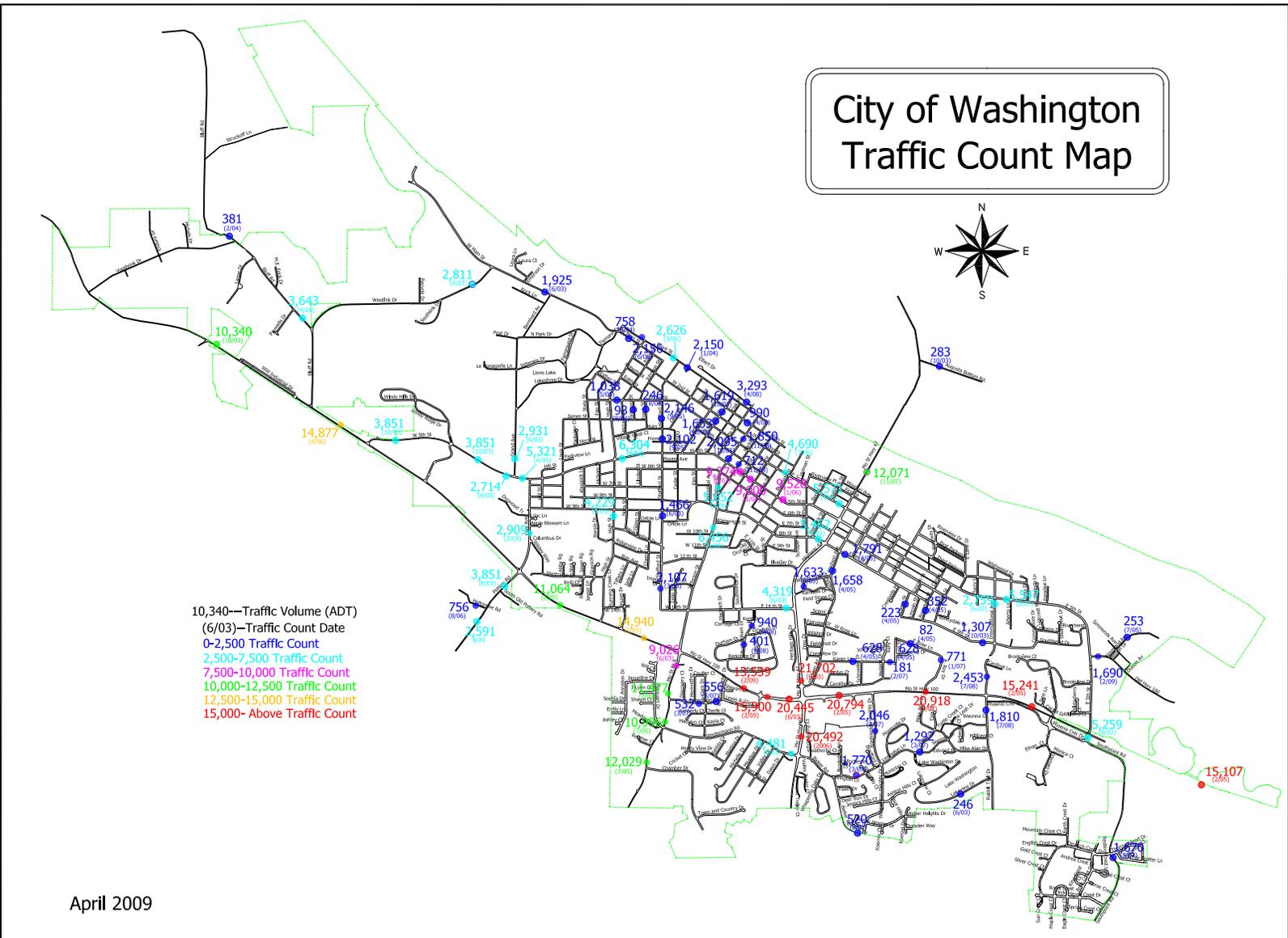
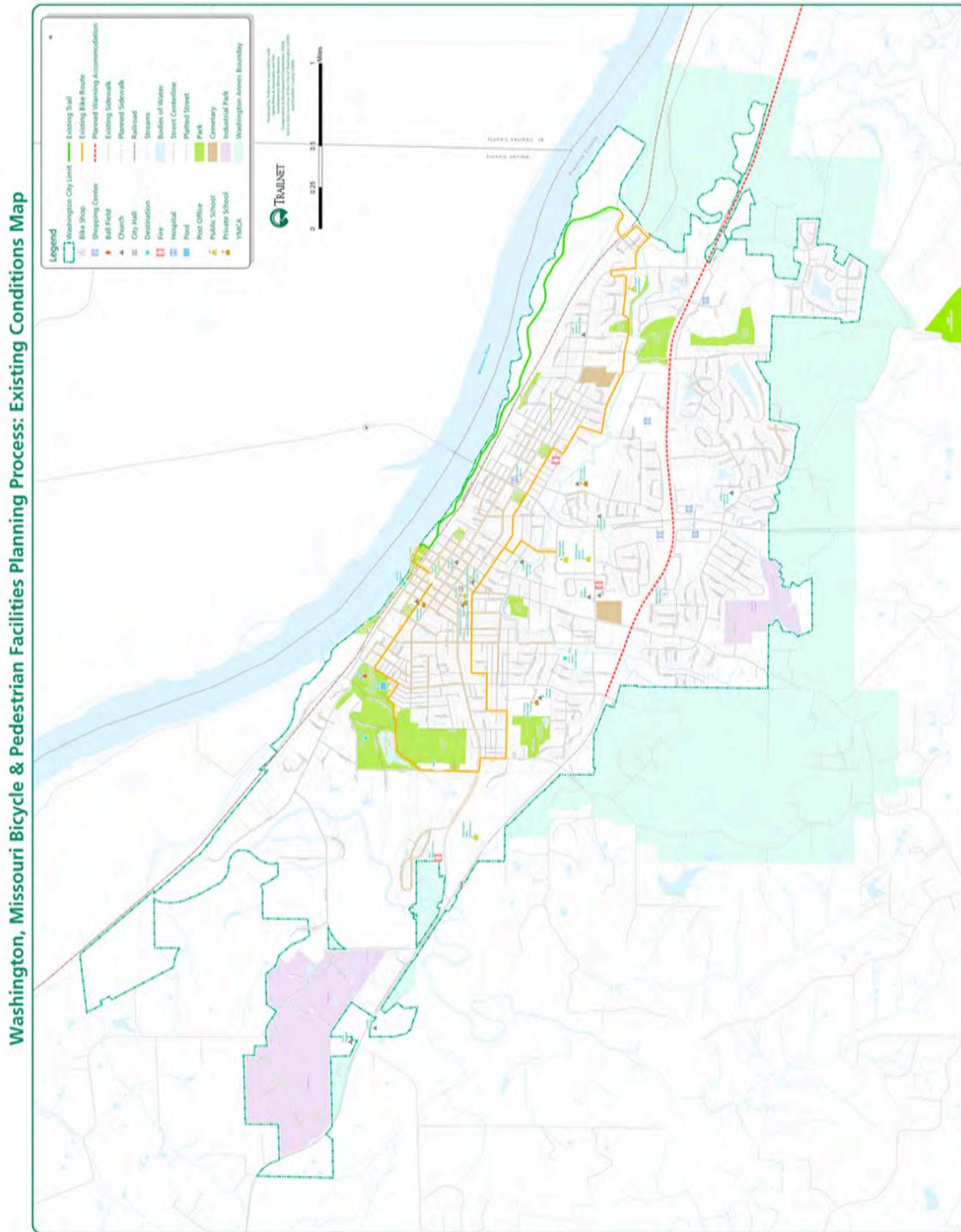


Illustration 15 provides a nominal assessment of current traffic conditions on selected arterials and collectors of Washington. In this planning study, nominal Levels of Service (LOS) were assessed based on visual observation rather than on traffic engineering parameters. (Engineering-based LOS analyses are more appropriately conducted as part of an official traffic engineering study or as a prelude to the design/engineering of specific roadway improvements.) The present study is intended to form a preliminary baseline in order to make subsequent recommendations in Chapter 2 regarding the street components of a bikeway system for the city.

A LOS in the A-B range is characterized by free flowing vehicular traffic that varies from no restrictions, to stable flows with the beginning of some restrictions, though negligible. LOS levels of C-D represent a range of traffic volumes and densities that restrict drivers in their speed and maneuvering options – to unstable flow with sudden speed variations. LOS levels in the range of E-F signify less stable flows and more frequent/intensive speed variations – to complete stops of traffic at times. It should be reemphasized that the assessment provided in Illustration 15 provides a general level of analysis considered to be appropriate for a planning study.

12. The City of Washington



The Washington, Missouri, Bikeable-Walkable Community Planning Process -
 I. Existing Conditions and Analysis (Final Draft, July 21, 2011)

15. Nominal Assessment Of Traffic Conditions On Selected Streets (Revised 4/19/11)

(Note: This assessment reflects a general level of service methodology that evaluates traffic levels only. Other factors related to the evaluation of roads for bicycle suitability are examined elsewhere in the study.)

Street Name	Length (mi)	Limit To	Limit From	Class	LOS
12th	0.09	Stafford	Busch Creek Trail		A-B
14th	0.71	Stafford	Hwy 47/Franklin		A-B
2nd	0.06	Lafayette	Jefferson		A-B
3rd	1.54	Jefferson	International		A-B
5th/Southpoint	0.84	Hwy 100	Grand		A-B
5th	3.22	Clay	Southbend		A-B
5th	0.41	Old Hwy 100	Hwy 100		A-B
8th	1.24	Henry	Stafford		A-B
9th	0.41	Stafford	Klingsick		A-B
Bernard	0.27	Park	Main		A-B
Bieker	0.22	Hwy 47/Franklin	Lexington		A-B
Bieker	0.37	Washington Heights	Lexington		A-B
Bluff (serves Ind'l. Pk.)	1.04	Vossbrink	Hwy 100		C-D
Camp	0.13	Karen	Camp Connector/Rose		A-B
Chamber (serves Ind'l. Pk.)	0.55	Hwy A	terminus		C-D
Clay	0.35	Hwy 100	9th		A-B
Duncan	0.11	Hwy 47/Franklin	Duncan Heights		A-B
Front	0.81	Tiemann	Lafayette		A-B
Grand	0.38	Lakeshore	Park		A-B
High	0.11	Front	2nd		A-B
High	1.27	Hwy 100	Esther		A-B
Hwy 100	14.86	Judy	High		A-B
Hwy 47/Franklin	2.27	Riverfront Tail	White Oak		C-D
Hwy A	0.41	Steutermann	Hwy 100		A-B
Hwy A	0.63	Logan	Steutermann		A-B
International	0.63	3rd	Hwy 100		A-B
Jefferson	1.22	Hwy 100	2nd		A-B
Karen	0.40	Madison	Camp		A-B
Lakeshore	0.12	Veterans	Tiemann		A-B
Lexington	0.48	Bieker	Lake Washington		A-B
Madison	0.93	Hwy 47/Franklin	5th		A-B
Main	0.76	Westlink	Tiemann		A-B
Old Hwy 100	0.54	Highway	Busch Creek Trail		A-B
Park	0.49	Tiemann	Grand		A-B
Point (Southpoint)	1.22	Goodes Mill	Hwy 100		A-B
Pottery	0.26	Holtgrewe	Hwy 100		A-B
Rabbit Trail	0.36	Hwy 100	Wenona		A-B
Rainbow	0.18	Madison	Duncan Heights		A-B
Stafford	1.34	Front	14th		A-B
Steutermann	0.76	Hwy A	Hwy 47/Franklin		A-B
Tiemann	0.26	Front	Veterans		A-B
Vossbrink	0.82	Bluff	Hwy 100		C-D
Washington Heights	0.81	Hwy 100	Bieker		A-B
Wenona	0.44	Lake Washington	Rabbit Trail		A-B
Westlink	1.07	Main	Bluff		C-D
Westridge	0.33	Wildey	High		A-B
Wildey	0.20	Clay	Westridge		A-B

The road system should be viewed from a multi-modal standpoint. Significant portions of the system could eventually and with incremental improvements accommodate more bicycle and pedestrian traffic. For the future, it will be appropriate to include improved bicycle- and pedestrian-friendly features into roadway design standards. If enacted prior to development and the corresponding acquisition of right-of-way for roads, such standards could more easily be incorporated into the transportation system when it is ultimately built. In addition, the costs for these improvements could be financed through available external funding sources.

For a bicycle and pedestrian system to be effective, it should be transportation oriented: It should facilitate movement between trip origins and destinations. But such a system would also provide significant recreational opportunities, and because of this dual benefit it becomes possible to amortize the cost of such improvements across a wider user base and a broader funding spectrum.

In general, the following concepts should be considered when planning and developing new roads in the transportation system:

- Wider rights-of-way along roads classified as arterials and collectors to enable the provision of at least some level of bicycle accommodation
- Where wider collectors and arterials are not possible, consider multipurpose paths designed to bike path standards, within wider road right-of-way or on separate right-of-way such as inactive rail corridors and utility easements.

These concepts will be further explored in the Plan chapter.

Targeting Bicycle and Pedestrian Friendly Improvements. Local decision makers and regional planners continue to believe that the I-44 corridor is the next logical location for industrial, retail and residential development.² It is probable that such development will occur when the current recession ends. Similar growth can also be expected in Washington not only within existing industrial parks but also along major roads such as Highways 47 and 100.

² "Hillhouse: Interstate 44 Is Next Regional Growth Area." The Missourian, 12/26/08.

Some improvements to accommodate/facilitate bicycle and pedestrian movement have already been undertaken along Highways 47 and 100. Recently, the city also received approval for additional enhancements along Highway 100 from Southpoint to Highway 47, which include additional signage and striping for added improvements to bicycle mobility. Additional improvements along these corridors would further help to provide attractive conditions for short-distance bicycle trips, particularly where there are mixed-use developments that cater to newer, community-oriented lifestyles.

Strong growth is probable beyond the I-44 corridor as well, particularly in the eastern half of Franklin County and including the City of Washington. Although the present population density in the eastern portion of Franklin County is far from that of St. Charles County where explosive growth is now in its third decade, it is clear that recent historical growth in the eastern portion of the county may be taking it in this direction. Moreover, this growth may be more dispersed than it was in St. Charles County because of fewer topographical constraints, and could more quickly radiate from the Wildwood – Gray Summit area of St. Louis County toward Washington.

Regardless of when the next wave of growth will occur, it seems assured and in all likelihood will have a positive impact on Washington. The demographic composition of its citizens-to-be will in all probability include upwardly-mobile young professionals and retired individuals who will desire amenities including more trails, bikeable-walkable streets, and systems combining both to provide connections between residential areas and commercial-institutional destinations. (Figure 16.)



