Franklin County Bikeable Walkable Plan

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trailnet
BIKE WALK LIVE

In partnership with:

james pona & associates, LLC
Community, urban & regional planning services

SOUTHWESTERN ILLINOIS RESOURCE CONSERVATION & DEVELOPMENT

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Chapter One: Existing Conditions and Analysis

The purpose of this study is to examine the potential for bicycling and walking to function as transportation modes useful in the everyday lives of Franklin County residents. Although the study focuses primarily on areas around cities of the county where there are concentrations of residential development in proximity to job and other activity centers, it will also examine the potential for longer intercity routes with either transportation or recreational value.

The first chapter of the report provides a description and analysis of existing conditions within Franklin County, Missouri, in preparation for the creation of a bicycle and pedestrian facilities plan in next chapter. It begins with a review and assessment of selected demographic and socio-economic data related 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 follow in the subsequent phase of work.

1A. Socio-Economic Factors

Franklin County is one of four principal counties, that, along with the Independent City of St. Louis, constitute the Missouri portion of the St. Louis Region. The Missouri components of the Region as listed by East-West Gateway include the Independent City of St. Louis, St. Louis County, St. Charles County, Franklin County, and Jefferson County. The Missouri counties of Lincoln, St. Francois, Warren, and Washington are often considered to be a part of the region due to population growth and migration over the past decade, as well as commute-to-work patterns. Franklin County is prominent among its neighbors for two reasons - its physical size and its location along a primary growth corridor. It is also the fourth-largest county in the state in terms of geographic size.

Illustration 1: Franklin County in context within the Missouri portion of the St. Louis Region (Source: www.missouriconomy.org).

The examination of population, age, income, and education factors in Franklin County will help to establish a setting to determine potential for the development of a bicycle and pedestrian system. Information for this analysis was obtained from U.S. Census data and from the Franklin County Master Plan. To gain broader perspective, portions of this data are compared to surrounding areas.

Population - A Growing County

The total population of Franklin County increased from 80,603 in 1990 to a total of 93,807 in 2000, which represents an increase of 13,204. This resulted in an increase of 16.4 percent, which is a greater rate than most counties in Missouri. This is due to continuing migration patterns and is similar to the growth in St. Charles and Jefferson counties.

In the table below, Franklin County's rate of growth from 1990 to 2000 is compared with six of the cities within the county. The part of the City of Pacific that lies within Franklin County had the highest percentage of increase at 27.3 percent. The largest numerical increases are in Washington at 2,537 persons, and Union at 1,848 persons. Collectively, the six cities had an increase of 6,650 persons. Thus, the unincorporated areas of Franklin County had an increase of 6,554 persons from 1990 to the year 2000 (see Table 1 below).

Table 1: Population Change, 1990 - 2000

County and Cities	Population		Increase	Percent Increase
	1990	2000	1990-2000	
Franklin County	80,603	93,807	13,204	16.4%
New Haven	1,737	1,867	130	7.5%
Pacific *	4,306	5,482	1,176	27.3%
St. Clair	3,932	4,390	458	11.6%
Sullivan *	4,526	5,025	499	11.0%
Union	5,909	7,757	1,848	31.3%
Washington	10,704	13,243	2,539	23.7%

*Population for Pacific and Sullivan is for the portions located in Franklin County.
Source: U.S. CENSUS

Franklin County's population increase can be viewed within a regional context. With St. Louis County almost completely built up by 1990, its growth rate from 1990 to 2006 was minimal, at

only 1 percent. Franklin County had an increase of 24 percent, which was comparable to Jefferson County at 26 percent. St. Charles County had the greatest growth at 59 percent. Its population went from 212,907 to 338,719, a numerical increase of 125,812. St. Charles County is almost built out – so it is possible that the future growth rate in Franklin County will pace the Missouri side of the St. Louis region (see Table 2).

Table 2: Population Growth in Franklin & Neighboring Counties

County	1990	2000	2006 Estimate	Percent Change, 1990 - 2006
Franklin	80,603	93,807	100,067	24%
Jefferson	171,380	198,099	216,469	26%
St. Charles	212,907	283,883	338,719	59%
St. Louis	993,529	1,016,315	1,000,510	1%

Source: U.S. CENSUS

Franklin County is currently undertaking an update to its comprehensive plan, and has completed an existing conditions analysis in preparation for the planning phase. The analysis reports the U.S. Census Bureau's 2009 population estimate as 101,263 - an increase of approximately 7.9% over the year 2000. This represents an annual growth rate of less than 1% during the period, and it is probable that this growth rate will be similar to that which will be reported for the following year when the Census Bureau releases the next decennial Census. Although overall growth rate for the decade will probably be the lowest of any decade since 1950, it is not dramatically different when looking at annualized growth between 1980 and 2000 when the growth rate averaged roughly 1.5% per year. The existing conditions analysis also notes that the Missouri State Office of Demography projects a further slowdown in Franklin County's growth rate - to less than .8% per year through 2020 and to less than .6% per year through 2030. This results in a 2030 population projection of 117,122.

Age Groups

A brief analysis of broad age groups for Franklin County and the six cities is shown in Tables 3.A and 3.B, based on the 1990 and 2000 U.S. Census. The Franklin County age group data represents the county's entire population including cities and unincorporated areas. In 1990, the

under 5 age group decreased from 7.5 percent to 6.9 percent in 2000, while the "5 to 24" age group increase also decreased. The "45 to 54" and "55 and over" age group both increased slightly. Sullivan had a higher ratio of the "55 and over" age group than all the other cities. The City of Pacific had the lowest number of people in the "55 and over" age group. Pacific and Union had the highest rates of growth between 1900 and 2000 and the lowest "55 and over" age group.

Table 3.A: Comparison of Age Groups - Percent of Total Population, 1990

	Age Groups				
County and Cities	**Under 5**	**5 to 24**	**25 to 44**	**45 to 54**	**55 and over**
Franklin County	7.5	30.5	30.8	10.6	20.6
New Haven	9.1	27.8	27.6	8.8	26.7
Pacific	8.4	31.6	31.7	10.8	17.7
St. Clair	8.5	32	29.3	7.6	22.6
Sullivan	6.9	27.6	27.5	9.3	28.7
Union	7.6	30.7	28.4	9.7	23.6
Washington	7.7	27.8	30.7	8.6	25.2

Source: U.S. CENSUS

Table 3.B: Comparison of Age Groups - Percent of Total Population, 2000

	Age Groups				
County and Cities	**Under 5**	**5 to 24**	**25 to 44**	**45 to 54**	**55 and over**
Franklin County					
New Haven	8	27.3	29	10.6	25.1
Pacific	7.3	28.76	31.9	11	21.1
St. Clair	7.6	31.1	30.5	11	20.6
Sullivan	7.3	27.8	27.5	11.3	26.1
Union	7.4	29.5	30.9	11.3	20.8
Washington	7.7	27.8	30.7	8.6	25.2

Source: U.S. CENSUS

With over 70 percent of the Franklin population between 5 and 55, there is clearly a large age cohort likely to benefit significantly from a pedestrian system and new bicycle facilities. The availability of bikeable-walkable trails is important in enriching the quality of life and is regarded as attractive by prospective residents. A system of trails would allow residents to experience the county's compelling landscape.

Household Income

The median household income in Franklin County in 1989 was $28,622, as reported by the U.S. Census. It increased to $43,474 by 1999, which represents a 52 percent gain. This represents a 5 percent annual gain in that ten-year period. Change in income is represented in the following table.

Table 4: Median Household Income, 1989 - 1999

County and Cities	1989	1999	Gain	Percent Gain
Franklin County	$28,622	$43,474	$14,852	52
New Haven	$21,622	$36,681	$15,059	70
Pacific	$23,606	$39,554	$15,948	68
St. Clair	$21,853	$35,716	$13,863	63
Sullivan	$21,019	$30,046	$9,027	43
Union	$25,033	$39,596	$10,923	52
Washington	$30,650	$43,417	$12,767	42

Source: U.S. CENSUS

The City of Washington had the highest income compared to the other cities at $30,650. in 1989 and $43,417 in 1999. New Haven and Pacific had the largest percent gain between 1989 and 1999, at 70 percent and 68 percent respectively. Incomes of less than $25,000 per household represent low incomes. All of the six cities are in the moderate household income level. Although it is believed that individuals will consider walking and bicycling for economic reasons, research shows that individuals in moderate and upper income categories will also consider such modes of travel if certain environmental and physical conditions are present.