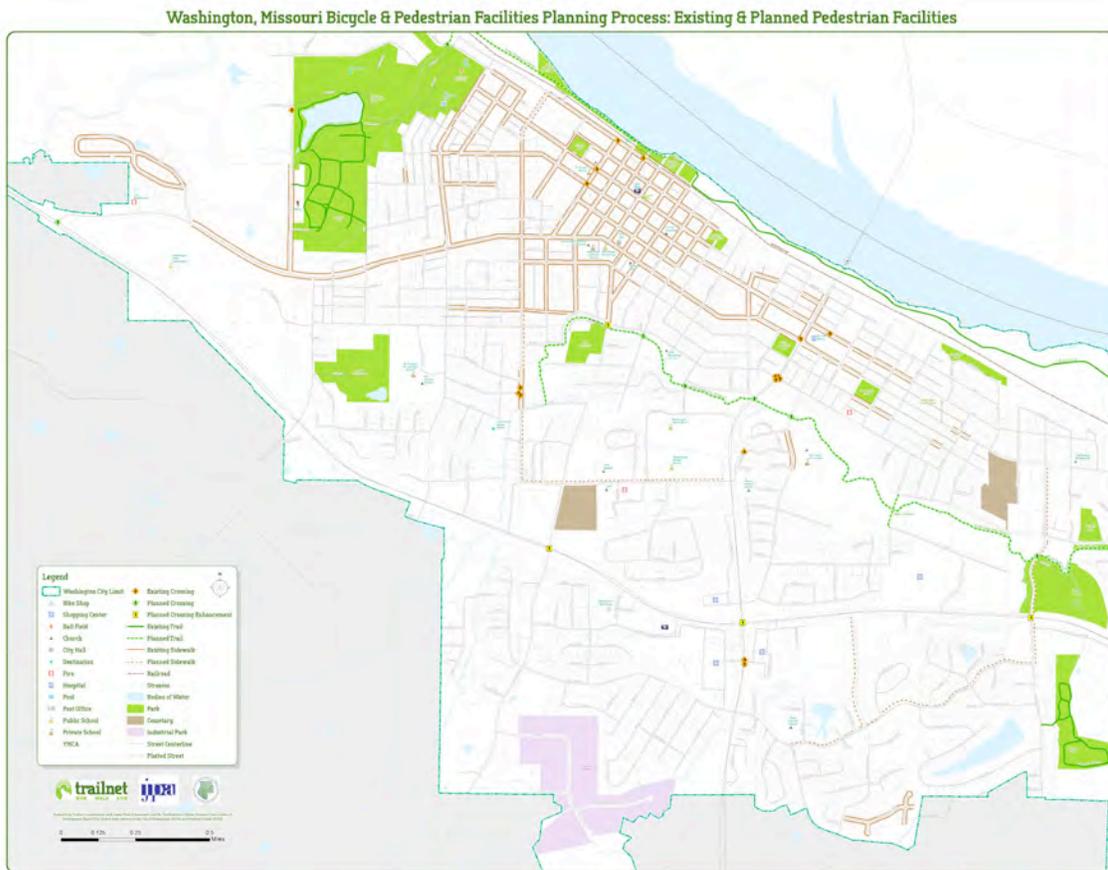
16. On-street bikeways can be part of a comprehensive system that serves both transportation and recreational interests, and which connects to area trails. (Image source: PBIC.)

2. Sidewalks

Washington has a fairly complete existing sidewalk system within the older portion of the community. The grid nature of the streets on which the sidewalk system is developed

.....
generally lends itself well to pedestrian movement. However, the system is aging. The City initiated a sidewalk maintenance and improvement program about fifteen years ago. It reviews and identifies hazardous sidewalks on an annual basis, and programs repairs accordingly. It is also extending the sidewalk network along major and collector streets. (Refer to Figure 16a.)

16a. Existing and Planned Pedestrian Facilities



In other urbanizing jurisdictions, goal-oriented approaches to pedestrian movement are sometimes added as a complement to basic regulations. For example, where there is mixed-use development or where there are transects between key residential and commercial/industrial areas, some cities have developed policies to help establish an infrastructure of pedestrian and related facilities to encourage healthful, cost-efficient, and environmentally-friendly transportation options.

Pedestrian facilities can consist either of traditional concrete sidewalks of a specified width, or 'pedestrian pathways' constructed of asphalt. Pathways are often wider and have several advantages: They can more easily accommodate a variety of walking behaviors including people walking two-abreast, parents pushing strollers, pets on leashes, and other activities. Jurisdictions also sometimes facilitate the development of non-motorized passages between cul-de-sacs to connect to adjacent neighborhoods and, ultimately, to shopping centers, employment centers, institutions and other destinations.



Striped or color-enhanced crossings with ADA-accessible ramps provide traffic-calming benefits and greatly facilitate pedestrian crossings at busier locations. (Figure 17.)

17. Striped crossings provide traffic calming benefits in addition to their primary function of pedestrian safety. Image source: Kay Fitzpatrick, [Improving Pedestrian Safety at Unsignalized Crossings.](#)"



18. Amtrak's Ann Rutledge in Washington. Image source: <http://www.railroadforums.com/photos/showphoto.php?photo=22743&cat=500&page=1>

3. Rail Lines

Washington is served by a heavily used high-speed rail line, the Union Pacific, on which roughly 30-40 trains run daily through the city's riverfront. The line is also shared by Amtrak which provides two daily stops in the city, and which allows bicycles on board. It is both a tourism asset and an important source of local pride. (Figure 18.)

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Many railroad corridors are utilized as recreational trails either through reclamation following de-activation (“rail-banking”), or where an active corridor has sufficient width to safely allow for a joint rail-with-trail operation. The State of Missouri is one of only a few state-level jurisdictions in the country to have acquired and developed a long-distance rail corridor (the Katy Trail immediately across the river) through rail-banking. This process enables de-activated rail corridors to be converted to recreational trail use. In Washington, it is highly unlikely that the heavily-used Union Pacific line would be de-activated at any time within the foreseeable future. However, it is not inconceivable that a joint rail-with-trail could be feasible along wider portions of the railroad corridor.

4. Principal Public Facilities and Institutions

Washington has a full complement of public facilities and institutions to support citizens and visitors. Among these assets are a charming older downtown area containing a variety of public and quasi public buildings including City Hall; the Franklin County Court House and Annex; the public library; the previously-discussed riverfront retail area; museums; and emergency services including police and fire stations and St. John’s



19. The Lake at Bernie E., Hillermann Park.
Source: City web site.

Mercy Hospital. This public facilities infrastructure is complemented by an extensive system of parks, trails, playing fields, swimming pools and lakes (Figure 19).

Education facilities include eight public elementary schools, one middle school, and a high school serving approximately 4,000 students in total. There are also three private elementary schools and a major regional parochial high school with a total enrollment of approximately 1,200 students. In total, more than 5,000 students attend classes in Washington.

Washington also has numerous churches serving a diverse population.

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The number and concentration of these facilities and institutions is significant because it defines an area of higher population density and destinations where the prospects to encourage higher levels of bicycling and walking activity will be strong.

5. Natural Features



20. The city has numerous attractive natural land features that lend themselves well to the development of an interconnected bicycle and pedestrian system. Photo: S. Sleet.

Washington is located in a scenic setting with a variety of strong natural features including rolling to hilly terrain, bluff topography, and dramatic views of the Missouri River. The city and its surroundings are also heavily vegetated and drained by several stream channels. Collectively, these natural features provide attractive raw material from which an interconnected bicycle and pedestrian system could readily be developed. (Figure 20.)

6. Existing Land Use

The City of Washington is located on the south side of the Missouri River in Franklin County. The older residential areas are located north of Highway 100, with the Central Business District situated on the river. Newer residential areas are generally south of Highway 100, with rural homes spreading out along Pottery Road, Highway A and South Point road. Newer shopping areas are located along Highway 100.

The city benefits from an unusually large concentration of industrial development on the west side in several large industrial parks. These industries, primarily established in the past

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thirty years, are a major source of employment for residents of Washington and surrounding areas.

A considerable amount of land in Washington is preserved as open space, including an existing riverfront park and a trail that frame the Missouri Riverfront. The riverfront provides the setting for a vibrant tourist-oriented commercial district that includes restaurants, shops and museums, with considerable additional commercial and retail development along Main and Second Streets.

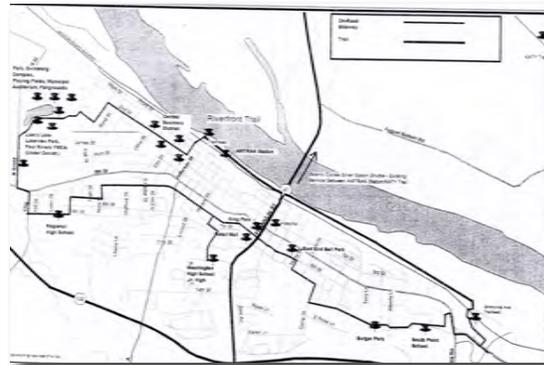
Planning a bikeable-walkable system for Washington should take into consideration the relationship between the places where people live and their daytime destinations - commercial areas, industrial areas, institutions and public facilities. Washington is unusual in that almost all of its industrial uses are located in the industrial park on the west edge of the city. Thus non-motorized connectivity should incorporate this area, which is broadly defined by the Missouri River and Fifth Street and between Fifth Street and Highway 100 and south of Highway 100 through the newer residential area. Logically north – south cross connectors should utilize intersections controlled with signage or electric signals.

Another unique aspect in planning a trail system for Washington is the considerable amount of publicly owned open space along the Missouri River – a feature few cities possess. This corridor extends almost uninterrupted for approximately three miles to the northwest edge of the aforementioned industrial area. These and related opportunities will be further examined in the plan chapter.

7. Previous or Pending Plans

An important element in the planning process to establish new bicycle and pedestrian facilities is the identification of older plans related to this subject that may already be in some form of implementation.

Washington in fact has entered its second generation of bicycle facility planning with the present effort. In 1999 the city completed its first Bicycle Facilities Plan and immediately began to implement it. The existing Rotary Riverfront Trail and a nine-mile long bicycle route through the city's historic core area resulted from this effort. This core system should be the beginning point for an expanded system serving the entire city. (Figure 21.)



21. Washington's first bicycle facilities plan, completed in 1999, set the stage for successful development of the Rotary Riverfront Trail and a nine-mile on-street bike route in the city's core area. This early effort can be the starting point for an expanded city-wide system.

The Envision Washington Comprehensive Plan, completed in 2003 and currently in effect, contains several provisions directly or indirectly supportive of new bicycle and pedestrian facilities, including those listed below.

- Add sidewalks to collector and arterial roadway system and encourage sidewalks in new residential development (p. 54)
- Recommendation to revise zoning and subdivision regulations to provide additional green space in conjunction with new development (p.55)
- Expand existing Rotary Riverfront Trail to the west to tie into the park system (p. 56)
- Open space (p. 58)
- Add provisions to maximize green space as well as permeable surfaces (p. 61)
- Develop provisions to maximize green space/passive park space, as well as permeable surface in subdivisions regulations (p. 62)

- o Ensure that subdivision streets are designed for multi-modal purposes, permitting not only motor vehicles and emergency vehicles but safe use by pedestrians and bicyclists as well (p. 62)
- o Require the interconnection of cul-de-sacs with bicycle and pedestrian ways (p. 62)
- o Encourage the development of grid-type street system (p. 62)

Significantly, the absence of adequate bicycle and pedestrian facilities at the Lafayette Street rail crossing was also noted in the plan. In addition, the lack of connectivity between the city's expanding bikeway system and the Katy Trail in Warren County was identified as a pressing need. Indeed, this issue has had a long history in the city, having been noted by community leaders and citizens well before the last plan was initiated. The key issue here is the existing Highway 47 Bridge, which, with its narrow and obsolete two-lane configuration, presents a substantial impediment to connectivity between the city and the Katy Trail. A short segment of the highway in Warren County between the bridge and the city's airport represents the final impediment to connectivity.

The need for connectivity between the city and the Katy trail is not only driven by a desire for additional trail amenities for the city's growing population. With annual Katy Trail visitation in the vicinity of 300,000 people and because Washington is the largest Katy Trail city between St. Charles and Jefferson City, the absence of safe bicycle connectivity between the two constitutes a significant impediment to commerce for both trail users and the city alike.

C. Existing Bicycle Facilities in the Area and Elsewhere

1. Bicycle Facility Types

A variety of bicycle facility terms are used by the American Association of State Highway and Transportation Officials (AASHTO), the national group that disseminates guidelines for these facilities, and by other authorities as identified below. These these terms are presented here as an introduction to the review of existing bicycle facilities in Washington.

Warning Accomodation. A minimal treatment consisting only of “Share the Road with Bicycles” signage – a warning sign used in the Manual on Uniform Traffic Control Devices (MUTCD). This treatment may be appropriate for higher traffic situations including arterials and some highways where there is either already – or likely to be – some bicycle traffic and where there are limitations that do not allow for widening in conformance with an official bicycle facility such as a bike lane. This treatment uses the approach of warning both motorists and cyclists of a shared road condition on a busy road. The Missouri Department of Transportation (MoDOT) uses it on some of its roads and will use it on the recently-proposed improvements to the Highway 100 corridor in Washington.



Image Source: MUTCD

Bicycle Facility. A generic term describing any marked or unmarked street route, bicycle lane or path.

Bikeway. Another generic term for any road or path which in some manner is specifically designed as being open to bicycle travel, regardless of whether the facility is designated for the exclusive use of bicycles or is to be shared with other transportation modes.

Key Bicycle Street. A shared roadway which, though not designated by directional and informational markers, striping, signing, or pavement markings for the preferential or exclusive use of bicycle transportation, is, or can still be, used by bicyclists.

Bicycle Route. A segment of a system of bikeways designated by the jurisdiction having authority, with appropriate directional and informational markers, but without striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. (*Class III bikeway.*)



Image Source: PBIC

Bicycle Lane. A portion of a roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. Usually couplets, each one in a different direction and adjacent to the outside through travel lane. (*Class II bikeway.*)

Bicycle Path. A path that is physically separated from motor vehicle traffic by open space or a barrier and either within the road right-of-way or within an independent right-of-way. (*Class I bikeway.*)



Image Source: JPA

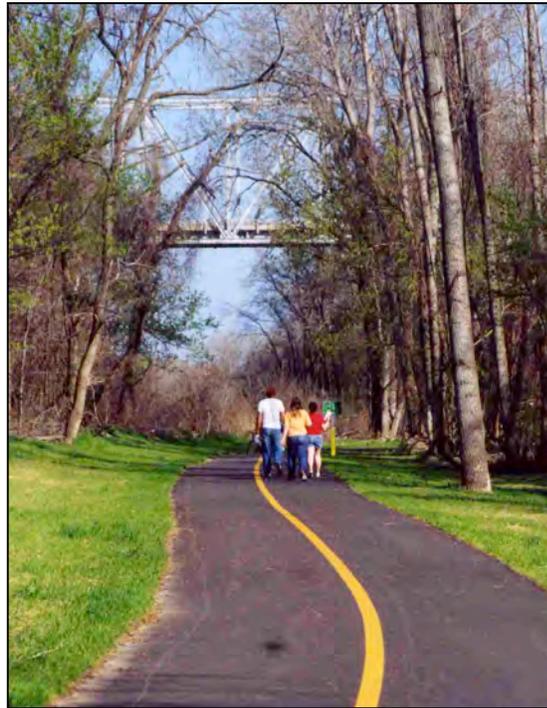
Shared Roadway. A street or highway without bikeway designations. Most bicycle travel now occurs on such roadways.

Shared Use Path. A bicycle path which, although designed primarily with the bicyclist's safety in mind, is likely to attract other users such as pedestrians, joggers, dog walkers, people pushing baby carriages, persons in wheelchairs, skate boarders, in-line skaters, and others. Most newer bike paths attract such users.

Signed Shared Roadway. Roadways designated by bike route signs, and which serve either to provide continuity to other bike facilities, or designate preferred routes through high-demand corridors.

2. Linear Bicycle Facilities in Washington

Only a few linear trails presently exist in Franklin County, with the most prominent example located here in Washington. The Rotary Riverfront Trail is a three-mile long facility that connects to a larger nine-mile on-street bike route that forms a core bicycle circulation system for the central portion of the city. It has been one of Washington's most heavily used park facilities since its development in the late 1990's. (Figure 22.) The present Bikeable-Walkable Community planning study is intended to lay groundwork for a citywide expansion of the core bikeway to facilitate non-motorized movement.



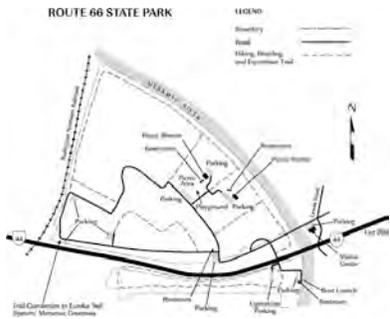
22. Washington's Rotary Riverfront Trail has become one of the city's most heavily used park facilities, and could become the centerpiece of a citywide non-motorized transportation system (JPA Photo).