Educational Attainment

There is a direct relationship between educational attainment and income. The City of Washington had the highest levels of income in Franklin County as well as a higher level of educational attainment as is demonstrated in Table 5 and Illustration 2 on the following page. Washington also has a significant number of quality firms in its industrial areas which in turn have people with higher educational attainment and incomes. The City of Sullivan and New Haven had the highest High School graduate percentages at 52.8 and 52.7 percent respectively, with Pacific close behind at 51.1 percent. Washington was the lowest at 41.7 percent.

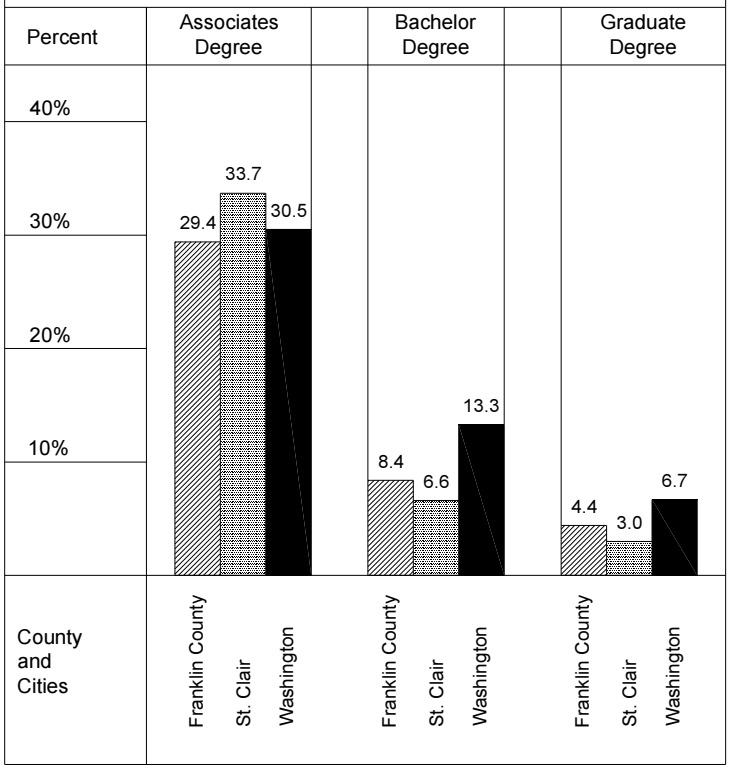
Table 5: Educational Attainment by Percentage, 2000

County and Cities	Less than 9th Grade	High School	Associate Degree	Bachelor Degree	Graduate Degree
Franklin County	9.3	48.6	29.4	8.4	4.4
New Haven	13	52.7	58.3	6.1	2.8
Pacific	10.3	51.1	27.5	8.5	2.6
St. Clair	15.7	46.4	28.8	4.8	4.3
Sullivan	12.4	52.8	24.9	6.6	3.2
Union	12.1	47.7	29.3	6.6	4.2
Washington	7.9	41.7	30.5	13.3	6.7

Source: U.S. CENSUS

The percent of the population with a college education is shown in Table 5. The Associate Degree includes people with "some college" education. The five cities – New Haven, Pacific, St. Clair, Sullivan and Union had 33.7 percent of the population with an Associates Degree. The City of Washington was less at 30.5 percent, and the county was 29.4 percent. The City of Washington had the highest percent of its population with a Bachelor Degree – at 13.3 percent compared to 6.6 percent for the six cities and 8.4 percent for the county. The ratio of persons with a Graduate Degree was also highest in Washington at 6.7 compared to 4.4 percent for the county and 3.0 percent for the five cities. As previously noted, the industrial base in Washington has attracted people with bachelor and graduate degrees.

Illustration 2: Educational Attainment.



Source: U.S. CENSUS

Journey to Work

The number of people that use a bicycle for their journey to work tends to increase, especially as new bikeways are established. However, the automobile is and will remain the dominant method of travel to work. The data on

journey to work for Franklin County and the six compared cities in the county is shown below in Table 6.

Table 6: Journey to Work, 2000

County and Cities	Drove Alone	Car Pooled	Public Trans	Motor-cycle	Bicycle	Walked	Worked at home - Other
Franklin County	37,029	5,845	153	19	0	525	1,792
New Haven	630	188	4	0	0	6	33
Pacific	2,082	244	10	0	0	31	48
St. Clair	1,499	261	0	7	0	26	40
Sullivan	2,098	385	18	0	0	35	76
Union	3,017	507	6	0	0	40	133
Washington	5,471	715	43	9	0	162	145

Source: U.S. CENSUS

With a total of 43,046 travelers, some 37,029 drove to work alone. This represents over eighty percent of all trips. All of the trips to work in Franklin County totaled 43,046. Auto trips, in the ”drove alone” category and “car pooled category” represented all but 697 trips. The highest “drove alone” volume was in Washington at 5,471. (This is in sharp contrast to an earlier period in the city’s history when the shoe factory was in operation and a majority of its employees walked to work. Although the complex included a four-story building, it had a relatively small parking lot.) Many of the auto trips by car; van or truck, were to St. Louis County. There was no reported usage of bicycles in the journey to work, and this is typical for areas where there are longer commutes. (However, in Washington, where a core bikeway system was developed after the 2000 Census, some bicycle commuting may currently exist. Such usage may be quantified in the next Census.) A total of 525 persons walked to work.

Most people consider a 20 to 30 minute travel time to work to be reasonable. Table 7 on the following page presents the U.S. Census data on travel times to work. There were 7,177 trips that were less than 10 minutes, representing 16.4 percent of all trip times. These are the trips that have a good potential for conversion to walking or bicycling. The “10 to 14 minutes” category had 6,074 trips to work or 13.7 percent of the total. Together, these two time categories represent 30.3 percent of all the trips to work that could be taken by non-motorized means. The positive impacts in terms of public health, gas consumption and air quality could be substantial. Some 6,148 people have a travel time to work of over one hour, representing 14 percent of the total travel time.

Table 7: Travel Time to Work, Franklin County, 2000

Time Length of Trip	Number of trips	Percent of trips
Less than 10 minutes	7,177	16.4
10 to 14 minutes	6,074	13.9
15 to 19 minutes	5,439	12.4
20 to 24 minutes	4,507	10.3
20 to 25 minutes	1,886	4.3
30 to 34 minutes	4,129	9.4
35 to 44 minutes	2,925	6.7
45 to 59 minutes	5,569	12.7
60 to 89 minutes	5,000	11.3
90 minutes or more	1,146	2.6

Source: U.S. CENSUS

The mode of travel to work is shown in Table 8 for the county. The "drove alone" category was 81.6 percent in the year 2000. Carpooling was substantially lower at only 12.9 percent. Many carpoolers still drive alone to park and car pool. As would be expected, very few people in Franklin County have access to public transit. There were no bicycles used for the journey to work, a reflection to some extent on the long distances required.

Table 8: Mode of Travel to Work, Franklin County, 2000

Mode of Travel	Number	Percent
Drove Alone	37,029	81.6
Carpooled	5,845	12.9
Public Transportation	153	0.3
Motorcycle	19	0
Bicycle	0	0
Walked	525	1.2
Other Means	283	0.6
Worked at Home	1,509	3.3
Total	**45,363**	**100**

Source: U.S. CENSUS

1B - Physical Features and Land Use

This section provides a review of physical features and land uses within Franklin County, Missouri. Included are land uses that either are currently in existence or are in the planning and development stage. Throughout this section, potential concepts relating to the use of physical features and land uses in an integrated bicycle-pedestrian transportation system are initially presented. These concepts will be further explored in the plan chapter.

The Transportation Network

Streets, Roads and Highways. The county is well-served with an extensive system of highways, arterials, collectors and residential streets, maintained by the Franklin County Highway Department, the Missouri Department of Transportation (MoDOT), Special Road Districts, and the constituent cities. This section provides an analysis of major roads in the system. Additional analysis will be conducted in Chapter 2 during the planning phase of work.

The principal highways serving Franklin County include Interstate 44 (I-44), U.S. Highway 50, and State Highways 30, 47, 100 and 185. I-44 and Highways 30, 50, and 100 are the primary east-west transportation routes and Highways 47 and 185 are the key north-south corridors.

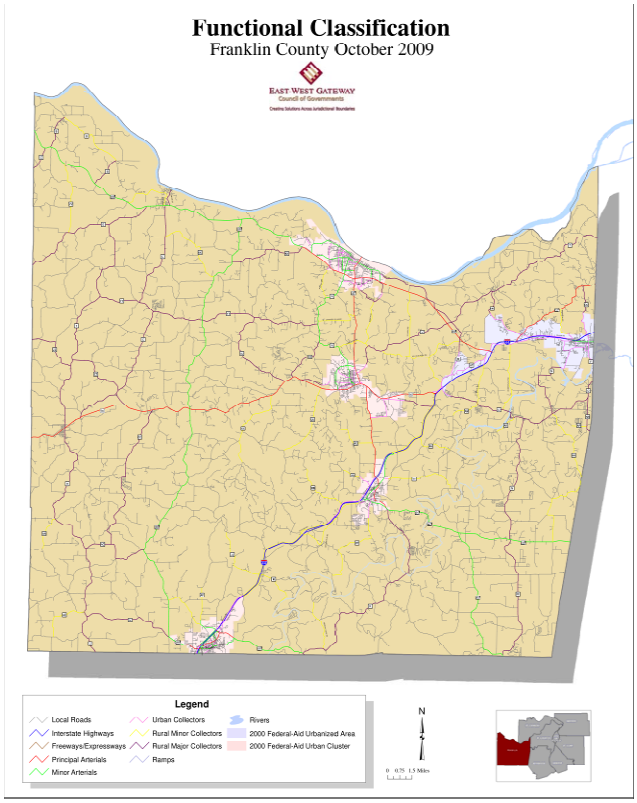


Illustration 3: Principal Highways-Roads in Franklin County (Source: East West Gateway Council of Governments).

On-Street Conditions for Bicyclists. Presently, residential streets and subdivisions in Franklin County are generally adequate as conveyances for a wide range of bicyclists due to lower traffic

levels and to relatively low truck and bus traffic. However, cul-de-sacs and limited through routes in newer subdivisions 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 and minimal access points to the roadway network, 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.

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 higher traffic volumes and speeds. These roads, especially during peak traffic flow periods, are often not considered to be bicycle-friendly by a broader grouping of cyclists who are recreational riders and who may ride less frequently.

Illustration 4 and 5 (above): Roadway designs in Franklin County vary, For nearly 5.3 miles from the eastern county line, Hwy O (left) and Hwy O/N are equipped with 8-foot shoulders that serve as bicycle and pedestrian facilities connecting Pacific and Robertsville. Hwy 100 (right) approaching Hwy MM is equipped with 4-ft shoulders, helping residents reach local destinations in Gray Summit (Images: Trailnet).

Illustrations 6 and 7 (below): Some state highways that run through the County like Hwy 47 have multiple design treatments to accommodate for different average daily traffic levels on different segments of the highway. Hwy 47 south of Hwy 30 (below, left) possesses just two 11- to 12-ft travel lanes, while Hwy 47 between St. Clair and Union (below, right) is equipped with two 12-ft travel lanes and 4- to 6-ft shoulders (Images: Trailnet).

In addition to higher traffic volumes, roadway design and width play an instrumental role in cyclists' road usage and perception of safety and comfort. The most important roadway design element impacting bicycle transportation on rural roads is the shoulder. Shoulders provide space for cars and trucks to pull over in case of breakdowns or emergencies. Shoulders also afford adequate space for non-motorized road users to travel, separating bicycle and pedestrian users from higher speed automobile traffic. The presence, width and condition of shoulders in Franklin County varies significantly. Most county and state roads in Franklin County lack shoulders altogether. For those that do possess shoulders, widths range from 10 feet in some heavily populated areas, such as Highway 47/50 in Union and Highway 100 in Washington, down to 2 feet on roadways with lower traffic volumes.

Using design criteria established by the Federal Highway Administration in the 1992 publication *Selecting Roadway Design Treatments to Accommodate Bicycles* (included in Appendix B), the planning team has identified existing major roads that are currently suitable for bicycle travel by a wide range of cyclists, including basic adult cyclists and more experienced child cyclists (Group B and C Cyclists). A number of variables were considered for this suitability analysis, including road width, shoulder width, speed limit, sight distance, and average daily automobile traffic.

Table 9 below identifies road segments in Franklin County that meet the criteria established by the Federal Highway Administration for basic adult and child cyclists on rural roads. The 63.5

Table 9: Road Segments Currently Suitable for Bicycle Travel.*

Road Segment	Length (ft)	Length (mi)	Limit To	Limit From
Hwy 100	3,930	0.7	Hwy OO	Eastern County Boundary
Hwy 100	82,160	15.6	Hwy KK	Old Gray Summit
Hwy 185	30,171	5.7	Southern County Boundary	Springfield
Hwy 185/Elmont	8,689	1.6	Dorson Cr	Springfield
Hwy 30/Gravois	32,621	6.2	Hwy 47	Eastern County Boundary
Hwy 47	34,790	6.6	Hwy 50	Hwy 100
Hwy 50	25,740	4.9	Hwy BB	Hwy AT
Hwy O	26,783	5.1	Hwy O	Eastern County Boundary
Hwy T	13,467	2.6	Hwy T	Hwy 100
Hwy W	10,010	1.9	Hwy JJ/W	Sand Ford Rd
Old Hwy 100	36,300	6.9	Washington City Limit	Hwy 100
Route 66/Commercial	5,544	1.1	Gravois	Hwy 57
Route 66/Hwy AT	25,147	4.8	Hwy 47	Hwy 100
Total	335,352	63.5		

* For each of these segments, there may be some minor gaps that mount to less than 10 percent of each segment that do not meet the criteria.

miles of road identified are located throughout the county and are segments of major county and state highways serving daily traffic volumes in excess of 5,000 AADT. In most cases, these highways provide the most direct routes between population centers and significant destinations throughout the county, and therefore serve cyclists very well for transportation-oriented trips. Although these road segments do not amount to a comprehensive, interconnected system, they do form the foundation on which the county's future network of bicycle facilities can grow and develop.

Illustrations 8, 9 and 10 (top to bottom): A pedestrian walks along the side of Highway K on the outskirts of St. Clair. Children walking home from school on a residential street without sidewalks in Washington. Student walking home from Pacific High School along West Osage Road. (Images: Trailnet)

<u>On-Road Conditions for Pedestrians</u>. The county-wide pedestrian network utilizes local, county, and state roads, as well as multi-use trails, to provide access to destinations throughout the county. Conditions for pedestrians along roads and highways throughout Franklin County vary considerably.

In urban areas throughout Franklin County, pedestrians utilize sidewalks, where they exist, residential streets with no existing sidewalks, and shoulders along busier arterials to reach schools, parks, commercial areas and other local destinations. It is along these facilities in urban areas that the great majority of pedestrian activity occurs in Franklin County, as destinations outside any given community are, in most cases, considered too far to walk.

While municipal policies guide the development of pedestrian facilities within city limits, Franklin County's subdivision ordinance dictates under what circumstances sidewalks will be constructed in unincorporated areas of the county. Franklin County's subdivision ordinance requires sidewalks only in subdivisions with lot sizes of less than one acre, and only when housing densities are three or more units per acre. Sidewalks are also required

within one half mile of a school and on publicly maintained roads within 1,000 feet of an existing sidewalk. Sidewalks must meet the design requirements of the Americans with Disabilities Act (ADA), have minimum widths of four feet, and separations from the street of no more than three feet. Responsibility for installation and maintenance is that of the developer, the adjacent property owner, or the homeowners association as defined in the subdivision restrictions.

In rural areas, where pedestrian activity is far less frequent, pedestrians utilize existing shoulders, or the far right edge of the travel lane if no shoulders exist. While walking in the travel lane increases potential conflict with automobiles, minimal pedestrian activity, low average daily automobile traffic, and long distances between destinations suggest that the benefit granted from improved pedestrian facilities will, in many cases, not meet the cost to provide such facilities. When these circumstances are present, pedestrian improvements should be coordinated with larger roadway projects, such as road widening or road resurfacing, in order to maximize the benefit provided by these projects.

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, a policy element would encourage the establishment of an interconnected system of pedestrian facilities to provide and encourage healthful, cost-efficient, and environmentally-friendly transportation options.

In such jurisdictions, 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 pedestrians walking two-abreast, parents pushing strollers, pets on leashes, and other examples. Some jurisdictions also require non-motorized pass-throughs between cul-de-sacs to connect neighborhoods and, ultimately, shopping centers, employment centers, institutions and other destinations.

<u>Targeting Bicycle and Pedestrian Improvements</u>. The road system should be viewed from a multi-modal standpoint. Significant portions of the system could eventually - with incremental improvements – accommodate more bicycle and pedestrian traffic. Because Franklin County

remains largely undeveloped, this is an opportune time to develop and include bicycle- and pedestrian-friendly features into roadway design standards. If enacted at this time 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.

An effective and well-used bicycle and pedestrian system is transportation oriented: It should facilitate movement between trip origins and destinations. But this 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 and pedestrian accommodation.

- Where wider collectors and arterials are not possible, consider adjacent sidepaths designed to shared-use path standards, within wider road right-of-way or on separate right-of-way such as inactive rail corridors and utility easements.