3. Other Bicycle Facilities on the Missouri Side of the St. Louis Region



23. The Katy Trail has also become one of DNR's most heavily used parks.

Major bicycle facilities located immediately adjacent to or close to Washington include the Katy Trail, Route 66 State Park, and the Chesterfield-Monarch Levee Trail. The Katy Trail (pictured) extends through St. Charles and other counties primarily along the north bank of the Missouri River. This 230-mile long facility has become one of DNR's more heavily-used parks as well as a major tourism asset for the State of Missouri. (Figure 23.)



Route 66 State Park was developed on the site of the former city of Times Beach, a remediated Superfund site. This unusual facility has a bike path network consisting of a separate trail that is integrated with the city's old street system. There is also a connection to the City of Eureka south of I-44 by way of an underpass. (Figure 24.)

24. Route 66 State Park.

Other trails in adjoining and nearby Missouri counties include the Riverfront Trail (11 miles); the Old Chain of Rocks Bridge (1 mile); Grant's Trail (8 miles) and its soon-to-open extension to Kirkwood (2 miles); the Creve Coeur Lake Park Trail (3 miles); and the Page Connector bike facility (2 miles). Excluding portions of the Katy Trail which are not located in St. Charles County, the area's major existing bicycle facilities total approximately 55 miles. This system includes two important trail connections to an extensive additional trail system in Illinois.

Many Missouri and Illinois trails have been underwritten over the past fifteen years by the federal Transportation Efficiency Act for the 21st Century (TEA-21), and its predecessor program, The Intermodal Surface Transportation Efficiency Act (ISTEA). This program in all likelihood will be re-authorized.

The trail boom in the St. Louis Region is the result of a combination of factors in addition to the readily available funding. Among these factors is their strong and growing popularity with local residents and tourists alike. Because of this popularity, positive economic impacts have resulted. The Katy Trail itself (formerly called the Missouri River State Trail) is a case in point. The American Hiking Society reported the results of a study which found that, "After just one season, 61 businesses located along the (Trail) reported that (it) was having a positive effect on their businesses. Eleven of the businesses reported that the Trail had strongly influenced their decision to establish the business, and 17 (28%) had increased the size of their investment since the Trail had opened."¹

¹ "The Economic Benefits of Trails;" American Hiking Society.

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The Missouri Department of Natural Resources (MoDNR), which manages the trail, reported the following impacts in 2004²:

- o 300,000 annual users
- o 300 trail-oriented businesses
- o Visitation from 50 states and 20 foreign countries
- o The “typical” repeat visitor is in the mid-40’s with one or more college degrees and income of \$75,000 or greater
- o Average expenditures: \$230.16
- o Trail visitors also liked to visit nearby historic/interpretive sites, shopping destinations, wineries

4. Selected Facilities in Other Parts of the Country

In order to gain further insight into the scope and impact of trails on local communities, this section briefly examines selected bicycle facilities in other parts of the country, with a focus on longer facilities as well as on their economic impact.



25. Ohio's Buckeye Trail System logo.

The State of Ohio’s Buckeye Trail system is over 1,400 miles in length. It is actually a series of individual trails and bicycle route connectors throughout the state which are blanketed by the Buckeye Trail brand and marketed as a single trail asset by the state’s tourism office. One of the trail elements is the Loveland-to-Morrow segment of the Little

Miami Scenic Trail, which joins towns of the same name. Approximately 11 miles in length, this trail is heavily used by both residents and tourists, and is now an important regional and local economic asset. The facility – built on an old rail corridor - was developed with state resources and extensive support from both communities. A portion of Loveland’s old downtown commercial district is located on the trail, and contains a number of prospering businesses, including the ice cream shop that cater to trail users.

² Information generated in 2004 by Wallace Keck, reported by Brent Hugh, Missouri Bicycle Federation

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The Monon Trail in Indianapolis is one of many popular trails across the country. A study of this 10-mile long trail examined the “premium” that people are willing to pay for location along a greenway corridor. (Trails on separate rights of way are typically located within greenways.) All other factors being equal, it found that the typical house along a greenway sold for an average of \$3,731 more than its non-greenway counterpart.³

Considerable additional information exists on the positive economic benefits of trails, as briefly summarized below:⁴

- A 1992 study of the Oil Creek Bike Trail by Pennsylvania State University revealed that average visitor spending was \$25.85 per day.
- As of 1992, approximately 170,000 individuals visited the Tallahassee-St.Marks Trail in Florida every year, with daily expenditures averaging \$11.00.
- 135,000 people visit the Heritage Trail in Iowa, and spend an average of \$9.21
- “Nationally, trail-related expenditures range from less than \$1 per day to more than \$75 per day, depending on mileage covered. Generally, it's been found a [longer] trail can bring at least one million dollars annually to a community, depending on how well the town embraces the trail....”⁵

The relationship between trails, recreational tourism and economic development has been demonstrated in many examples. The data show that an adventure tourism-based “industry” is possible for communities that develop longer trail systems where there are also numerous attractions and a coordinated marketing strategy. The trails discussed above are strong examples of this trail-economics relationship. Given Washington’s existing riverfront tourist attractions along with the 3-mile Rotary Riverfront Trail, and with a new longer-distance bikeway system including potential connections to the Katy Trail to the north and New Haven

³ Public Choices and Property Values: Evidence from Greenways in Indianapolis: School of Public and Environmental Affairs, Indiana University. December 2003. Page 9.

⁴ Source material: NBPC Technical Brief: “The Economic and Social Benefits of Off-Road Bicycle and Pedestrian Facilities” September 1995.

⁵ Source: Economic Impacts of Trails. National Trails Training Partnership website.

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to the west, the city could directly and dramatically capitalize on the emerging eco-tourism industry

This section has shown that communities elsewhere benefitted substantially from longer trail facilities that connect to commercial-retail areas. A similar outcome is possible in Washington, given its existing tourist-oriented activity along the riverfront and proximity to the Katy Trail.

D. Existing Bicycle and Pedestrian Activity and Projected Facility Needs

1. An Estimate of Existing Bicycle and Pedestrian Activity

Historical statistical data on existing bicycle usage in Washington is unavailable, nor have surveys been undertaken to measure levels of existing usage. Nevertheless, experiences in Washington itself, the Katy Trail and elsewhere have shown that, when bicycle and pedestrian facilities are developed to connect residential areas with desirable destinations and activity generators, they are well used. Washington's own Missouri's Rotary Riverfront Trail, which connects to a nine-mile long on-street bikeway system, is heavily-used (pictured, Figure 26. Similarly, the Katy trail receives consistently heavy usage. A significant proportion of these trail users are bicyclists.



26. The Washington Parks Department has reported consistently heavy usage on the Rotary Riverfront Trail.

Notwithstanding this anecdotal information, an assessment of existing bicycle usage in the city is important to this study, and several methods exist for developing a reasonable estimate of bicycle activity in different categories of usage. This is examined below.

Participation in Activities Likely to be Undertaken on a Trail or Greenway. The Metro East Park and Recreation District (MEPRD) completed its Long Range Development Plan in 2003. Through a detailed and statistically valid survey, it measured *rates of regular participation by households* in St. Clair and Madison Counties in a wide range of activities. Included in this survey were activities that are very likely to be undertaken on a trail or a greenway. For example, the results indicated that 65% of the households walked or jogged

regularly; 47% regularly visited nature areas; 27% regularly engaged in bicycling and/or BMX activities; 20% hiked regularly; and 16% regularly ran.¹

From MEPRD’s multi-county household survey data and using the given percentages, estimates of probable regular participation by Washington households in activities likely to be undertaken on a trail/greenway can be made. These estimates are shown in the table below, using the city’s 2009 averaged population and household counts of 14,179 and 5,849 respectively, which results in an average household size of 2.42 individuals (Figure 27).

**27. Estimated Regular Participation by Washington Residents
 in Activities Likely to be Undertaken on a Trail or Greenway**

Leisure Activity	MEPRD’s Multi-County Percentage of Households who Regularly Participate	Probable Participation Events in Activities Compatible with Trail Facilities²
Walking/Jogging	65%	3,802
Visiting Nature Areas	47%	2,749
Bicycling/BMX	27%	1,579
Hiking	20%	1,170
Running	16%	936
Total Participation Events	n.a.	10,236

The MEPRD survey also measured the *leisure activities in which the respondent households participated most often*. Of the activities that are very likely to be undertaken on a trail or a greenway, respondents participated most often in the following (in descending order):

- Walking/jogging
- Bicycling/BMX
- Visiting nature areas.

¹ Long Range Development Plan, April 2003. Metro East Park & Recreation District (MEPRD). Page 50.

² Based on the city’s 2009 population of 14,179 and household size of 2.68 persons in 2000. Total participation exceeds the county population total because of participation by individuals in multiple activities.

If it were assumed that residents of Washington participated most often in the same activities and that a city resident would participate in such events about six times per year, then this means that 1,355 Washington residents regularly participate in events likely to be undertaken on a trail or greenway. (This value was obtained by summing the three trail-compatible participation events – 7,715 - and dividing by 6 frequencies to arrive at the estimate.) The estimate is believed to be conservative.

It is probable that many of these residents are undertaking trail-related leisure activities primarily on the Rotary Riverfront Trail or the Katy Trail. It is not unreasonable to assume that they represent a base “market” of trail users. This figure therefore represents a potential beginning point from which to define a user base for the trail portion of a bicycle-pedestrian system.

Elementary and Secondary School Children Likely to Use Bicycles on Streets and Sidewalks for Transportation and/or Recreational Activity. Based on field observations at area schools, there is presently some school-related bicycle usage. (Figure 28.) An estimate of this usage can be made based on the existing population of elementary and secondary school-age children in Washington and by making assumptions of how many children are likely to ride bicycles regularly, either to school or for other practical purposes.

Elementary and secondary school children between the ages of 10 and 14 are believed to be the group using bicycles most intensively. Children in this age grouping are most likely to consider the bicycle as a practical transportation option for trips to school or other local destinations. Children in this cohort are often considered by their parents to be old-enough to ride bicycles without supervision. The 10-14 grouping is readily measurable in the Year 2009 ACS data.



28. Washington Middle School. Based on field observations, there is presently some bicycling activity at area schools. Photo, S. Sleet.

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The ACS reported 1,032 children in the 10-14 year old age category who reside in Washington. For purposes of this study, it will be assumed that in 2009, 20% of the age cohorts – approximately 206 children – either occasionally rode bicycles to school or used them for other local transportation trips such as going to a friend’s house, shopping, or for other practical trips. This percentage is believed to be conservative.

Older children are also a part of the bicycling picture in Washington. However, while 15-17 year olds may ride bicycles, it is probable that their riding activity begins to wain as they approach the driving age. There were 558 15-17 year-olds residing in the city in 2000. Among this cohort and because the study team believes they ride bikes substantially less than their younger counterparts, it will be assumed that 10%, or about 56 individuals, occasionally ride bicycles either to school or for other practical transportation purposes.

Among young persons in the 18-21 age range, it will be assumed that only 5% do – or would - ride bicycles because of the reasons discussed above. There were 668 Washington residents in this age grouping in the 2000 U.S. Census. Therefore it is estimated that approximately 33 individuals bicycled to school or other practical destinations at least occasionally at that time.

Likely Adult Bicycle Usage on the Road System. There is no quantifiable local data on adult bicycle usage in the area. While there may be some overlap between the MEPRD data that estimates adults who presently ride bicycles on existing area trails as well as on city streets, it is believed that these are not widely overlapping groups. This is because observations show that many adults who ride bicycles on trails in the Metro East area or the wider St. Louis region are doing so as part of a recreational, social, or exercise experience. Similarly, it is observed that those who ride bikes on the street system tend to do so as individuals either for exercise, practical transportation purposes, environmental reasons, or combinations of these. (As more on-street bicycle facilities are developed and interconnected with trails and work destinations, the “typical” trail bicyclist may also include the commuter. But until such a system becomes a reality it is probable that the

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typical trail bicyclist will continue to be the individual who is there for a recreational,
social, or health-related purpose.)

As previously discussed in Section A, the 2009 ACS data reported no Washington residents riding a bicycle to work. This is somewhat surprising considering that Washington is a major job center. (142 individuals did report walking to work in that year.)

Commuting to work represents only a small portion of potential adult bicycle trips. As with the analysis of school-age children in the previous section, other kinds of practical adult trips must also be considered, such as to a local store, to a nearby institution such as a library or a public office, or to a park or other recreation facility. To gain a more comprehensive insight on the possible level of this type of usage on the road system of Washington, a brief review of national travel mode and trip purpose data is useful.

Transportation planners measure travel activity in terms of five transportation modes, in order of prominence: car, public transit, walking, bicycle, and 'other'. In 1997, the percentage of Americans who regularly rode a bicycle *as a travel mode* was 1%.³ (National average.) "Travel" refers to any trip purpose including shopping, errands, recreation, and getting to work.

A separate source of data on *commuting to work* is also available. The U.S. Census transportation to work data indicates that in 2001, .7% of the American work force regularly rode a bicycle or a motorcycle to work.⁴ In another study of eight cities known to have high bicycle usage rates (Chicago, Los Angeles, San Francisco, New York, Phoenix, Boston, Sacramento, & Seattle), from .3% to 1.4% of the population rode bicycles to work in the year



29. It is conservatively estimated that approximately .2% of Washington's population – about 29 individuals – presently rides bicycles on city streets. Photo: S. Sleet.

³ "Percent of Trips by Travel Mode, as of 1997 (all trip purposes)" Table by John Pucher, Transportation Quarterly, 98-1

⁴ "Table 1-35: Principal Means of Transportation to Work." U.S. Department of Housing and Urban Development, American Housing Survey: various years.

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2000. Although the data spans several years, they are still believed to be useful in gaining an insight into probable on-street bicycle activity in and near Washington.

Accordingly, and given the fact that Washington comprises a relatively small urbanized area compared to the cities above, the bicycle mode percentages reported above will be conservatively standardized to .2% in order to develop a baseline from which to measure the total adult on-street bicycle usage that may presently exist for any trip purpose. Using the city's estimated Year 2009 adult population of 14,179 persons, it is possible that about 28 adults are presently riding bikes on the city's road network.

Summary of Existing Usage. Current estimated existing bicycle usage, as well as other activities undertaken on trails and greenways and on streets within the county, is summarized in the table on the following page (Figure 30):

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**30. Summary of Estimated Existing Participation
 by Washington Residents in Activities Likely to be Undertaken
 on Trails, Greenways, and On-Street Bikeways**

Activity	Events *	Number of Persons
People Engaging in Activities Likely to be Undertaken on Area Trails and Greenways (Walking/jogging, visiting natural areas, bicycling/bmx activities)	7,715	1,355
Elementary/Secondary School Children (10-14) Regularly Riding Bicycles on Streets/Sidewalks	n.a.	206
Older School Children (15-17) regularly Riding Bicycles on City Streets/Sidewalks	n.a.	56
Older adolescents and young residents (18-21)	n.a.	33
Adults Regularly Riding Bicycles on City Streets/Sidewalks	n.a.	28
Total Estimated Existing Participation	n.a.	1,678

* Probable number of times that Washington residents engage in activities likely to be undertaken on trails and greenways, based on MEPRD's multi-county survey. (Refer to text for further information.)

** This estimate reflects the assumptions a) that Washington residents would engage in events likely to be undertaken on a trail/greenway at the same rate as the residents of MEPRD's service area; and b) that they would engage in such activities at least 6 times per year. (Refer to text for more information.)

In summary, these estimates were developed based on Washington's 2009 estimated population. While they may seem modest compared to the number of individuals who drive cars or use public transit, they nevertheless identify a probable base user group for a shared use trail system.

Special Bicycle Enthusiast Activities. Based on activity at Revolution Cycles bicycle shop and special events related to cycling, Washington not only has a healthy local cycling community but also draws from across the region and even the country as a destination for bicycling related tourism. The city's proximity to the internationally renowned Katy Trail, coupled with its own Rotary Riverfront Trail, numerous parks, existing bicycle-

friendly roads, and a host of more traditional tourist attractions such as restaurants, museums and shops, already result in an appealing destination and as a stop-over for cyclists participating in special events and activities.

One of the most prestigious professional bicycle races in the United States and highly ranked internationally, the Tour of Missouri (www.tourofmissouri.com) has passed through Washington in both 2007 and 2008 having an enormous impact in promoting cycling in the area, as well as in providing marketing exposure and local economic benefits to the city. (Figure 31.) The strong statewide spectator turnout over the past two years suggests that the state will continue sponsorship of the Tour in the future, creating new opportunities for Washington should it continue to be chosen as a host city.



31. The internationally ranked Tour of Missouri bicycle race passed through Washington both in 2007 and 2008. (Source: Tour of Missouri Website. Photo by John Pierce.)

The Race Across America (RAAM) is an extreme endurance event that has a strong national and international following. RAAM came through Washington this year drawing even more attention to the city and the region. (Figure 32.) On a pro and amateur level, the Washington Criterium and Washington Circuit bicycle races were also held in the last two years drawing hundreds of mostly mid-western racers to the challenging courses.



32. The RAAM, a well known extreme endurance bicycle racing event, was routed through Washington this year. (Photo of racer Pat Blair by John Pearce. The RAAM logo was obtained from the RAAM website.)

Locally, Revolution Cycles bicycle shop promotes cycling in the area through weekly Thursday night bike rides and many weekend rides during the cycling season and promotes these and other events on its website www.rev-cycles.com. They have also formed a Meetup.com cycling group to not only encourage riding but socializing as well. The shop experiences high call and rental volume throughout the cycling season that relates to the Katy Trail. The shop not only offers bicycle rentals but also bike trailers, car racks and a shuttle

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service from the city to the Katy Trail due to the non-bike accessible conditions on the old Missouri river bridge.

New web-based mapping technology allows the website MapMyRide.com to allow groups and individuals to post maps of cycling routes. The free and popular site lists twenty-three routes of different distances that start or pass through Washington. The link is at: <http://www.mapmyride.com/find-ride/united-states/mo/washington>.

There is a strong probability that new bikeway facilities will attract higher usage by a greater proportion of Washington’s existing population and by additional visitors who would be attracted to the city as a result of a larger bikeable infrastructure. Elsewhere, increased usage beyond original projections has been reported after trails have been developed. In one study conducted by the Humphrey Institute at the University of Minnesota, it was found that community bicycle usage increased when a practical bikeway transportation system was developed. (Source: “Transportation and Urban Trails.” American Trails.org.)

Pedestrian Activity On-Near the Public Right-of-Way. This section examines existing pedestrian activity along the public right-of-way.

Washington has a fairly well-developed sidewalk system in the older part of the city roughly bounded by Highway 47, Highway 100, High Street, and the riverfront. Beyond this area sidewalks are relatively rare. Surveys to identify and record actual pedestrian usage have not been undertaken. Such studies are relatively rare in the United States. However, an assessment of pedestrian activity can be taken through visual observation and by reviewing national studies on pedestrian travel.

In Washington, most of the pedestrian activity occurs on sidewalks or, where they are absent, on streets. The images here illustrate some of this activity. They highlight a central goal in transportation - to take the straightest and shortest possible route between a trip origin and its destination. (Figures 33, 34 and 35.)



33-35, from left: Pedestrian activity in Washington roughly equals the national average of 2.5%. An improved system comprised of sidewalks and trails interconnecting neighborhoods with industrial, commercial and retail areas would encourage still more activity, resulting in healthier residents, fewer vehicle miles travelled, cleaner air, and increased consumer activity. (Photos: S. Sleet.)

Nationally, the U.S. Census Bureau reports that 2.5% of Americans walk to work.

Washington's Year 2000 census data revealed that 162 residents walked to work – roughly 2.5% of the commuting population.

With improved pedestrian linkages between residential areas and nearby job centers, walking to work as a transportation mode could be further increased. In addition to the practical savings in reduced transportation costs, walkability provides significant health, social, environmental and economic gains, including the following⁵:

- Positive Correlation with body mass index and physical activity
- Opportunities for increased social interaction
- An increase in the average number of friends and associates where people live
- Reduced crime (with more people walking and watching over neighborhoods, open space and main streets)
- Increased sense of pride, and increased volunteerism.
- Decrease of the automobile footprint in the community. Carbon emissions can be reduced if more people choose to walk rather than drive.
- Economic benefits in terms of transportation cost savings – both to individuals

⁵ Frank, et al. "Many pathways from Land Use to Health," *JAPA*, Winter, 2006, p. 77; Frank, et al. "Linking objectively measured physical activity with objectively measured urban form: Findings from SMARTTRAQ," *American Journal of Preventive Medicine*, February 2005, pp. 117-25; Lopez, Russel P. and H. Patricia Hynes, "Obesity, physical activity, and the urban environment: public health research needs," *Environmental Health: A Global Access Science Source*, 2006; Todd Littman, "Economic Value of Walkability," *Transportation Research Board of the National Academies*, Vol. 1828, 2003

and to the public

- o Economic benefits from improved public health
- o Economic benefits in terms of supporting/facilitating retail development
- o The World Cancer Research Fund and American Institute for Cancer Research released a report that new developments should be designed to encourage walking, on the grounds that walking contributes to a reduction of cancer.

Studies have shown that pedestrian-friendly environments are more attractive to home buyers and therefore also attract more interest from developers and builders.

2. Projected Bicycle and Pedestrian Facilities Needs

Multipurpose Trail Needs. The National Recreation and Park Association (NRPA) publishes standards for a variety of open space-related facilities, including three types of trails: Walking/jogging trails, bicycle paths, and nature trails. Its benchmarks are .5 miles of each type of trail facility per 1000 population. (It does not have standards for a relatively new type of bicycle facility, the ATB/mountain bike trail.)

From a practical and cost-efficiency perspective, if bicycle paths are designed to national standards for such facilities (including wide asphalt or concrete surfaces with soft mulch or gravel shoulders, longer turn radii), then they would also be more than sufficient for the needs of walkers and joggers, persons with disabilities, roller-bladers, and for a variety of other non-bicycling trail activities as well. Moreover, there has been a major external funding source for the development of facilities designed to bicycle path standards, whereas grant opportunities for walking/jogging trails and for nature trails are somewhat limited. (Funding sources will be more closely examined in the plan chapter of this study.)

In terms of projected trail needs for Washington, two of the three NRPA facility categories should be combined and examined as one facility type: Multipurpose trails or paths that accommodate both bicycles, walking/jogging, and other related activities. According to

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the present NRPA standard of .5 miles of each type of multipurpose trail per 1000 population (1.0 miles total), and using the city's Year 2007 population estimate of 14,271, there was a need for just over 14 miles of multipurpose trails at that time. A projection of future need has been developed using the city's 2000-to-2007 estimated population growth rate of 7.7%. Based on this estimate, a 2000 – 2010 growth rate of 10% is projected. For the period 2010 to 2020, a growth rate of 13% will be projected. This scenario is based on the conservative assumption that at least of portion of the reduced growth rate that occurred between 2000 and 2007 was due to the economic recession and that there will be a moderate recovery over the next decade. This scenario results in a Year 2020 population projection of 16,461 for the city, and a total projected mulitpurpose trail need of 16.5 miles.

Presently, there are approximately three miles of mulitpurpose trails in Washington. Therefore, an additional 13.5 miles of multipurpose trails will be needed in order to serve the city's needs through the year 2020.

Specialized Nature Trails and Mountain Bike Trails. In terms of nature trails (the third type of trail defined in the NRPA standards), a trail of approximately one-mile presently exists in Washington. Nature trails are narrower paths paved with natural materials such as packed earth, wood chips, or soft gravel and sited in more rustic and environmentally sensitive areas where any activity other than walking would inflict environmental damage. Nature trails are intended primarily for walkers or hikers who desire a more natural experience, and are not suitable for any type of bicycle – road bike or MTB. Using the NRPA standard (.5 miles of nature trail per 1,000 population) and allowing for the existing mileage, therefore, results in a projected need for 7 miles of nature trails.

Mountain, or off-road, bicycling is another segment of the cycling market not addressed above. Mountain bikes (MTBs) are a significant component of the bicycle market. However, most of them are not substantially ridden on off-road trails. They tend to be ridden on conventional bicycle faciitiies and on streets. This probably relates to the fact that there is a general shortage of specially-designated trails for MTBs, and this deficiency

is reflected in Washington as well as the entire region. It is therefore probable that off-road riding would increase if more specialized facilities existed. For this study, .1 mile of MTB trail per 1000 population is assumed to be adequate. A total of 1.5 miles MTB trails in the city is therefore an appropriate goal.

On-Street (Shared Roadway) Bicycle Facility Needs. Per capita mileage benchmarks are not used by planners in the assessment of need for on-street bicycle facilities. The reason is that bicycles have been and are increasingly used as a form of transportation and they require access to typical destinations and therefore to all streets (except where presently prohibited such as on interstate highways).

Many lightly-travelled city streets are currently sufficient for bicycle usage. But in order to establish an interconnected and more functional on-street bikeway system with access to most/all destinations, some streets should receive specific bikeway treatments. This approach is not necessarily cost-prohibitive and will be addressed in the plan chapter.

An on-street bikeway system is intended to be used by a variety of residents including those who use bicycles for:

- Commuting to work
- Short-distance utilitarian trips (to the store, library, etc.)
- Recreation and/or fitness. (These riders often like the convenience of starting and ending a ride at their place of residence.)

Importantly, an improved on-street bikeway system will also help to make streets safer for school children who already use those streets and, it is believed, for additional children who would use them if they are improved.

Other significant reasons to consider the development of a comprehensive on-street bikeway system include:

- The strategic need for additional transportation options to help shift some trips away from automobile use

- An opportunity to create more livable – and marketable – communities to help attract younger residents who increasingly want access to close-to-home amenities
- A natural and healthful means of accessing trails without an intervening need for a motor vehicle

Improvements to establish an interconnected on-street bikeway system would require at least some level of treatment for a portion of the city’s existing streets. In many locations it could involve improvements as basic as the placement of warning signage. In other places it would require more intensive investment to establish bicycle



36. On-street bikeway improvements such as warning signage and other treatments would improve safety conditions for cyclists. (Image: Kevin Neill)

routes and perhaps bicycle lanes. At other locations cut-throughs at key cul-de-sacs might be useful in order to provide for route continuity or a significantly more direct route, and to help eliminate motor vehicle trips to local destinations.

Pedestrian Facility Needs. Because most trips begin and end with walking, pedestrian facility needs are best defined by the degree of completeness of a sidewalk system rather than by actually measuring local walking activity. The city presently does not require sidewalks in new subdivisions. A modification of zoning and subdivision regulations to require sidewalks in all new subdivisions – both residential and commercial – would greatly improve future conditions. For redevelopment or infill projects, the city should consider requiring compliance with the new sidewalk requirements rather than a “sunset” of the previous condition. These requirements will help to establish a new citywide sidewalk system that is consistent with the well-developed infrastructure that is presently in the core area city. The sidewalk system should also be directly connected to any multipurpose trails to be subsequently developed.

3. Conclusion

This study has analyzed existing conditions in the City of Washington as they relate to bicycling and walking. There are needs for more facilities to serve both pedestrian and

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bicycle modes. There is also a need for improved pedestrian crossings at high-traffic locations.

Additionally, the analysis highlights the need for a substantial and coordinated bikeway improvement program that builds on what Washington has already accomplished – to meet evolving and increasingly-sophisticated recreational and transportation needs. The study team believes that these needs will increase as it continues to grow. Given all of the factors described in the text, It is likely that residents will increasingly seek non-motorized transportation options for short-distance trips - a trend which is occurring elsewhere - in response to the volatility of fuel prices, the awareness of climate change, and increased interest in healthier lifestyles. The next chapter will present a specific bicycle and pedestrian facilities plan with implementation elements to address these needs.

II. Bikeable Walkable Community Plan

In this chapter, a plan is presented for the establishment of an improved system of bicycle and pedestrian facilities in Washington. The plan is based on the information and analysis conducted in the previous chapter. It reflects considerable comments and input received from citizens at several public forums. It also incorporates additional field reconnaissance over and above that which was undertaken during the existing conditions analysis to refine street segments in the plan.

The purpose of this plan is to enhance the transportation, recreation and fitness infrastructure in Washington. The plan includes goals and objectives, bicycle and pedestrian facility components, and a detailed implementation strategy.

A. Goals and Objectives

1. Expand and develop Washington’s existing core bicycle circulation system into a comprehensive bikeway and pedestrian system, and incorporate it into both the city’s transportation and recreation system
 - a. Selectively modify *existing* city streets when financially feasible, to include bicycle accommodations that are appropriate to traffic conditions; and add sidewalks and non-motorized connectors between cul-de-sacs and other barriers as appropriate.
 - b. Strive to ensure that *new* local, collector, and arterial roads are not only adequate for motor vehicles but also include provisions for bicycle and pedestrian movement.
 - c. Utilize, to the extent feasible, active and inactive rail corridors, utility/drainage corridors, and public lands for the development of multipurpose trails to help interconnect the system.

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d. Strive to ensure that the network of linear trails and on-street bikeways is sufficient to enable bicycle and pedestrian movement between most residential, institutional, and commercial/retail land uses.

e. Adhere to appropriate federal and state design guidelines and standards for the design of bicycle/pedestrian facilities.

f. Coordinate development activity to maximize the partnering benefits available through the Transportation Enhancements Program and other funding sources such as Safe Routes to Schools.

2. Establish Programs to Effectively and Safely Use the Bicycle and Pedestrian System

a. Establish a Bike/Ped Program Task Force (BPPTF), made up of representatives from the Police department, local schools, businesses and the community at large, to oversee development of programs promoting effective usage of the system. Solicit involvement from the business community and large employers in particular.

b. Meet regularly to oversee the implementation of all programmatic aspects of the Bikeable Walkable Community Plan.

c. Support the Police Department in the enforcement of all applicable state laws regarding bicycle operation and road sharing, and in the development of additional local ordinances as appropriate.

d. Educate cyclists on the safe usage of roads and trails.

e. Educate both bicyclists and motorists on road-sharing techniques.

f. Encourage bicycle usage and walking for transportation, recreation, health and fitness purposes.

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- g. Educate and encourage pedestrians regarding safe, healthy and effective walking habits.

 - f. Encourage bicycle usage and walking for transportation, recreation, health, and fitness purposes.