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. It is probable that such development will occur when the current recession ends. Similar growth can also be expected along major road transects - on Highways 100, 50, 47, and 185 - for some distance to the north and south of I-44. Improvements to accommodate/facilitate bicycle and pedestrian movement at these transects would provide an attractive mode choice for some short-distance trips, particularly where there are mixed-use developments that cater to newer, community-oriented lifestyles.

Regardless of how, where, and to what degree growth will occur, it will have significant implications for Franklin County's transportation system. It is also probable that future residents who fuel this growth will want their transportation system to provide options for

safely accessing urban destinations on foot or by bicycle. In other words, more people are expected to be amenable to - indeed want - non-motorized mode choices for some practical trips. In addition, increasing recreational demand for bicycle paths will also drive the development of hybrid systems that simultaneously address both transportation and recreational needs.

Rail Lines. Franklin County is served by three major rail lines: Union Pacific, Burlington Northern, and Missouri Central. Union Pacific has a 40-mile rail corridor extending from Pacific at the county's boundary with St. Louis County, westward to the Gasconade County line near Berger. It also passes through the towns of, Gray Summit, Labadie, Washington, and New Haven. Burlington Northern's rail corridor extends for 35 miles from Pacific on the east to Sullivan at the Crawford County line. Towns served include Pacific, St. Clair, Stanton and Sullivan.

The Missouri Central Railroad, formerly the Rock Island Railroad, enters the county from the northeast and extends westward to the Gasconade County line near Gerald. The 23-mile segment east of Union is currently active and is operated by Union Pacific. The western portion between Union and the Gasconade County line (shown in Illustration 11 below) is inactive. Efforts had been underway to reestablish an active rail line to provide rail service to this area, but apparently have not succeeded.

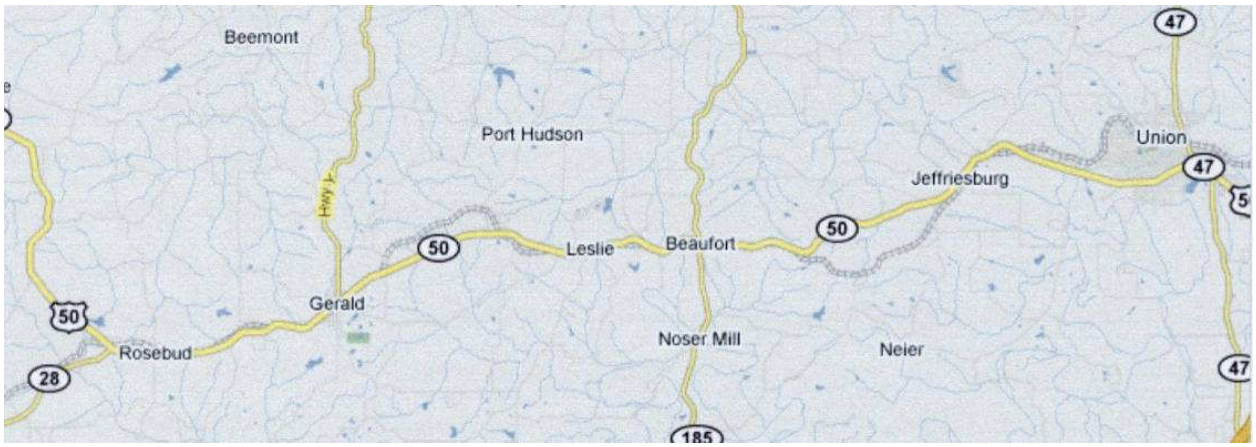


Illustration 11: The portion of the old Rock Island line extending westward from Union to Gerald has been inactive for many years and represents a potentially strong rail-to-trail opportunity. (Image: http://maps.google.com)

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

Illustrations 12 and 13: The inactive Rock Island rail corridor west of Union (left) shows strong potential as a rail-trail conversion. On the right, in Cobb County Georgia, the Silver Comet Trail was successfully developed on such a corridor. Similar conversions abound throughout the country. (Images: left, Trailnet; right, JPA)

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 nearby Katy Trail) for this purpose through rail-banking. This process enables de-activated rail corridors to be converted to recreational trail use. Although the heavily-used Burlington Northern and southern-most Union Pacific lines are highly unlikely to be de-activated within the foreseeable future, the inactive Rock Island line from Union to Gerald has strong potential as a rail-trail opportunity.

Principal Public Facilities and Institutions

Franklin County and its constituent cities provide a full spectrum of public facilities and institutions for citizens and visitors. Among the county's public facilities are the historic Court House and the Franklin County Government Center, which is home to the County Commission, Assessor, Auditor, Collector, IT Department, Public Works Division, County Clerk, Recorder of Deeds and the Treasurer. Other public buildings are also located in the City of Union, including the Franklin County Annex Building, the Franklin County Judicial Center, the Department of Health, and the Sheriff's Department. The county's public facilities infrastructure is complemented by similar public facilities within its seven principle cities and towns (Gerald, New Haven, Pacific, St. Clair, Sullivan, Union and Washington). Additional public facilities include three major and 41 minor water supply districts; ten municipal sewer districts; eight rural public sewer districts; and several public road districts complementing the county's road system.

Major public institutions include fourteen public school districts and several private schools with a mid-1990s combined enrollment of approximately 19,000 students. The county is also served by the East Central College, a major educational institution with an enrollment of approximately 4,400 students on campuses in Union, Washington and Sullivan. Other institutions include the Scenic Regional Library headquartered in Union with branches in New Haven, Owensville, Pacific and St. Clair. The county is also served by two major hospitals - St. John's Mercy and Missouri Baptist.

The location of public facilities and institutions is significant because it helps to identify areas of higher population density and activity centers where – with the development of the proper infrastructure – the prospects to encourage higher levels of bicycling and walking will be good. Most of these facilities and institutions are located within or close to Franklin County's Community Development (CD) land use districts.

Natural Features

Franklin County is situated in a rolling-to-very-hilly and scenic setting with prominent natural features including extensive forestation, the Missouri River, the Meramec River, the Bourbeuse River, many tributary streams, and farmlands. Although the county is experiencing urbanization, it is still dominated and defined by these features, which can provide an important foundation for the establishment of an interconnected bicycle and pedestrian system.

Illustration 14: The Meramec River. Franklin County's inventory of exceptional natural features can provide an important foundation for an interconnected bicycle and pedestrian system. (Image: Open Space Council of St. Louis.)

Existing Land Uses

Existing land uses in Franklin County are grouped into the following general categories: Agricultural, Residential, Industrial, Commercial, and Open Space/Water. Although its cities are predominantly residential, urbanization quickly transitions to suburban and then agricultural/open space uses. The urban and suburban areas defined by the county's "Community Development (CD)" land use category would benefit most directly from a bicycle-pedestrian system due to their heavier population densities and the presence of more activity centers. Franklin County's future land use map on the following page highlights planned growth areas. Coordinating transportation improvements and land use development in these planned growth areas will ensure that the needs of non-motorized transportation users are accommodated.

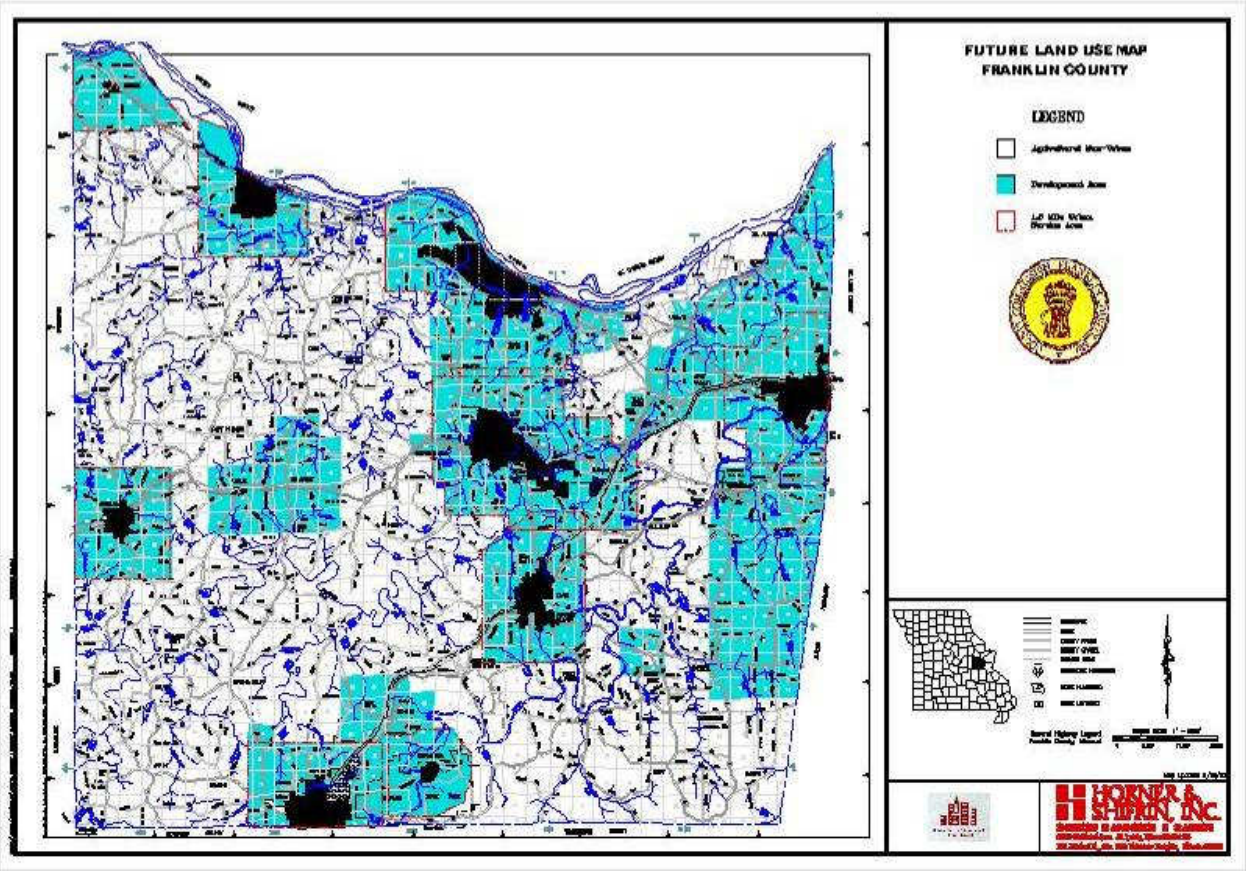


Illustration 15: Franklin County's Future Land Use Plan identifies areas (shaded) where urbanization is to be encouraged and, therefore, where the development of a bicycle and pedestrian facility infrastructure is likely to have the greatest beneficial impact. (Image: Franklin County 2010 Master Plan.)

1C. Current Land Use and Transportation Plans

An important element in the planning process to establish new bicycle and pedestrian facilities is the identification of plans related to this subject that may already be in some form of implementation. A number of local, county, and regional plans reference, both directly and indirectly, the development of bicycle and pedestrian facilities in Franklin County. The following plans are reviewed in this section:

- *Franklin County 2010 Master Plan* (2002)
- *Franklin County Long Range Transportation Plan* (2010)
- *St Louis Regional Bicycle Facilities Plan* (1994)
- *St Louis Regional Bicycling and Walking Transportation Plan* (2005)
- Local Bicycle and Pedestrian Plans

Franklin County 2010 Master Plan

Completed in 2002 and subsequently adopted by Commission Order, the Franklin County 2010 Master Plan provides a framework for growth and development in Franklin County. The plan is currently under revision. A number of bicycle and pedestrian related elements are included in the plan chapter:

- Encourage multimodal transportation usage on portions of the county road system. (Transportation Objective 3, p 39).

- Provide an enhanced infrastructure to support economic development. Relates to a number of sectors including tourism (Economic Development Objective 2, p. 42).

- Conservations easements for the preservation of open space. Although the plan does not yet recommend establishment of a parks system, it acknowledges this probability for the future and underscores the importance of identifying potential areas where future open space could be established (Parks/Open Space Element, pp. 51-52).

- The plan notes existence of an inactive portion of the Rock Island corridor west of Union and it suitability to provide a new – or restored – rail transportation opportunity to attract new industrial/commercial development. Efforts to implement this element have not been successful to date. Although the Plan does not recommend this corridor for rail-trail development, it remains well-suited for such an outcome if reestablished rail service proves not to be viable. (Freight element, pp 59-60.)

- Streambank stabilization and protection of riparian boundaries. The streambank stabilization element of *Franklin County 2010* presently does not directly tie-in with bicycle and pedestrian facilities development. However, this linkage does occur in many jurisdictions where banks are stabilized for additional reasons beyond stormwater management. In the Landscaping and Riparian Corridor Requirements section of O'Fallon, Illinois' Zoning Code, for example, the City identifies riparian corridors as critical environmental resources that form important visual and recreational opportunities for the community. The City's approved bicycle and facilities plan includes these corridors as key raw material in the development of its long term trail program.

- Encouragement of multimodal transportation elements. The Plan includes the encouragement of multimodal transportation usage on portions of the county road system as one of its key objectives under the goal of facilitating the safe movement of people and goods. Implementation actions a, c, e, f and g articulate specific bicycle and pedestrian improvements to implement this particular objective including the use of breakdown shoulders along highways to provide bicycle accommodations; promote the development of sidewalks in commercial and retail areas; facilitate pedestrian movement by eliminating barriers at cul-de-sacs; and consider bicycle and pedestrian usage in determining improvement plans for existing roadways.

Franklin County Long Range Transportation Plan

In July 2010, Franklin County adopted a long range transportation plan that establishes strategies for improving safety and efficiency on the county's roadway network through the

next 25 years. The plan's detailed analysis of demographic patterns and projects, crash statistics, roadway conditions and capacity, current traffic patterns, and future traffic demand lay the foundation for a series of goals and objectives that aim to create safer conditions for all road users and develop a strategic approach to the management, operation and development of the county's transportation system. A number of goals, objectives, and facility recommendations in the *Long Range Transportation Plan* focus on incorporating bicycle and pedestrian facilities into the county's overall transportation network. The four primary goals of the plan are listed below:

Goal 1: Maintain, enhance, and improve safety on all roads in Franklin County.

Objectives in achieving goal 1:

- Increase the safety and security of the transportation system for motorized and nonmotorized users.
- Transportation plans and projects shall provide due consideration for safety and contiguous routes for bicyclists and pedestrians.
- Develop and maintain a safe and efficient transportation system for all users.
- Minimize transportation costs by coordinating land use decisions with transportation needs.

Goal 2: Encourage and promote the safe and efficient management, operation, and development of transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and throughout Franklin County.

Objectives in achieving Goal 2:

- Preserve the county's existing transportation system through proper planning, funding, and maintenance.
- Partner with agencies and entities such as MoDOT, local road districts, and private developers to implement road projects.
- Improve connections to Interstate 44 and develop frontage roads where needed.
- Provide for improvements on county maintained roadways and bridges such as Bend Bridge.

- Work with MoDOT to find solutions for funding improvements to major Franklin County transportation roadways such as Route 47, Route 50, and Route 100.
- Provide connections between new developments to reduce short trips on the major road network.

Goal 3: Demonstrate how the adopted long-range transportation plan can be implemented to address cost of new capacity, operation, and maintenance projects.

Objectives in achieving Goal 3:

- Identify and recommend nontraditional partnerships, strategies, and public and private resources to assist Franklin County in funding planned transportation projects.
- Involve the public and stakeholders in the continual update and maintenance of the *Long Range Transportation Plan*.

Goal 4: Increase accessibility and mobility options for county residents, businesses, and highway users.

Objectives in achieving Goal 4:

- Encourage planning and construction of nonmotorized transportation improvements (trails, sidewalks) to benefit pedestrians, cyclists, and recreational users.
- Partner with cities and MoDOT to develop Park-N-Ride lots.
- Provide consideration for safety and contiguous routes for bicyclists and pedestrians.
- Promote the expansion/improvement of roads within the county to serve growth areas such as prior to or in conjunction with the growth occurring.