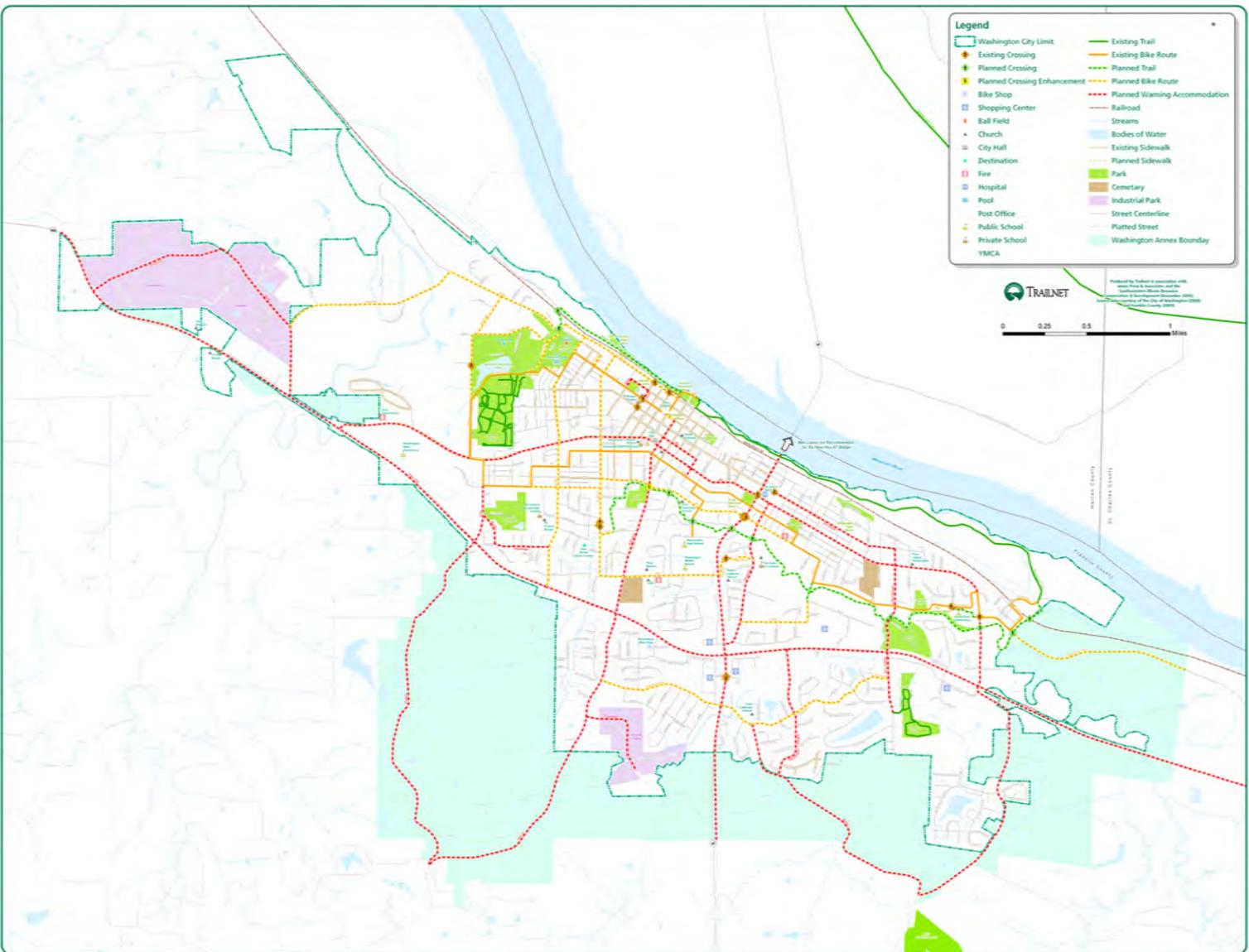
 - d. Educate and encourage pedestrians regarding safe, healthy and effective walking habits.

B. Bicycle/Pedestrian Facility Components

1. Introduction

The physical elements of the Washington Bikeable Walkable Community Plan are identified in this section. The principal components – trails and on-street facilities - are shown on the attached map (Illustration 37), with detailed elements as described thereafter.

37. The Washington Bikeable Walkable Community Plan



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2. Trails

Several greenway and trail opportunities should be pursued as identified on the following page. Major recommendations include trails along Washington’s west riverfront, a portion of the Busch Creek corridor, and Class I trail accommodations on the proposed new Missouri River Bridge.

Rotary Riverfront Trail Extension. The extension of the Rotary Riverfront Trail westward to a new terminus at the western end of the riverfront would achieve a direct connection to City Ball Park, Bernie Hillermann Park, Lakeview Park, and the YMCA. Independently, each of these facilities is a major activity generator in its own right, and collective annual usage is in the tens of thousands. The extension would also provide a substantially improved civic and tourism asset for Downtown Washington which alone experiences very heavy annual visitation.

Busch Creek Greenway and Trail . The designation of Busch Creek as a greenway and trail has been a component of at least two previous city plans. The element was included in the city’s 1999 Bicycle Facilities Plan and subsequently in its 2003 Comprehensive Plan. A 3.1 mile trail along the eastern portion of Busch Creek is proposed for development in the present plan. This facility would provide a major new amenity for upscale adjacent residential neighborhoods as well as a connection to Burger Park and facilitated access to the Rotary Riverfront Trail. The development of these greenways and trails reflect an increasing awareness of the strong interrelationships between natural corridors, non-motorized transportation infrastructure, and recreation facilities.

Bicycle Facility on Proposed New Missouri River Bridge. As with Busch Creek Greenway/Trail, a trail component on the proposed new Missouri River Bridge has been tentatively planned for many years. The facility, coupled with on-road improvements to a segment of Highway 47 in Warren County, is a critical component of Washington’s strategy to provide a bikeable connection to the Katy Trail.

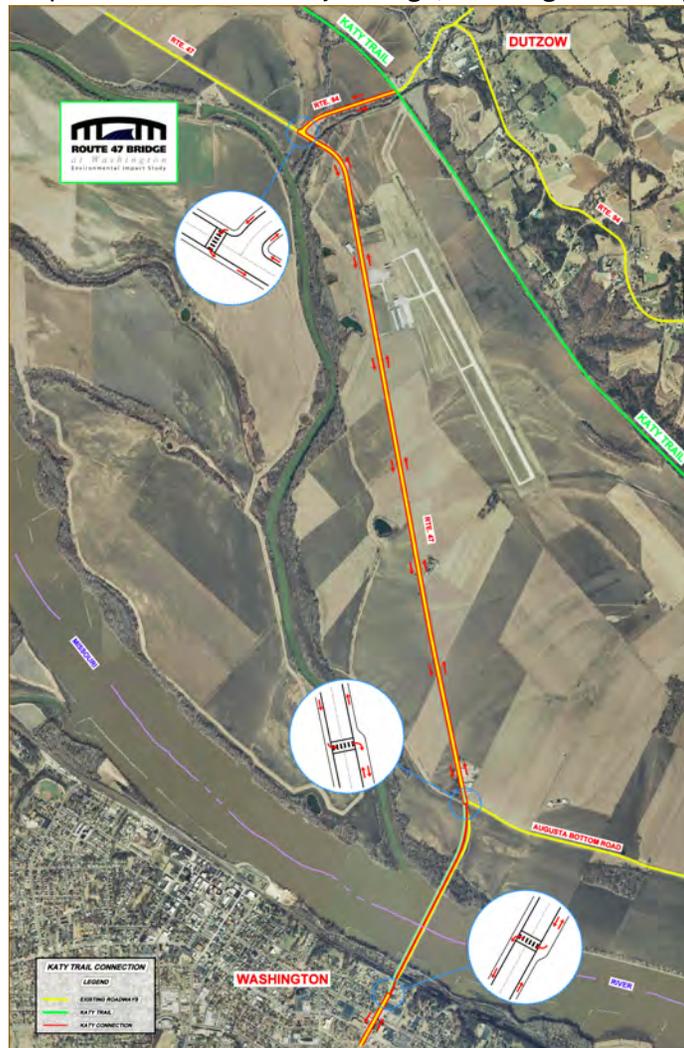
The overall planned trail/greenway system in Washington alone is more than five miles in length, with approximately 5 additional miles of trail connectivity planned by MoDOT on the new bridge and along Highway 47 to the Katy Trail. With connectivity to an expanding core bicycle

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 circulation system, the city will be well served with significant recreational destinations from any point within its municipal boundary. The system would also help to sustain property values, an outcome that is occurring elsewhere where longer trail systems exist. The specific trail/greenways are identified in the table and aerial photo below. (Refer to Figures 38, 38a and 38b).

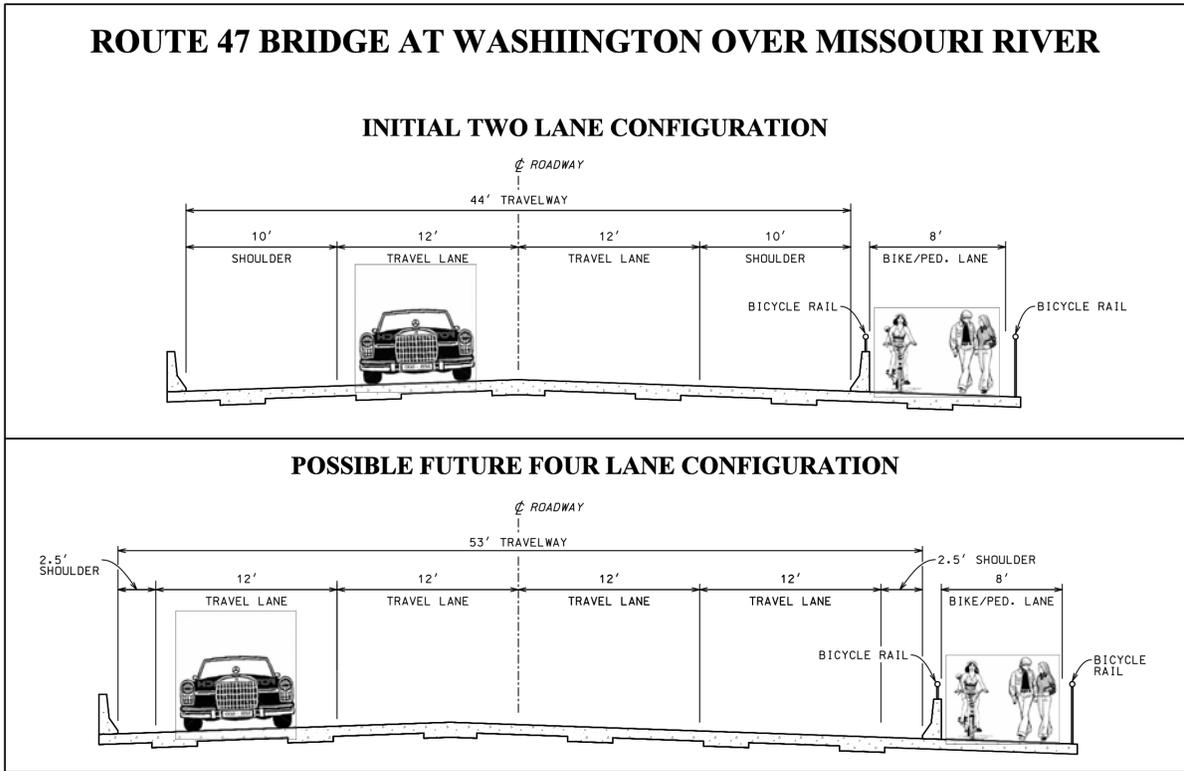
38. Planned Trails

Type	Street Label	Length (ft)	Length (mi)	Limit To	Limit From
Trail	Busch Creek Trail - Phase I	3,492	0.7	International	5th
Trail	Busch Creek Trail - Phase II	6,814	1.3	Hwy 47	International
Trail	Busch Creek Trail - Phase III	6,023	1.1	12th	Hwy 47
Trail	Camp Connector	634	0.1	Camp	9th
Trail	Hwy 47 Bridge	2,571	0.5	Hwy 47	Hwy 47
Trail	Rotary Riverfront Extension	5,419	1.0	Main	Lafayette
Trail	South Point Connector	997	0.2	Southbend	5th
7	Trail Totals:	25,950	4.9		

38a. Proposed MoDOT Bikeway Linkage, Washington to Katy Trail



38b. Proposed New Bridge Section



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3. On-Street Bikeways

Purpose and Intended Users. Washington’s on-street bikeway system will consist primarily of treatments intended to make conditions safer for bicycle travel and to facilitate connectivity to destinations including city parks, other public facilities, retail areas, job centers and others. The primary intended users of this system are experienced and casual adult cyclists, and teenage riders who could most appropriately use an on-street bikeway system and who are comfortable sharing the road with motor vehicles. The arterials and collectors within this system are not intended for child riders who, under the supervision of their parents, should use other elements of the system including trails, sidewalks (in accordance with AASHTO bikeway guidance), and low volume residential streets.

The city’s existing on-street core bikeway system should be further expanded to provide alternative transportation facilities with interconnections to activity generators as well as the existing and planned trail system. The system will also help to reduce or completely eliminate the need for some motor vehicle trips. For each selected street segment shown in the following tables, a recommendation is made regarding whether to use a formal bikeway treatment or an accommodation treatment, using the typology identified in Illustration 39 following this section.

This information can be used as a guide during the design-engineering process to develop the system. It is essentially consistent with the bicycle facility policy material and typical sections in the Missouri Department of Transportation’s MoDOT Project Development Policy Manual. (Refer to Appendix C). The typology is also based on information provided by the Pedestrian and Bicycle Information Center (PBIC).¹ Selected speed-volume matrices and charts from the PBIC which form the basis of the typology have been included in Appendix D. Considerable portions of the MoDOT and PBIC material also reflect guidelines found in the Guide for the Development of Bicycle Facilities, published by the American Association of State Highway and Transportation Officials (AASHTO). They are also supported by bikeway signage standards defined in the Manual on Uniform Traffic Control Devices (MUTCD). This material comprises a substantial and growing body of information establishing acceptable on-street bikeway design practices. It should be

¹ Pedestrian and Bicycle Information Center, Highway Safety Research Center, and University of North Carolina – Chapel Hill, Bicycle Facility Selection: A Comparison of Approaches, by Michael King. August, 2002

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noted that level of documentation provided in the appendices is considered appropriate for a conceptual planning level of analysis. The actual source material must be consulted for specific and detailed guidance during the design/engineering phase of work.)

39. On-Street Treatment Typology

Treatment Type	Applicability	Design Treatment ²
<p>Warning Accommodation on Shared Roadway.</p> 	<p>For busier roads with physical limitations that do not allow for widening in conformance with an official bicycle facility (such as a signed bike route or bike lane). Accommodation roadways are intended for use by experienced bicyclists who are comfortable traveling on roadways.</p>	<p><u>Urban Section</u> (i.e. with curbs): Wide outside lanes – 14’ recommended, not including gutter pan. (A 13’ wide outside lane would provide some level of accommodation when the preferred widths are not available.) 15’ is preferred where extra space is required for maneuvering such as on steep grades or at railroad crossings which are not perpendicular to the direction of travel. Widening can often be accomplished through lane re-striping, and by reducing the width of the inside lane or left turn lane.</p> <p><u>Rural Section:</u> (i.e. no curbs) A paved shoulder of any width up to 4’ is better than none at all; however, it cannot be signed as a bicycle facility. A width greater than 4’ is preferred, excluding gutter pans and rumble strips. 5’ is recommended from obstructions such as guardrails, signs, etc. Additional width is also recommended for higher bicycle traffic, motor vehicle speeds above 45 mph, and for higher truck/bus traffic.</p> <p><u>Warning Signage:</u> “Share the Road with Bicycles” signs every 1/4-mile.</p>

² Consult MoDOT Policy document, PBIC, AASHTO Guide, and MUTCD for specific design guidance and standards.

39. On-Street Treatment Typology (cont'd.)

Treatment Type	Applicability	Design Treatment ³
<p>Bicycle Lane (Class II Bikeway)</p>   	<p>For busier roads with higher speeds and traffic volumes, including collectors and arterials with an urban or rural section. (Where roads may not be of sufficient width to enable the installation of bicycle lanes, consider reductions in vehicle speeds and/or traffic volumes to accommodate bicycles as per Type a treatment.)</p> <p>“Busier road” is defined as either a road with permitted speeds of up to 35 mph and volumes of 10,000 + vehicles per day, or permitted speeds of 40 mph+ and volumes of 1200+ vehicles per day.</p>	<p><u>Urban Section</u> (i.e. with curbs): Min. 5’ shoulders with 5’ striped bicycle lanes (5’, 12’, 12’, 5’). Widen shoulder on busier roads to provide more separation between motor vehicle lane and bike lane.</p> <p><u>4-lane Rural Section</u>: Min. 8’+ shoulders with 5’ striped bicycle lanes (5’, 3’, 12’, 12’, 12’, 12’, 3’, 5’). Widen shoulder to provide more separation between motor vehicle lane and bike lane.</p> <p><u>2-lane Urban Section</u>: Min. 5’ striped bike lane, excluding gutter pan. With curb parking, add 5’ bike lane between parking and motor vehicle lane. (Min. 13’ between curb and motor vehicle lane, including gutter pan.)</p> <p><u>4-lane Urban Section</u>. Min. 5’ striped bike lane, excluding gutter pan. With curb parking, add 5’ for bike lane between parking and motor vehicle lane. (Min. 13’ between curb lane and motor vehicle lane, including gutter pan.)</p>
<p>Bicycle Route - Signed Shared Roadway (Class III Bikeway)</p>	<p>Bicycle routes should be so-marked if they are continuous and meet standards identified in the AASHTO publication, “Guide for the Development of Bicycle Facilities,” and if they are at least one mile long. Shorter bike routes may be marked if they connect with other bike routes.</p>	<p>14’ outside lanes, “Bicycle Route” and “Share the Road with Bicycles” Signs.</p>

The full listing of Washington street segments and recommended treatments keyed to this typology is provided on the following page (Illustration 40). Also see the previously referenced plan map, Illustration 37. The street listing includes state/county-maintained roads, and it is recommended that the city encourage the development of bicycle accommodations on these facilities as well.

Interconnectivity with Warren County is an important consideration. Although the Washington and Warren County are jurisdictionally separate, interconnection is a ‘win-win’ for both due to several factors:

- The Katy Trail’s location in Warren County and its prominence as the longest rail-trail in the nation. (The Missouri Department of Natural Resources reported annual trail visitation about 300,000 persons in 2001. Usage since that time is believed to be dramatically higher.)
- Downtown Washington’s significance as the largest tourist destination along the Katy Trail between Jefferson City and St. Charles, and the strong desire by trail users to have access to such destinations.
- The City’s compelling potential as a point of origin for trips to the Katy, which means that the city can generate new trips to the Katy thereby helping to seed commercial activity not only for itself but also in Warren County.
- The New Missouri River Bridge. Eventual replacement of the old Missouri River Bridge at Highway 47 with a new bicycle compatible structure will have eliminated the most significant barrier to the potential for interconnection.

In order to achieve a connection and prior to completion of the new bridge, several steps should be considered by other jurisdictions: a) The installation of bikeway improvements along Highway 47 (MoDOT); b) Area or county-wide bicycle facility planning (Warren County); c) Re-establishment of Augusta Bottom Road in its entirety, or selective improvements to enable bicycle access. These steps and the subsequent development of facilities would provide direct cycling access from Washington to the Katy trailhead at Dutzow, as well as to the trailhead at Augusta, providing significant new economic development opportunities for Dutzow and possibly Marthasville as well.

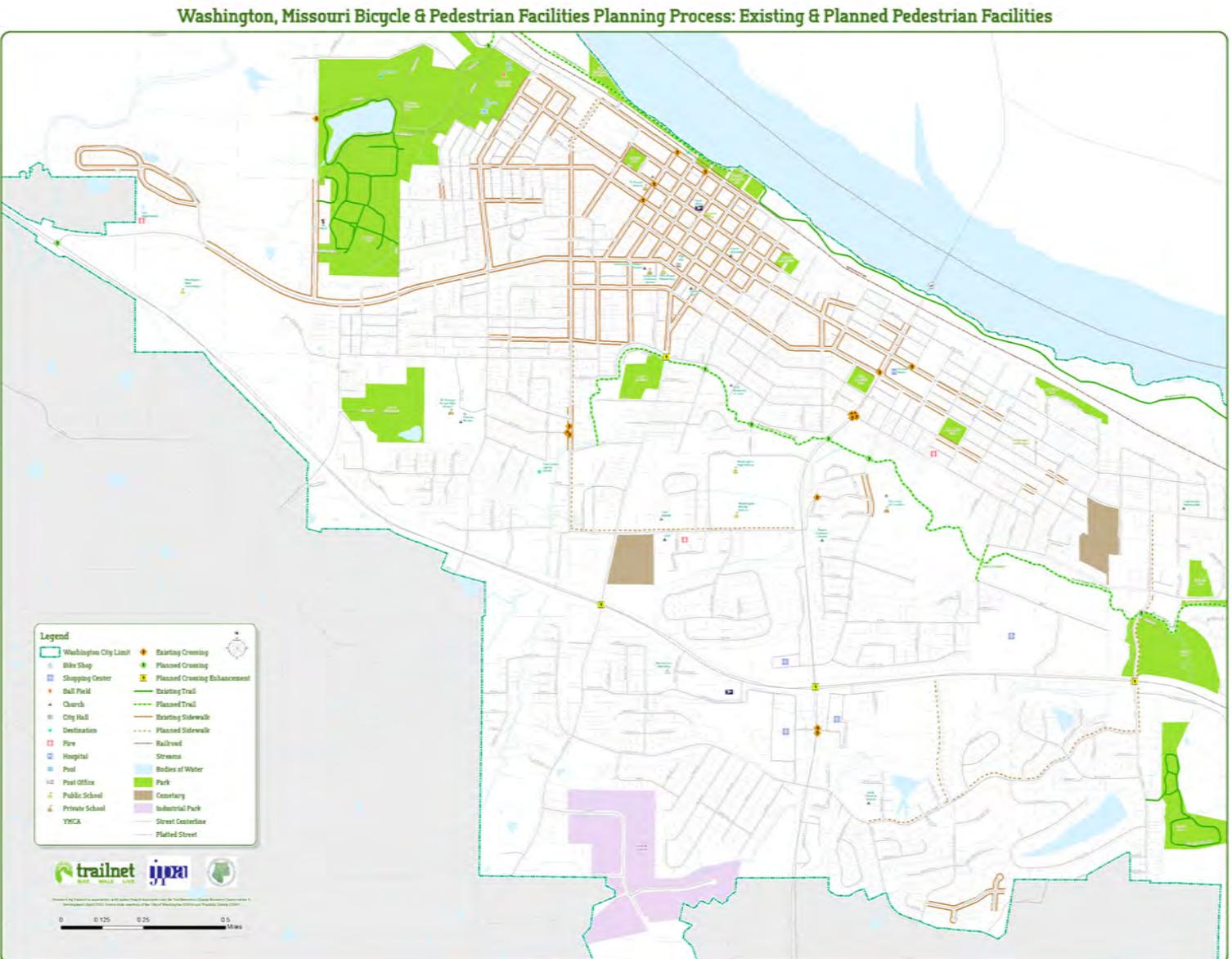
40. On-Street Segments and Recommended Treatments

Type	Street Name/Label	Length (ft)	Length (mi)	Limit To	Limit From
Bike Route	12th	460.81	0.09	Stafford	Busch Creek Trail
Bike Route	14th	3,740.91	0.71	Stafford	Hwy 47/Franklin
Bike Route	2nd	313.75	0.06	Lafayette	Jefferson
Bike Route	3rd	8,140.98	1.54	Jefferson	International
Bike Route	8th	6,541.32	1.24	Henry	Stafford
Bike Route	9th	2,175.94	0.41	Stafford	Klingsick
Bike Route	Bernard	1,420.42	0.27	Park	Main
Bike Route	Bieker	1,180.76	0.22	Hwy 47/Franklin	Lexington
Bike Route	Camp	664.67	0.13	Karen	Camp Connector/Rose
Bike Route	Duncan	600.34	0.11	Hwy 47/Franklin	Duncan Heights
Bike Route	Front	4,255.25	0.81	Tiemann	Lafayette
Bike Route	Grand	1,999.23	0.38	Lakeshore	Park
Bike Route	High	587.01	0.11	Front	2nd
Bike Route	High	6,714.14	1.27	Hwy 100	Esther
Bike Route	Hwy 100	78,466.74	14.86	Judy	High
Bike Route	Hwy A	2,173.95	0.41	Steutermann	Hwy 100
Bike Route	International	3,335.60	0.63	3rd	Hwy 100
Bike Route	Jefferson	6,442.31	1.22	Hwy 100	2nd
Bike Route	Karen	2,122.03	0.40	Madison	Camp
Bike Route	Lakeshore	637.71	0.12	Veterans	Tiemann
Bike Route	Lexington	2,540.11	0.48	Bieker	Lake Washington
Bike Route	Madison	4,914.80	0.93	Hwy 47/Franklin	5th
Bike Route	Main	4,012.25	0.76	Westlink	Tiemann
Bike Route	Old Hwy 100	2,871.90	0.54	Franklin County Plan	Busch Creek Trail
Bike Route	Park	2,610.92	0.49	Tiemann	Grand
Bike Route	Rabbit Trail	1,914.97	0.36	Hwy 100	Wenona
Bike Route	Rainbow	924.46	0.18	Madison	Duncan Heights
Bike Route	Stafford	7,079.68	1.34	Front	14th
Bike Route	Steutermann	4,002.78	0.76	Hwy A	Hwy 47/Franklin
Bike Route	Tiemann	1,378.88	0.26	Front	Veterans
Bike Route	Wenona	2,319.94	0.44	Lake Washington	Rabbit Trail
Bike Route	Westlink	5,646.66	1.07	Main	Bluff
32	Bike Route Totals:	172,191.19	32.61		
Warning Accommodation	5th	4,417.37	0.84	Hwy 100	Grand
Warning Accommodation	5th	17,019.36	3.22	Clay	Southbend
Warning Accommodation	5th	2,172.76	0.41	Old Hwy 100	Hwy 100
Warning Accommodation	Bieker	1,964.72	0.37	Washington Heights	Lexington
Warning Accommodation	Bluff	5,498.22	1.04	Vossbrink	Hwy 100
Warning Accommodation	Chamber	2,921.53	0.55	Hwy A	terminus
Warning Accommodation	Clay	1,827.18	0.35	Hwy 100	9th
Warning Accommodation	Hwy 47/Franklin	12,002.46	2.27	Riverfront Tail	White Oak
Warning Accommodation	Hwy A	3,336.04	0.63	Logan	Steutermann
Warning Accommodation	Point	6,435.80	1.22	Goodes Mill	Hwy 100
Warning Accommodation	Pottery	1,353.60	0.26	Holtgrewe	Hwy 100
Warning Accommodation	Vossbrink	4,348.57	0.82	Bluff	Hwy 100
Warning Accommodation	Washington Heights	4,289.59	0.81	Hwy 100	Bieker
Warning Accommodation	Westridge	1,718.47	0.33	Wildey	High
Warning Accommodation	Wildey	1,055.66	0.20	Clay	Westridge
15	Warning Accommodation Totals:	70,361.33	13.33		
47	Grand Totals:	242,552.52	45.94		

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4. Pedestrian Facilities

Washington should continue with implementation of ongoing citywide sidewalk improvements consistent with its present policy. A goal-oriented policy should also be developed that provides for stepped-up pedestrian facilities in mixed-used areas, pedestrian-oriented shopping areas, areas where there are emerging transects between key residential and commercial or industrial areas, and in other special locations where there presently are significantly higher levels of pedestrian activity or where such activity is anticipated. (Refer to Figure 40a.)

40a. Planned Pedestrian Facilities



Stepped-up improvements for special areas could incorporate a variety of design elements including: Wider sidewalks, curb extensions, shorter vehicular turn radii, crosswalks, medians, refuge islands, modification of vehicle sight lines, management of traffic movement including signal phasing to improve crossing conditions, speed tables with special pedestrian crossing treatments, information signs, special signals, pavement markings, and other improvements. A comprehensive treatment of this subject can be found in the document titled, Designing Sidewalks and Trails for Access, Part II: Best Practices Design Guide; published by the U.S. Department of Transportation, FHWA.

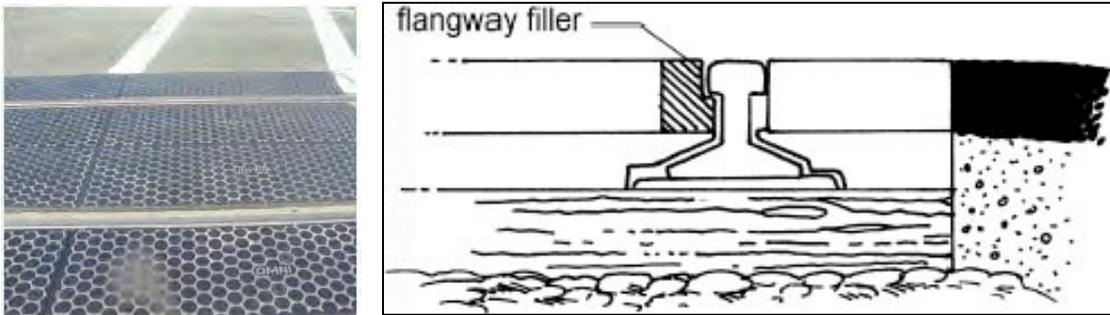
Washington’s Downtown Riverfront presents unique challenges - and opportunities - within a prosperous setting of shops and restaurants located on one side of the heavily used Union Pacific rail corridor with its AMTRAK station, and the heavily used Rotary Riverfront Park and Trail on the other. A key issue here is the existing rail crossing – under U.P. jurisdiction - which is underdeveloped, is used by at least three transportation modes (motor vehicles bicycle, and pedestrian), and which does not presently meet design and aesthetic benchmarks that are evolving along the public right-of-way in this unique part of the City.



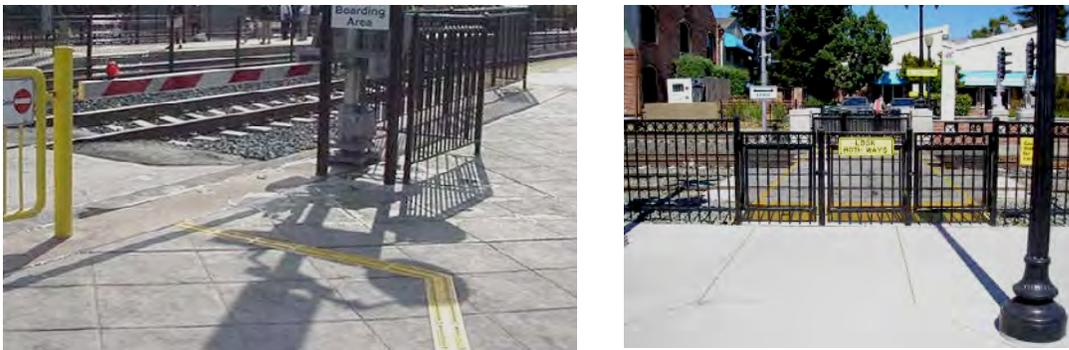
40a. The existing crossing – controlled by U.P. – has experienced increased user conflicts and does not presently meet design and aesthetic benchmarks that are appropriate for a riverfront of this caliber.

While a pedestrian bridge linking the two sides was studied several years ago, its considerable development cost may prove to be unaffordable without substantial federal assistance at a time when there may be other pressing capital needs. The view has also been expressed that the proposed location of the bridge at the foot of Market Street might not be the most advantageous for the majority of pedestrians who would be more likely to use Lafayette as a crossing point given its location in relation to area attractions.

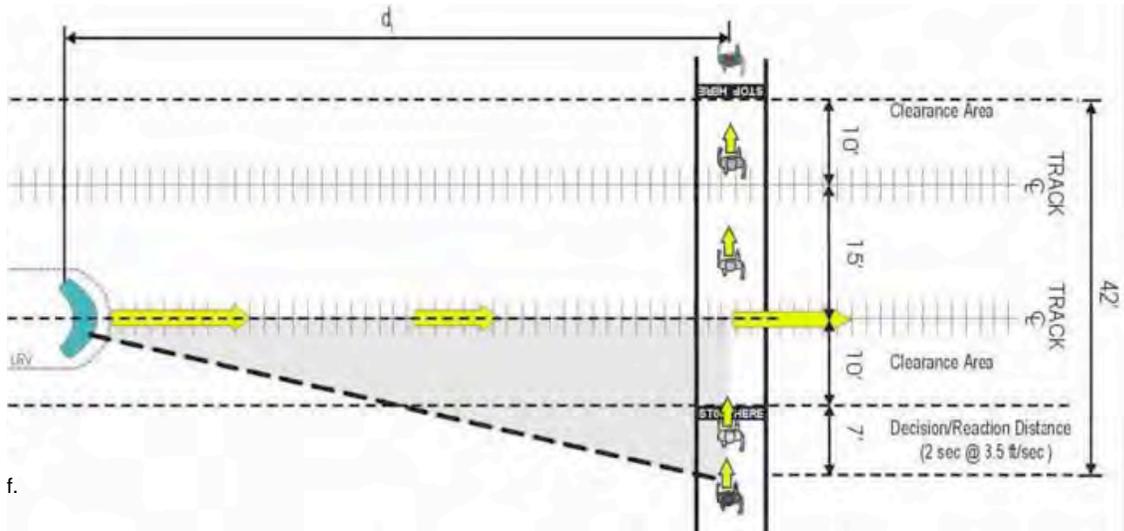
.....
If the bridge concept proves to be infeasible, it is recommended that the City commission a separate new master plan for substantial modifications to the existing at-grade crossing. This approach would result in a significant and dramatic improvement consistent with the evolving aesthetics and design along one of Washington’s signature attractions – its scenic riverfront. The study should utilize and incorporate current best practices for at-grade rail crossings to result in a plan that is unique to the City. Example design elements from other sources that would be of potential use here are shown below and on the following page:



40 b. c. left to right: Use of a rubber tactile surface, coupled with a flangeway filler provide an attractive alternative to the existing surface and would introduce a unifying design element enhancing overall appearance. (Images from previously cited FHWA document.)