The *Long Range Transportation Plan* identifies and prioritizes projects based on the following criteria: safety, travel demand, connectivity, pavement condition, existing low-water crossing or flooding potential, and public and stakeholder input. The recommended roadway projects, ranked into three priority groups, are described in the table on the following page:

Table 10: Long Range Transportation Plan Recommended Projects

Scenario	Rank	Roadway Improvement	Project Limits	Type of Improvement
Priority One	1	Bend Road Bridge	Route N	New Bridge & Alignment
	2	Robertsville Road	Osage to Highway O	2 Lanes
	3	Hogan Road	Highway 100 to N. Outer Road	2 Lanes
	4	Thorton	I-44 to Highway 100	2-3 Lanes
	5	North Four Mile Road	Highway A to Highway 100	2 Lanes
	6	Country Club Road	Highway YY to Highway 47	2-3 Lanes
	7	St. Marys Road	Highway O to Highway 100	2 Lanes
	8	Acid Mine Road	I-44 to Route JJ	2-3 Lanes
	9	Bieker	Highway 47 to South Point	2 Lanes
	10	Old Gray Summit	Osage to Highway N	2 Lanes
	11	Clearview	Highway A to Highway V	2 Lanes
	12	St. Johns Road	St. Louis Rock Road to Highway 100	2-3 Lanes
	13	New Interchange	Anaconda	2 Lanes
Priority Two	1	Realign Highway YY at Highway A	Existing Hwy YY	2 Lanes
	2	New Roadway	Highway UU to Highway WW	2 Lanes
	3	I-44	at Highway AH - Schuchart	Enhanced Interchange
	4	Highway H	Gerald to Sullivan	2 Lanes
	5	New Roadway	Highway 185 to Highway JJ	2 Lanes
	6	Hilltop Road	St. Louis Rock Road to I-44	2 Lanes
Priority Three	1	Highway 47 Bridge	Over Missouri River	Bridge
	2	Improve Highway 47	City of Washington to City of St. Clair	2-4 Lanes
	3	US 50	Union to County Line	4 Lanes
	4	Highway 30	County Line to St. Clair	4 Lanes
	5	Improve Pttery Road	Highway A to Highway 100	2-3 Lanes
	6	Highway N	Highway 30 to Highway O	2 Lanes
	7	Improve Prairie Dell Road	Highway 50 to I-44	2-3 Lanes

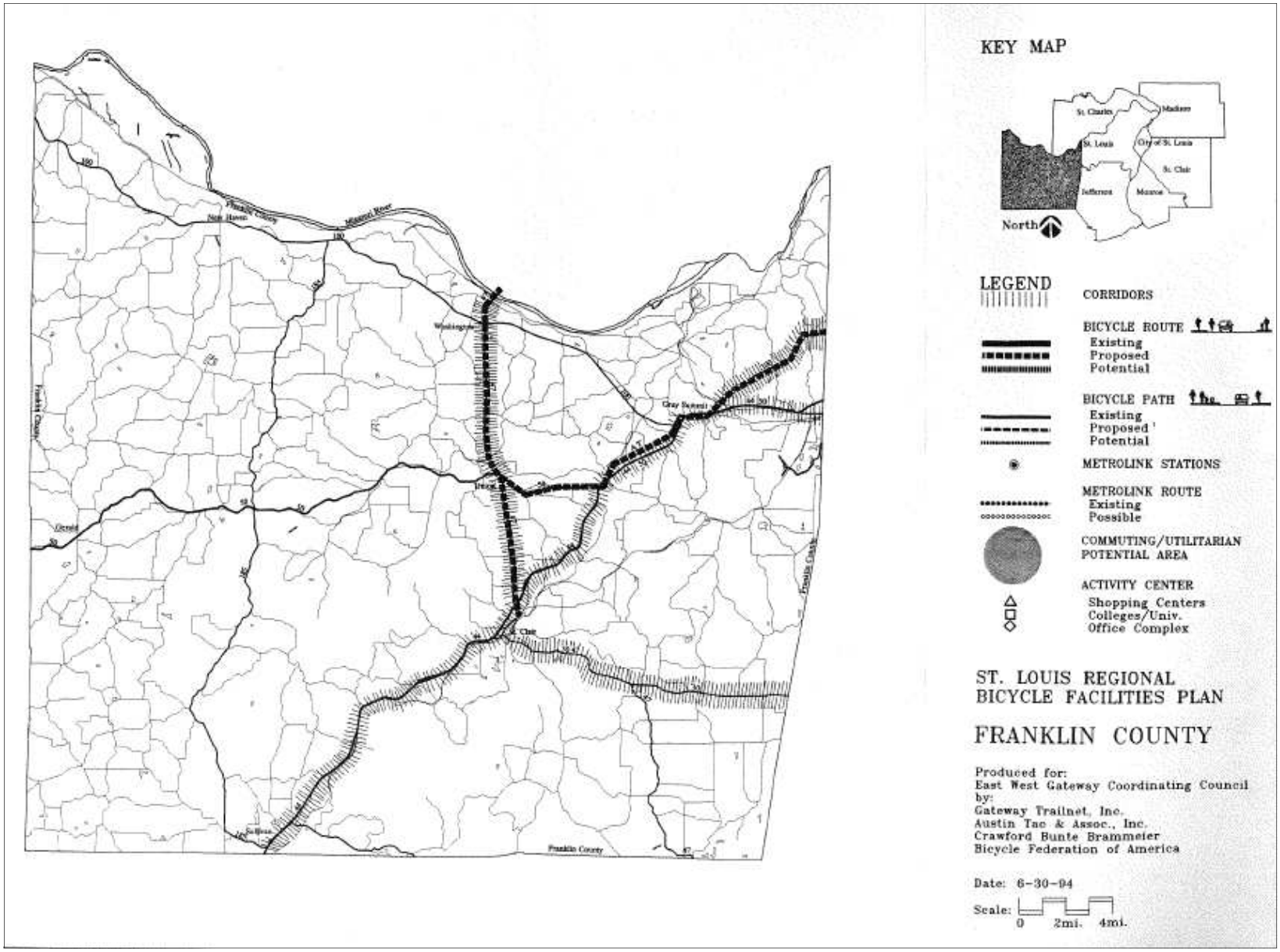
Source: Franklin County Long Range Transportation Plan, 2010

Coordinating bicycle and pedestrian improvements with planned roadway projects identified in the *Long Range Transportation Plan* can help reduce overall construction costs, improve application scores for Surface Transportation Program funding, and expand potential funding sources to include Transportation Enhancements Program, Safe Routes to School, Congestion Mitigation and Air Quality, and other bicycle- and pedestrian-related programs.

St Louis Regional Bicycle Facilities Plan

In 1994, East West Gateway Coordinating Council produced a bicycle facilities plan that provided general corridor-level recommendations for a basic system of trails throughout the

Illustration 16: St. Louis Regional Bicycle Facilities Plan - Franklin County Recommended Facilities



metropolitan region. The plan recommended development of bikeways along Highway 100, Highway 47 and Highway 50, and Route AT, as depicted in the map on the following page. These recommended bikeways correspond to anticipated growth corridors of the early 1990s and provide coverage only for communities in central and northeastern Franklin County.

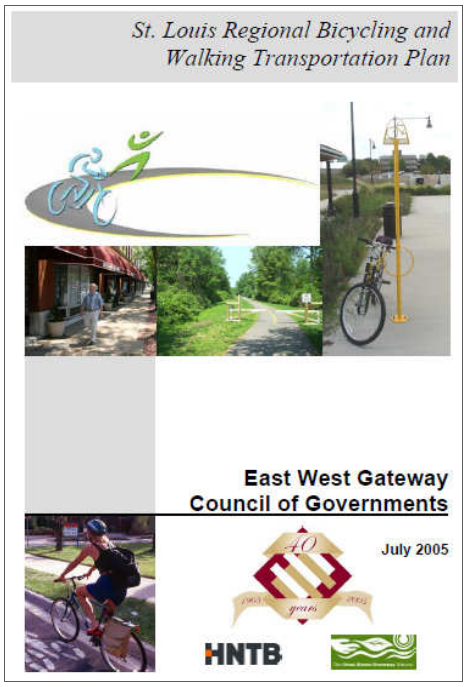


Illustration 17: The Regional Bicycling

St. Louis Regional Bicycling and Walking Transportation Plan

Building on *Legacy 2030*, the regional long-range surface transportation plan, the Regional Bicycling and Walking Transportation Plan supports the sustainable growth and development, improved environmental conditions, and enhanced quality of life for the St. Louis region. Unlike most bicycle and pedestrian master plans, which focus on the prioritization of recommended facilities, this plan focuses instead on the provision of resources for municipalities in the planning and design of bicycle and pedestrian facilities, ensuring a consistent, continuous, safe, and efficient multi-modal transportation system Contents of the plan include an analysis of residents' bicycling and walking activity, categorization of various bicycle and pedestrian environments and design elements, a summary of various suitability models for determining the compatibility of bicycle and pedestrian facilities in a variety of contexts, model ordinances for bicycle parking and support systems, and marketing and education strategies for the promotion of bicycling and walking. As a result of the *St Louis Regional Bicycling and Walking Transportation Plan,* nearly thirty communities have developed or are in the process of developing local plans to improve bicycling and/or walking conditions.

Local Bicycle and Pedestrian Master Plans

More recently, two Franklin County cities – New Haven and Washington – have completed local bicycle and pedestrian facility planning efforts. The City of New Haven completed and adopted the *New Haven Bikeable Walkable Community Plan* in June 2008. While the New Haven plan focuses on internal non-motorized circulation, opportunities are present to integrate New Haven's local bicycle and pedestrian facilities into a county-wide network through regional corridors like Highway 100.