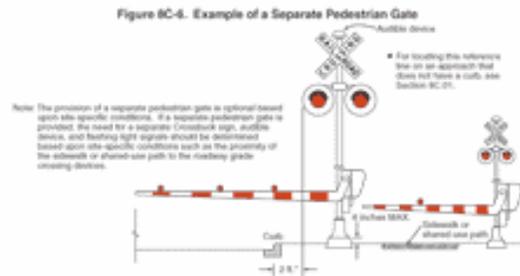
40 d. e. left to right: Special pavers as well as architectural-quality fencing and lighting contribute to a unified design. (Images from [Pedestrian Rail Crossings in California](#), published by the California Public Utilities Commission.)



f.



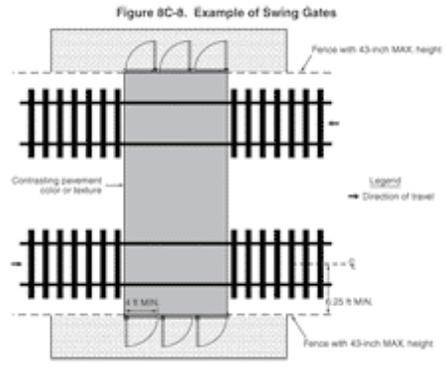
j.



g.



i.



h.

40 f. to j. clockwise from top: This sight triangle concept from another source is potentially applicable to the rail crossing in Washington. It illustrates the typical sight distance required in order to improve safety. Separate drop and swinging gates are available to control the crossing movements of pedestrians and bicyclists. Special warning signs are also available which further enhance pedestrian and bicyclist safety at busy crossings. A master plan for the crossing could incorporate these or other similar elements into a unified, attractive design that would establish a substantially improved – and highly appealing – crossing. (Images from [Pedestrian Rail Crossings in California](#), published by the California Public Utilities Commission.)

C. Implementation Strategy

1. Pre-Engineering Opinion of Cost to Develop the Washington Bikeway System

This section provides a preliminary opinion of cost to develop the bicycle facility system identified in the previous section. This is essentially a rough order-of-magnitude (ROM) estimate using the segment data shown in the preceding illustrations. It is based on actual development costs of other bikeway projects in the St. Louis region. The level of estimation is considered to be appropriate for a planning study, which cannot reflect the more precise estimates that would be developed during the subsequent design/engineering phase of work. Moreover, it cannot account for future conditions in the construction market, which will be a factor in determining actual price outcomes during the bid phase of work. (Refer to Illustrations 41 and 42 on the following pages.)

The Bikeable-Walkable Community Plan for the City of Washington, Missouri -
 II. Bikeable Walkable Community Plan (Final Draft, July 21, 2011)

41. Preliminary Opinion of Cost Detail Sheet

Type	Street Name/Label	Length (ft)	Length (mi)	Limit To	Limit From	Cost (retro)	Cost (new)
Bike Lane	Hwy 47	14,714	2.8	Hwy 94	Hwy 47 Bridge	n/a	n/a
Bike Lane	Hwy 94	1,911	0.4	Katy Trail	Hwy 47	n/a	n/a
2	Bike Lane Totals:	16,625	3.2			n/a	n/a
Bike Route	12th	461	0.1	Stafford	Busch Creek Trail	\$304	\$0
Bike Route	14th	3,741	0.7	Stafford	Hwy 47/Franklin	\$2,469	\$0
Bike Route	2nd	314	0.1	Lafayette	Jefferson	\$207	\$0
Bike Route	3rd	8,141	1.5	Jefferson	International	\$5,373	\$0
Bike Route	8th	6,541	1.2	Henry	Stafford	\$4,317	\$0
Bike Route	9th	2,176	0.4	Stafford	Klingsick	\$1,436	\$0
Bike Route	Bernard	1,420	0.3	Park	Main	\$937	\$0
Bike Route	Bieker	1,181	0.2	Hwy 47/Franklin	Lexington	\$779	\$0
Bike Route	Camp	665	0.1	Karen	Camp Connector/Rose	\$439	\$0
Bike Route	Duncan	600	0.1	Hwy 47/Franklin	Duncan Heights	\$396	\$0
Bike Route	Front	4,255	0.8	Tiemann	Lafayette	\$2,808	\$0
Bike Route	Grand	1,999	0.4	Lakeshore	Park	\$1,319	\$0
Bike Route	High	587	0.1	Front	2nd	\$387	\$0
Bike Route	High	6,714	1.3	Hwy 100	Esther	\$4,431	\$0
Bike Route	Hwy 100	78,467	14.9	Judy (Western city limit)	Highway 100	\$51,788	\$0
Bike Route	Hwy A	2,174	0.4	Steutermann	Hwy 100	\$1,435	\$0
Bike Route	International	3,336	0.6	3rd	Hwy 100	\$2,201	\$0
Bike Route	Jefferson	6,442	1.2	Hwy 100	2nd	\$4,252	\$0
Bike Route	Karen	2,122	0.4	Madison	Camp	\$1,401	\$0
Bike Route	Lakeshore	638	0.1	Veterans	Tiemann	\$421	\$0
Bike Route	Lexington	2,540	0.5	Bieker	Lake Washington	\$1,676	\$0
Bike Route	Madison	4,915	0.9	Hwy 47/Franklin	5th	\$3,244	\$0
Bike Route	Main	4,012	0.8	Westlink	Tiemann	\$2,648	\$0
Bike Route	Old Hwy 100	2,872	0.5	Franklin County Plan	City Limit	\$1,895	\$0
Bike Route	Park	2,611	0.5	Tiemann	Grand	\$1,723	\$0
Bike Route	Rabbit Trail	1,915	0.4	Hwy 100	Phoenix Park Trail	\$1,264	\$0
Bike Route	Rainbow	924	0.2	Madison	Duncan Heights	\$610	\$0
Bike Route	Stafford	7,080	1.3	Front	14th	\$4,673	\$0
Bike Route	Steutermann	4,003	0.8	Hwy A	Hwy 47/Franklin	\$2,642	\$0
Bike Route	Tiemann	1,379	0.3	Front	Lakeshore	\$910	\$0
Bike Route	Wenona	2,320	0.4	Lake Washington	Rabbit Trail	\$1,531	\$0
Bike Route	Westlink	5,647	1.1	Main	Bluff	\$3,727	\$0
32	Bike Route Totals:	172,191	32.6			\$113,646	\$0
Sharrow	5th	2,173	0.4	Old Hwy 100	Hwy 100	\$0	\$1,738
Sharrow	5th	17,019	3.2	Clay	Southbend	\$0	\$13,615
Sharrow	5th	4,417	0.8	Hwy 100	Grand	\$0	\$3,534
Sharrow	International	2,810	0.5	5th	Hwy 100	\$0	\$2,248
Sharrow	Jefferson	5,495	1.0	Hwy 100	5th	\$0	\$4,396
5	Sharrow Totals:	31,915	6.0			\$0	\$25,532
Trail	Busch Creek Trail - Phase I	3,492	0.7	International	5th	\$0	\$174,581
Trail	Busch Creek Trail - Phase II	6,814	1.3	Hwy 47	international	\$0	\$340,696
Trail	Busch Creek Trail - Phase III	6,023	1.1	12th	Hwy 47	\$0	\$301,172
Trail	Camp Connector	634	0.1	Camp	9th	\$0	\$31,677
Trail	Hwy 47 Bridge	2,571	0.5	Hwy 47	Hwy 47	n/a	n/a
Trail	Rotary Riverfront Extension	5,419	1.0	Main	Lafayette	\$0	\$270,965
Trail	South Point Connector	997	0.2	Southbend	5th	\$0	\$49,850
6	Trail Totals:	25,950	4.9			\$0	\$1,168,942
Warning Accommodation	5th	4,417	0.8	Hwy 100	Grand	\$1,899	\$0
Warning Accommodation	5th	17,019	3.2	Clay	Southbend	\$7,318	\$0
Warning Accommodation	5th	2,173	0.4	Old Hwy 100	Hwy 100	\$934	\$0
Warning Accommodation	Bieker	1,965	0.4	Washington Heights	Lexington	\$845	\$0
Warning Accommodation	Bluff	5,498	1.0	Vossbrink	Hwy 100	\$2,364	\$0
Warning Accommodation	Chamber	2,922	0.6	Hwy A	terminus	\$1,256	\$0
Warning Accommodation	Clay	1,827	0.3	Hwy 100	9th	\$786	\$0
Warning Accommodation	Hwy 47/Franklin	12,002	2.3	Riverfront Tail	White Oak	\$5,161	\$0
Warning Accommodation	Hwy A	3,336	0.6	Logan	Steutermann	\$1,434	\$0
Warning Accommodation	Point	6,436	1.2	Goodes Mill	Hwy 100	\$2,767	\$0
Warning Accommodation	Pottery	1,354	0.3	Holtgrewe	Hwy 100	\$582	\$0
Warning Accommodation	Vossbrink	4,349	0.8	Bluff	Hwy 100	\$1,870	\$0
Warning Accommodation	Washington Heights	4,290	0.8	Hwy 100	Bieker	\$1,845	\$0
Warning Accommodation	Westridge	1,718	0.3	Wildley	High	\$739	\$0
Warning Accommodation	Wildley	1,056	0.2	Clay	Westridge	\$454	\$0
15	Warning Accommodation Totals:	70,361	13.3			\$30,255	\$0
60	Grand Totals:	317,042	60.1			\$143,902	\$1,194,474
						\$1,338,375	

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42. Rough-Order of Magnitude Cost Summary
(Refer to explanatory notes and to footnote ⁴)

Facility Type	Estimate (Rounded)
Bike Routes	\$114,000.00
Warning Accommodations	\$30,000.00
Trails	\$1,200,000.00
Total Rough Order of Magnitude Estimate	\$1,344,000.00

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2. Bicycle Project Prioritization

While each recommended project will play an important role in creating a comprehensive, interconnected system of bicycle and pedestrian facilities, certain projects carry greater importance in improving safety and accessibility, providing connections between residential neighborhoods and community destinations, and meeting the sited needs of the community. Bicycle facility projects have been prioritized according to weighted criteria identified during the planning process, which include proximity, connectivity, public feedback, and ease of implementation. This ranking system should not be used as a chronological schedule for project implementation; if the opportunity arises to undertake a recommended project, the City of Washington should capitalize on that opportunity regardless of project rank.

Proximity. Bicycle and pedestrian facilities in close proximity to local schools, transit stops, commercial activity centers, and public facilities such as parks and libraries are essential in creating a functional bicycle transportation network. They provide access to community destinations and encourage residents to incorporate bicycling and walking into their daily routines, whether it is a trip to school, the library, a park, or a local store. These criteria are listed in the prioritization matrix as items 1.1 through 1.4 (Illustration 40 on page 62).

Adjacent Residential Population (Criterion 2.1). Bicycle and pedestrian infrastructure in and around residential neighborhoods offers people an alternative mode of transportation to many of the previously identified community destinations. Recommended projects are scored according to their adjacent residential population, with greater importance given to projects that have the potential to affect a greater number of people.

Connectivity (3.1 through 3.4). Facilities that close an existing gap in the network, link to other routes, provide the most direct route choice, and connect Washington residents to regional destinations enhance the network's coverage and efficiency while also improving safety for cyclists and pedestrians.

Public Feedback (4.1) Through the public engagement process, residents of Washington have voiced their priorities, goals and ideas for improving the bicycle and pedestrian environment

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throughout the city. Priority is given to projects that have garnered considerable public support and to projects that address safety, access and connectivity issues identified by the public.

Ease of Implementation (5.1). A number of projects involve other entities such as Franklin County and MoDOT. or utility and railroad rights-of-way. These projects will require additional coordination with both governmental and non-governmental entities with regard to property or easement acquisition, design standards, project funding, or other considerations. There is also a significant number of projects located on City of Washington right-of-way and as such will be easier to implement. Many of the project under city jurisdiction are located on residential or collector streets and be important bikeways on which a large share of transportation-oriented bicycle trips will occur.

Illustration 43 on the following page shows the priority rankings for bicycle improvements. Segments over one mile in length, as well as shorter segments that warrant prioritization, have been included in the matrix. Project criteria described above are listed as 1.1 through 5.1.

4.3. Priority Rankings

The projects on this list represent the initial bicycle network recommendations for facilities over one mile in length, as well as a number of critical recommended or planned projects under one mile that warrant prioritization. The projects have been prioritized using a weighted scale that takes into account criteria determined by the City of Washington and the planning team, and identified through the public participation process. Number of schools and public facilities along the route, proximity to other community destinations, population of adjacent neighborhoods, connections to other bicycle facilities, projects identified as important by residents and stakeholders, and a number of similar factors have been quantified to determine a priority ranking system. This ranking system should not be used as a chronological schedule for project implementation. If the opportunity arises to undertake a recommended project, the City of Washington should capitalize on that opportunity regardless of project rank.

Project	Facility Type	Length (mi)	Project Limits	Projected Cost	Proximity to schools (K-12) Direct access to commercial destinations Proximity to public facilities Adjacent residential population Completes gap in bicycle network Connected existing and planned routes Directness of route Regional route Public feedback & support										Total score
					1.1	1.2	1.3	2.0	3.1	3.2	3.3	3.4	4.0		
5th Street	Warning Accommodation	4.47	Hwy 100, Hwy 100	\$ 10,152	32	5	22	20	5	24	5	0	50	163	
Busch Creek Trail	Multi-Purpose Trail	3.81	12th, Riverfront Trail	\$ 1,005,840	24	5	12	20	5	22	0	0	50	138	
Hwy 100	Bike Route	14.86	Judy, High	\$ 51,788	16	5	10	20	5	20	5	5	40	126	
Jefferson/Hwy A	Bike Route	1.63	2nd, Steuterman	\$ 5,687	16	5	10	16	5	18	5	0	40	115	
Hwy 47/Franklin	Warning Accommodation	2.27	Miss. River Bridge, White Oak	\$ 5,161	12	5	4	16	0	18	5	5	40	105	
Front	Bike Route	0.81	Tiemann, Lafayette	\$ 2,808	8	5	14	8	5	8	5	0	50	103	
3rd	Bike Route	1.54	Jefferson, International	\$ 5,373	16	5	18	16	0	6	5	0	35	101	
Rotary Riverfront Trail Extension	Multi-Purpose Trail	1.03	Mainy/Tiemann, Lafayette	\$ 270,965	8	5	14	8	5	10	0	0	50	100	
8th	Bike Route	1.24	Henry, Stafford	\$ 4,317	16	5	6	20	0	14	5	0	25	91	
Stafford	Bike Route	1.34	Front, 14th	\$ 4,673	20	0	14	16	0	14	5	0	20	89	
High	Bike Route	1.38	Hwy 100, Front	\$ 4,819	12	0	8	16	0	16	5	0	30	87	
Madison	Bike Route	0.93	Hwy 47, 5th	\$ 3,244	12	5	4	12	5	14	5	0	25	82	
Old Hwy 100	Bike Route	0.54	Busch Creek Trail	\$ 1,895	4	5	2	4	5	4	5	5	45	79	
International/Rabbit Trail	Bike Route	0.99	3rd Street, Wenona	\$ 3,465	4	5	6	8	5	12	5	0	25	70	
14th/Duncan/Rainbow	Bike Route	1.00	Stafford, Madison	\$ 3,475	12	5	4	12	5	8	5	0	15	66	
Main/Westlink	Bike Route	1.83	Tiemann, Bluff	\$ 6,375	0	5	4	4	5	8	5	0	25	56	
Steutermann/Lexington/Wenona/Bieker	Bike Route	1.90	Hwy A, Rabbit Trail	\$ 6,629	0	5	4	12	5	10	5	0	15	56	
Bluff/Vossbrink	Warning Accommodation	1.86	Hwy 100, Hwy 100	\$ 4,234	0	5	0	4	5	4	5	0	25	48	
Washington Heights	Warning Accommodation	0.81	Hwy 100, Bieker	\$ 1,845	0	5	0	8	0	6	5	0	15	39	
South Point	Warning Accommodation	1.22	Goodes Mill, Hwy 100	\$ 2,767	0	5	2	4	0	4	5	0	10	30	

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3. Pedestrian Project Prioritization.

Improving pedestrian connectivity, safety, access and convenience represent a key component of the plan. In order to prioritize pedestrian improvement, criteria have been developed based on public input gathered throughout the planning process. Feedback received at the public forums indicates a number of concerns related to the walking environment. The planning team has developed a typology to categorize improvements that address these concerns as follows:

- Additional trails to enhance community connectivity and provide additional recreational trail opportunities;
- Project that improve pedestrian safety and comfort at points where there are prominent barriers;
- Projects that provide continuous pedestrian facilities (sidewalks, crosswalks, pedestrian paths) along/across major and minor arterials, and along/across collector streets;
- Projects that connect residential neighborhoods to new and existing commercial activity and significant community destinations;
- Projects that improve general pedestrian safety, comfort and accessibility at signalized intersections along major arterials.

4. Funding Sources

The estimated costs to construct Washington’s proposed bikeway system are achievable with an appropriate funding and phasing strategy. The following is a listing of potential funding sources to implement this plan, along with an assessment of the degree of competitiveness.

Safe, Accountable, Flexible, Efficient Transportation & Equity Act: A Legacy for Users (SAFETEA-LU). Ten percent of Missouri’s Surface Transportation Program funds are required to be set aside for applicants to develop infrastructure in 10 non-motorized and tourist-related categories such as trails and greenways. Approximately 80:20 match. The program is administered by Missouri Department of Transportation (MoDOT) in cooperation with East West Gateway Council of Governments (EWCOG). The annual deadline has been in February. The new highway authorization is expected to be enacted during 2010 and it is possible that the enhancement program will be continued therein. Very competitive. (314 526-3578)

Surface Transportation Program (S.T.P.). The S.T.P. program is also administered by MoDOT through EWCOG on an annual basis, to fund local road and bridge projects. Bike facilities are an allowable expense. 80:20 match. Competitive. (314 421-4220)

Land & Water Conservation Fund (LWCF). Grants are available to city, counties and school districts for outdoor recreation facilities including trails. Projects have required a 55% match and require that the facilities remain for the purpose of public outdoor recreation in perpetuity. Funding levels vary depending on budget constraints. Typically, funding proposals are due in October and Missouri Department of Natural Resources-Division of State Parks administers the program. The funding is provided through US Department of Interior, National Park Service. (573 751-0848)

Recreational Trails Program. Grants are available for motorized and nonmotorized trail development, renovation, trailheads and maintenance equipment. Projects require a 20% match and are also administered by the Missouri Department of Natural Resources-Division of State Parks. Funding provided by Federal Highway Administration. Proposals for this past round (2006) were due in June. Grant requests up to \$100,000 are eligible and applicants can include city, counties, schools, private, non-profit and for-profit businesses. Approximately \$1.3 million was available last grant round. (573 751-0848)

Parks/Stormwater Tax. Since 1995, more than 90 Missouri communities and counties have passed legislation allowing a local Stormwater/Parks Sales Tax. The program permits the imposition of a sales tax of not more than 1/2% on retail sales within a jurisdiction. The tax must be approved by a simple majority of local voters, and proceeds managed from a local parks and storm water control sales tax fund. This program has been a strong source for local matching funds to leverage additional state and federal grant funding, extending the impact of trail development dollars even further. For more information on the provision, contact the Missouri Parks and Recreation Association (573 636-3828).

Municipal Park Grant. This program provides development funds for parks and trails to municipalities and is administered through the St. Louis County Municipal League. (314 726-4747.)

Safe Routes to School. Funding is available annually through the Department of Transportation targeting public and private schools, grades K 8. Infrastructure and behavioral projects are eligible and funding may cover up to 100% of project expenses. This includes public awareness campaigns, traffic education and enforcement, sidewalk improvements, and bicycle and pedestrian facilities within a two-mile radius of the school. For more information, contact MoDOT, or Trailnet (314 416-9930).

Local Funds. Approaching bikeway development from the perspective of return-on-investment, the city can maximize the use of local tax revenue by utilizing it as a match to obtain Enhancements and other external funds. At the very least, for every three dollars of local investment, the community can receive seven dollars in external funding to build the bikeway system. Another important measure of return-on-investment relates to the fact that Washington will not only develop major infrastructure improvements to its park system, but road improvements for all types of users including automobiles can also be obtained. The net return to the taxpayer will be a more efficient parks and roads system.

The city’s transportation sales tax and perhaps a bond issue should be considered as sources to enable local investment.

Developer Contributions. Contributions or exactions from the developer community, as described in Section 3 on the following pages, should be a central element of the funding strategy relating to any new residential or commercial activity.

The chart on the following page provides suggested funding sources and uses to implement the program. Through annual review of funding streams and revisions as necessary, this spreadsheet can be used as an implementation and management tool. (Table 44.)

5. Plan Adoption and Regulatory Actions

The following steps should be taken to implement the Washington Bikeable Walkable Community Plan:

- a. Local adoption by City Council. Adoption of the plan as a guide for local policy development will help to ensure its implementation.

- b. Park Land Dedication Program. The cities should consider establishment of a parkland set-aside or fee-in-lieu-of program, which would require developers to provide for not only the development costs of roads, but also to contribute toward the development of the bikeway system including greenways and trails. Greenways are essentially linear parks, and have long been recognized as important elements in the improvement of recreation and quality of life. They are a type of infrastructure that also directly supports transportation choices, health and vitality, and the residential and commercial environment in which they exist.

There is also considerable documented and anecdotal evidence that trails and greenways are good for the real estate development industry in that they positively affect property values. Examples include the following:

- *Positive economic effects of a greenway corridor arise because of an increase in the value of taxable properties adjacent to the greenway. In an urban setting, this is almost beyond argument since the value of land for office buildings and apartment houses or condominiums will be enhanced to some degree by adjacency to any public amenity of this sort.*⁵

- *(Burke Gilman Trail, Seattle, WA.) ... today, agents routinely advertise properties as being on or near the trail. According to the report (by the Seattle Engineering Department), ‘property near ... the Burke-Gilman Trail is significantly easier to sell and, according to real estate agents, sells for an average of 6 percent more as a result of its proximity to the trail. Property...’*⁶

.....
• ...In suburban areas of Chicago, Tampa, Washington D.C., Seattle, and elsewhere, home-sale advertisements promote the properties' proximity to trails as a selling point.⁷

• (Greenways in general) ... increased tax revenues are usually generated by an increase in property values on land near the greenway...⁸

• Downtown Minneapolis Central Riverfront is coming back, and it's parkland that's helping to make it happen. The \$40 million we've spent on parkland acquisition and development in the central river area is leveraging nearly ten times that amount in private expenditures for housing, office space, and commercial development.⁹

• 'I strongly believe that the development of Downtown Park (Bellevue, Washington) was a catalyst for the residential development around it,' said Matthew Terry, director of the Bellevue Department of Community Development. Developers confirmed this view. One property owner said that the close proximity of Downtown Park to his parcel was critical to his decision to buy the land. When Kevin Lynch bought his parcel in 1980, he thought he was lucky to be close to a major regional shopping mall. Then when Downtown Park was developed next to his site, 'that was like winning a lotto ticket,' said Lynch. 'It's a blue-ribbon location to be next to a regional mall and a park.'¹⁰

• (Pinellas Trail/Greenway, Pinellas County, Florida) ... In Oldona, adjacent to the trail, an upscale townhome community was developed that uses the word trail in its name... In addition, although firm figures on the trail's impact on nearby property values are not yet available, anecdotal evidence points to higher prices, which would yield higher tax receipts for the county. 'Both houses and commercial property along the trail are certainly more marketable,' said Scott Daniels, president of Pinellas Trails, Inc. 'Real estate ads mention proximity to the trail as one of the selling points.'¹¹

It is clear that, if homeowners gain, then so do the industries that develop homes that are made more marketable because of the availability of bicycle and pedestrian facilities. Therefore, it is appropriate for developers to participate in the parkland dedication program as they already do in other communities.

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c. Additional Land Use and Zoning Recommendations. A variety of additional regulatory changes should be considered including the following:

- Broader Uses for Floodways and Floodplains. A floodway/floodplain overlay should be considered in existing districts where there are creeks, streams, and other low-lying areas. Here, greenways, trails, and park nodes would be allowed as appropriate uses, as well as a variety of other uses that are entirely consistent with these areas, such as interpretive trails, nature preserves, wildlife refuges, ecological corridors, and other low impact uses. The overlay could allow such uses by right, or as special uses to be regulated on a case-by-case basis. The net effect of this designation would be to help facilitate the eventual use of floodways and floodplains for a wider variety of activities considered vital in today’s progressive communities.

- Limiting or Managing New Cul-de-Sacs. Subdivision ordinances should discourage the use of cul-de-sacs. When cul-de-sacs are used, non-motorized trail pass-throughs (similar to crosswalks but somewhat wider) should be required so that adjacent neighborhoods can be interconnected. These pass-throughs should be created during the review of conceptual subdivision plans, prior to actual platting, and should be located on their own right-of-way. Appendix G provides additional information on the emerging importance of connected neighborhoods and example ordinances that limit cul-de-sacs.

- Review/Modify Street Specifications. The city’s development codes provide for a 40-foot-wide section with two 12-foot through lanes and two 8-foot parking lanes. This limitation does not allow for the provision of wider vehicular or curb parking lanes that would enable establishment of an on-street bikeway system on collector roads. The preferred approach would be to amend this standard to allow for slightly wider vehicle lanes or curb parking lanes to permit either 4-foot wide bike lanes in both vehicular directions or a signed bike route system. An alternative to this approach would be to require developers to allow for establishment of a multipurpose path on its own right-of-way as a part of the subdivision platting process. This requirement is similar to that for sidewalks except that standards shown in the AASHTO Guide for the Development of Bicycle Facilities would be required which would include a minimum 8-foot wide facility. The path could be constructed of either concrete or asphalt. Appendix H provides example easement language from the City of Elgin, Illinois.

- Review Pedestrian Facility Requirements. Require sidewalks in all new developments on at least one side of the street with minimum five-foot widths on residential streets, five- to six-foot widths on collectors and arterials, and wider sidewalks in higher density commercial districts. The city should also consider establishing a grant or revolving loan program to assist homeowners with ongoing sidewalk maintenance.
- Sidewalk Buffers. Residential streets should be separated from sidewalks by grass and landscaped strips to provide a more effective buffer from auto traffic. (Studies show that these buffers also have a traffic calming effect.)
- Shorter Corner Radii. Use shorter radius corners to slow vehicle turning movements and facilitate pedestrian crossing.
- Ongoing Review of Best Design Practices. Continue to review best design practices for multimodal transportation and traffic calming, as this is a rapidly evolving field.

All of these requirements should be communicated at the time of first contact with developers, and recommended pedestrian and bicycle facility improvements should be shown in all subdivision documents submitted to the City.

6. Encouragement, Education and Enforcement

Bicycling has been one of the most popular forms of recreation in the United States for a considerable period of time. Well over 35 million American adults ride regularly, and this number has been steadily increasing since 1983.¹² Many of these riders use public streets for recreational, and some utilitarian/commuting activity.

A variety of programs related to the encouragement, education and enforcement of proper bicycling behavior have been developed to facilitate usage of bicycles by adults and children. This section describes and recommends incentives to increase the safety and enjoyment of bicycle

usage in Washington. The recommendations are principally derived from several sources including Michael Replogle¹³ and the Bicycle Federation of America¹⁴. It provides a framework within which bicycles can be more easily considered as a mode option when transportation choices are made, and provides ways in which their use can be regulated for public safety and protection.

Encouragement Activities. Encouragement refers to a variety of strategies to invite the use of bicycles and walking. The following specific recommendations are made for Washington:

- a. Technical Advisory Committee. Create a Bicycle Pedestrian Technical Advisory Committee to provide ongoing guidance concerning implementation, safety, education, and promotion, and encourage involvement of other public, institutional and private parties. Wide representation from government and the private sector should be included.
- b. Brochure. Develop and distribute a brochure, which includes a map of the bicycle-pedestrian system and park system.
- c. Special Events. Sponsor special bicycle and walking events designed to use facilities being developed.
- d. Bike Lockers, Racks, and Shower Facilities. Encourage larger employers to provide bike lockers or racks, and to install showers to promote commuting.

Education Activities. This category addresses the need to learn the how-to's of bicycling in order to provide cyclists with skills to use trails and streets. Many bicycle education programs are school based. The National Highway Traffic Safety Administration (NHTSA) as well as the State of Missouri has developed materials for various school-age groups. Pre-school children are not introduced to the traffic environment unless accompanied by an adult. Traffic safety programs begin at the kindergarten through lower grade school levels; they emphasize simple stop and look techniques at mid block and at corners. Programs for older grade school children introduce them to more complex traffic challenges.

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The Bicycle Federation and Bike Centennial jointly developed a curriculum titled, Basics of Bicycling that is geared to the fourth grade. Education programs for older students are less prevalent, probably because busing programs prevent widespread use of bicycles as a primary mode of travel to schools, and because of the logistics involved in arranging after school training programs for these students. Many programs place emphasis on the common types of accidents associated with bicyclists: ride-outs from alleys, driveways and other mid-block locations; ride-outs at controlled intersections; motorist drive-outs and turn/merges at intersections; motorist overtaking; and bicyclist unexpected turns/swerves.

Another source of education material is advocacy groups, such as the League of American Bicyclists, which provides information on availability of new training programs, legislative trends, etc.¹⁵

- a. Incorporate basic education/safety language into brochures and maps.
- b. Incorporate bicycle-pedestrian education/safety messages into other literature produced by the park department.
- c. Stock and distribute copies of bicyclist safety material.

Enforcement Activities. The following enforcement recommendations are related to safety:

- a. Establish basic rules and regulations for trails under the city's jurisdiction.
- b. Obtain and distribute copies of appropriate bicycle-pedestrian safety information produced by one of the referenced sources.
- c. Stock supplies of bicycle-pedestrian safety material, maps, and rules of the road at kiosks or other stations within parks.
- d. Establish police, park ranger, or volunteer patrol presence on trails. Issue courtesy slips to trail users who are not aware of rules.

- e. Continue police presence on streets. Communicate rights and responsibilities to motorists, bicyclists and pedestrians. Issue courtesy slips to road bicyclists who are not aware of the rules of the road. Issue traffic citations to bicyclists as appropriate.

- f. Coordinate enforcement with education programs. Grade schools are an excellent starting point for these programs. Include elements on bicycle registration and lighting.

- g. Change the view of bicycle related law enforcement as a "non-essential" program.

- h. Consider establishment of a bicycle registration requirement.

- i. Establish a police bicycle patrol. Bike patrols enhance neighborhood police visibility and are also useful in the enforcement of non-bicycle related responsibilities.

7. Monitoring and Evaluation

The implementation of the Washington Bikeable Walkable Community Plan should be monitored by representatives of the City, working closely with the Bicycle Pedestrian Task Force and with other elements of the community.

The utilization of local and external implementation resources managed by a realistic development timetable should be central elements in this monitoring process. Monitoring of facility usage should also occur, preferably on an annual basis. Regular progress reports to the City Council should be made including recommendations as to whether program resources, scoping, or timetables should be modified.