The City of Washington is nearing completion on the *Washington Bikeable Walkable Community Plan* as well, building on the efforts of the City's *Bicycle Facilities Plan* (1999). This first plan resulted in nine miles of on-street bicycle routes and the development of the Rotary Riverfront Trail, a three-mile multi-use trail connecting downtown Washington to neighborhoods on the east end of town. The Rotary Riverfront Trail quickly became the City's most heavily used park facility, enjoyed year round by people of all ages and abilities.

In the City of Union, the planning process commenced in the Fall of 2010 to develop a bicycle and pedestrian master plan, becoming the third municipality in Franklin County to develop a long-range plan for bicycle and pedestrian improvements. This strong planning history signifies continued, dramatic, and growing interest in bicycle and pedestrian facilities throughout Franklin County. The present Bikeable-Walkable planning process can capitalize on this momentum and help to provide inter-city linkages for added transportation, recreational, and economic impact.

1D - Existing Bicycle and Pedestrian Facilities

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. Some or all of these terms will be used in this study, and are presented here as an introduction to the review of existing bicycle facilities in Franklin County and the region.

Accommodation. 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.

Illustration 18: Common "Share the Road" signage combination used throughout the state. (Sign images from the Manual of Traffic signs, copyright of Richard C. Moeur. All rights reserved.)

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.

Illustration 19: Standard Bike Route sign used by communities throughout Missouri (Source: MUTCD).

Illustration 20: This typical bicycle lane design affords safe bicycle travel as well as parking lanes on this wide street (Source: PBIC).

Illustration 21: Bicyclists and walkers share the Rotary Riverfront Trail on an unusually warm January Day. Shared use paths like the Rotary Riverfront Trail offer commuter and recreational users an off-street alternative, free from automobile traffic (Source: Trailnet).

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.)

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.)

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. Shared use paths, also called multi-use trails, are often used interchangeably with bicycle path, but more often meet ADA standards for pedestrian and disabled mobility.

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

Designated On-Street Bicycle Facilities in Franklin County

A number of communities in Franklin County have added bicycle routes, bicycle lanes, and warning accommodation (Share the Road) signage to local roadways to encourage bicycling as a means of transportation and to warn motorists of the potential presence of other road users.

Pacific. The City of Pacific currently has a network of bicycle routes that run through the City, including a short bicycle lane segment on East Osage from Neosho eastward for roughly 750 feet. These bicycle routes connect residential neighborhoods to local parks and the Pacific downtown area.

Illustration 22: Bicycle lane on E. Osage in Pacific (Source: Trailnet).

Union. The City of Union has installed warning accommodation signage and bicycle lane pavement markings on North Washington Street and North Church Street. While it does provide additional awareness to the presence of cyclists, the design of these bicycle lanes does not meet current AASHTO standards, as the bicycle lanes double as parking lanes.

Illustration 23: Bicycle lane on North Washington Street in Union (Source: Trailnet).

Washington. Washington currently has a 9-mile on-street network of bicycle routes that connect major community destinations north of Highway 100. A Bikeable Walkable Community Plan for the City of Washington is expected to be completed in 2010 and will update the existing network with additional connections to new development and planned trails.

Illustration 24: Bike Slot on Highway 47 at the intersection of Highway 100 in Washington (Source: Trailnet).

County-wide. MoDOT has added warning accommodation signage to a number of MoDOT maintained roads in Franklin County, including Highway T and Highway 100. In addition, MoDOT has begun to use an innovative treatment at signalized intersections called bike slots. These bike slots provide dedicated space

for cyclists approaching and waiting at an intersection and also reduce conflict with right-turning vehicles. Bike slots have been installed at a number of intersections along Highway 100 and Highway 47 in Washington. In addition to these designated facilities, MoDOT has also designed several segments of roads in a manner that accommodates both bicycle and pedestrian travel, identified in Table 9 on page 11.

Shared Use Paths in Franklin County

There are very few multi-use asphalt trails in Franklin County. While the majority of these facilities are small, wheelchair accessible trails in Missouri state parks and conservation areas, the most prominent and heavily used paved multi-use trail is Washington's Rotary Riverfront Trail, a three-mile long facility that connects to a larger nine-mile on-street bikeway system. The Rotary Riverfront Trail has been Washington's most heavily used park facility, and a second-generation bikeway planning effort is underway in the form of a Bikeable-Walkable Community Planning Study. This effort is expected to result in additional trails to complement the Rotary Riverfront Trail, as well as new on-street facilities to promote non-motorized movement. In 2010, Franklin County completed the Labadie Trail, a short trail along Highway T connecting Main Street, Labadie Elementary, and subdivisions to the west. The trail provides a safe connection for community residents to reach local destinations in Labadie.

Regional Facilities in and around Franklin County

The Katy Trail. At over 230 miles in length, the Katy Trail (pictured) extends through St. Charles and other counties primarily along the north bank of the Missouri River westward toward Kansas City. This long facility has become one of the Missouri Department of Natural Resources most heavily-used parks, and a major tourism asset for the State of Missouri. From 2004 to 2008, the Katy Trail averaged over 255,000 visitors. Many of these visitors stop in towns located on or near the trail for dining, shopping and lodging. An article in the St. Louis Post-Dispatch from September 6, 2009 highlighted the

Illustration 25: Katy Trail generates a substantial amount of recreational and ecological tourism, but Franklin County benefits only minimally, despite its close proximity to the trail, due to poor access across the Missouri River (Image: James Pona).

economic activity in the towns of Augusta and Defiance due to increased use of the Katy Trail.[1] Currently, direct access to the Katy Trail from Franklin County is limited to the Highway 47 bridge, a facility that offers little accommodation for bicyclists and no pedestrian access. BikeKatyTrail.com, an online resource for Katy Trail users, discourages bicyclists from using this bridge, instead suggesting to call local bed and breakfasts to arrange transportation across the Missouri River. Improving bicycle and pedestrian access to the Katy Trail from Washington can safely connect bicyclists to this state-wide recreational resource.

Ozark Trail. The Ozark Trail is system of over 300 miles of hiking/backpacking and multi-use trails that runs through the Missouri Ozarks from southern Missouri northwards to Onandoga State Park, roughly 12 miles south of Franklin County. The Ozark Trail is the result of more than 30 years of successful public/private partnerships and coordination under the Ozark Trail Council moniker. The complete vision for the trail stretches northward into the St. Louis Metropolitan Area and south to the state border, where the Ozark Trail will connect with the Ozark Highlands Trail in Arkansas to create over 800 miles of connected trail running through the Ozark Mountain Range.

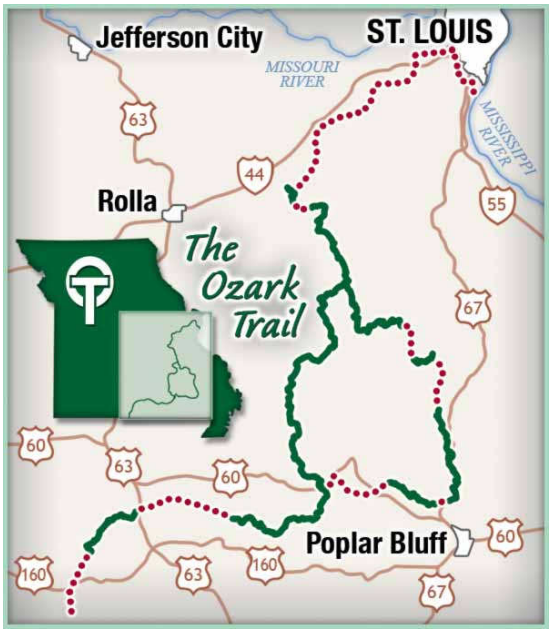


Illustration 26: Planned portions of the Ozark Trail, shown as dotted red lines, extend northward into Franklin County (Source: OzarkTrail.com).

To connect to the St. Louis Metropolitan area, the Ozark Trail would follow the Meramec River northeastward through Franklin County and eventually connect to the Meramec Greenway trail system. Numerous challenges exist in extending the Ozark Trail through Franklin County, the most significant of which are that lack of available public land and the acquisition of trail easements on private property. In addition, the Ozark Trail, which offers a more rugged, backcountry experience, will find expansion into Franklin County difficult to due to the county's increasing population and suburbanization. As the Ozark Trail moves into exurban and suburban areas of the St. Louis Metropolitan Region, the nature of the trail must adjust to meet the needs of local residents, who will demand a facility better equipped to handle a variety of trail users for both recreational and utilitarian uses.

1 Gallagher, J. (2009, September 6). Small towns along Katy Trail in St. Charles County prosper as bikers and hikers flock to

Meramec Greenway. Dating back to the 1960's, county and municipal governments have been working together to provide a coordinated approach to managing the 108-mile stretch of the lower Meramec River, from its confluence with the Mississippi River westward to Meramec State Park in southwest Franklin County. The Meramec Greenway has grown to contain over 28,000 acres of public and institutional land, including local and state parks, conservation areas and institutional areas like Shaw Nature Reserve, providing a variety of recreational and educational opportunities.

Plans for future enhancement of the Meramec Greenway include the completion of a 60-mile backbone trail along the Meramec from the Mississippi River westward to the Pacific Palisades Conservation Area at the border of St. Louis, Franklin, and Jefferson Counties. To this point, segments of the backbone trail totaling 15 miles have been completed, with additional segments currently in planning, engineering and construction phases. The creation of the Great Rivers Greenway District in 2000 has provided a steady funding stream and the staff capacity for trail development along the Meramec River, but Great Rivers Greenway District's geographic scope does not extend to Franklin County. The district works with local governments and public agencies in St. Louis City, St. Louis County and St. Charles County to implement its vision for a 600-mile web of interconnected trails and greenways in the St. Louis Metropolitan Area.

While the majority of trail development along the Meramec Greenway has occurred in St. Louis County, there is significant trail mileage near the Meramec River in the numerous state parks and conservation areas in Franklin County. Over 47 miles of loop trials abut the Meramec River in the county, all of which are contained in Meramec and Robertsville State Parks, Meramec Conservation Area, and Shaw Nature Reserve. The close proximity among destinations and population centers along the Meramec River provide opportunity for linear trail segments.

Route 66 State Park. A prominent public facility along the Meramec Greenway, Route 66 State Park was developed on the site of the former City of Times Beach in southwestern St. Louis County. A remediated Superfund site, this unusual facility has seven and a half mile trail network for hiking, bicycling and equestrian use. Portions of the network incorporate the City's old street system. There is also a trail connection to the City of Eureka south of I-44 by way of an underpass and plans for future connection to Castlewood State Park.

Other trails in adjoining and nearby Missouri counties include the Mississippi 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 were underwritten over the past fifteen years by the federal Transportation Efficiency Act for the 21st Century (TEA-21), and its predecessor program, 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, among which is their strong and growing popularity with local residents and tourists alike. Because of this popularity, there is a positive economic outcome. 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 percent) had increased the size of their investment since the Trail had opened."[2]

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.

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

[2] "The Economic Benefits of Trails;" American Hiking Society.

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.

Illustration 27: Ohio's Buckeye Trail System logo. (Image: Buckeye Trail Website)

The relationship between trails, recreational tourism and economic development has been demonstrated in many examples. The data suggest that a stronger economic future is possible for communities that develop longer trail systems where there are attractions and a coordinated marketing strategy. The Katy Trail – a converted rail corridor – is key area example of this trail-economics relationship. In Franklin County, the inactive 23 mile long Rock Island rail corridor extending between Union and Gerald could be developed into a long distance rail-trail. A similar rail-trail was developed in Cobb County, Georgia, and, like the Katy, is one of many examples from around the country.

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:

- A 1992 study of the Oil Creek Bike Trail by Pennsylvania State University revealed that average visitor spending was $25.85 per day.[4]

- As of 1992, approximately 170,000 individuals visited the Tallahassee-St.Marks Trail in Florida every year, with daily expenditures averaging $11.00.[5]

[3] Lindsey, G., Payton, S., Man, J., Ottensman, J. (2003). Public choices and property values: Evidence from greenways in Indianapolis. *Center for Urban Policy and the Environment, School of Public and Environmental Affairs, Indiana University-Purdue University Indianapolis*. 03-C19.1.

[4] NBPC Technical Brief (1995). "The economic and social benefits of off-road bicycle and pedestrian facilities."

- 135,000 people visit the Heritage Trail in Iowa, and spend an average of $9.21.[6]

- "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...."[7]

This section has shown that Franklin County would benefit substantially from an interconnected bicycle and pedestrian system having both trail and on-street components. The cities have and continue to experience substantial population growth with a variety of age cohorts who could be the primary beneficiaries of such a system. In addition to the institutional, commercial and retail infrastructure noted previously, other destinations would include homes within neighborhoods and in adjoining neighborhoods.

[5] Ibid.
[6] Ibid.
[7] Economic Impacts of Trails. National Trails Training Partnership website.

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Refer to Attached Existing Conditions Map

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1E - Existing Bicycle and Pedestrian Activity and Projected Facility Needs

Estimate of Existing Bicycle and Pedestrian Activity

Historical statistical data on existing bicycle usage in Franklin County is unavailable, nor have surveys been undertaken to measure levels of existing usage. Nevertheless, experiences 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. For example, Washington Missouri's Rotary Riverfront Trail, which connects to a nine-mile long on-street bikeway system, became the most heavily-used park facility in the City's entire park system within a year of its opening, according to the City's Parks Director. Similarly, the Missouri Department of Natural Resources has reported strong usage of the Katy Trail. A significant proportion of these trail users are bicyclists.

Notwithstanding this anecdotal information, an assessment of existing bicycle usage in Franklin County 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 percent of the households walked or jogged regularly; 47 percent regularly visited nature areas; 27 percent regularly engaged in bicycling and/or BMX activities; 20 percent hiked regularly; and 16 percent regularly ran.[8]

From MEPRD's multi-county household survey data and using the given percentages, estimates of probable regular participation by Franklin County households in activities likely to be undertaken on a trail/greenway can be made. These estimates are shown in the table on the following page, using the county's year 2000 population estimate and household counts of 93,807 and 34,945 respectively.

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

Table 11: Estimated Regular Participation by Franklin County 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 Facilities
Walking/Jogging	65%	60,975
Visiting Nature Areas	47%	44,089
Bicycling/BMX	27%	25,328
Hiking	20%	18,761
Running	16%	15,009
Total Participation Events	**n.a.**	**164,162**

*Based on county population of 93,807 and household size of 2.68 persons in 2000. Total participation exceeds the county population total because of participation by individuals in multiple activities.

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.

If it were assumed that residents of Franklin County participated most often in the same activities and that a county resident would participate in such events about six times per year, then this means that more than 21,000 Franklin County 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 - 130,392 - and dividing by 6 frequencies to arrive at the estimate.) The estimate is believed to be conservative.

Because of the present lack of substantial trail mileage in the county beyond the City of Washington, it is probable that many individuals are undertaking trail-related leisure activities

on existing trails and greenways outside of the county, such as the Katy Trail or other facilities. It is not unreasonable to assume that they represent an essentially untapped "market" of users who would make nearby trails their venue. 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 reconnaissance at area schools, there is some bicycle usage even without improved bicycle facilities. An estimate of this usage can be made based on the existing population of elementary and secondary school-age children in Franklin County, 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 2000 U.S. Census data.

The 2000 Census reported 7,513 children in the 10-14 year old age category who reside in Franklin County. For purposes of this study, it will be assumed that in 2000, 20 percent of the cohort – approximately 1,500 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. Because the census data is more than eight years old, Franklin County's 2006 population estimate of 100,067 persons can be used to update the estimate somewhat. In order to accomplish this, it will be assumed that the 10-14 year-old age cohort - which comprised 8 percent of the county's year 2000 population - is unchanged in 2006, and that there were 8,014 children in this age group in 2006. Therefore, is not unrealistic to estimate that 20 percent of these children, approximately 1,600 individuals, 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.

Older children are also a part of the bicycling picture in Franklin County. However, while 15 and 16 year olds may ride bicycles, it is probable that their riding activity begins to wane as

they approach the driving age. There were approximately 3,016 15-16 year-olds residing in the county 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 percent, or about 300 individuals, occasionally ride bicycles either to school or for other practical transportation purposes. Applying the same 2006 updating procedure, this cohort comprised 3.2 percent of Franklin County's year 2000 population. Therefore it is probable that there were about 3,217 children in this cohort in 2006, and that 10 percent, or about 320 of them rode bicycles for the above-stated purposes.

Among young persons in the 17-21 age range, it will be assumed that only 5 percent do – or would - ride bicycles because of the reasons discussed above. There were 6,228 residents in this age grouping in the 2000 U.S. Census. Therefore it is estimated that approximately 310 individuals bicycled to school or other practical destinations at least occasionally at that time. Applying the 2006 update methodology described above, they comprised 6.6 percent of the year 2000 population, or 6,644 individuals. Therefore, it is estimated that 5 percent, or about 330 individuals in this age grouping, ride bicycles to school or to other practical destinations at least some of the time.

Recorded Adult Bicycle Usage on the Road System. There are a variety of sources from which bicycle usage information is derived, including bicycle counts by local governments along roads and trails, US Census data reporting on commuting patterns, and local riding groups that document ridership at local events. There is little local data on adult bicycle usage in the area. No local governments have conducted bicycle and/or pedestrian traffic counts in Franklin County. The only locally-generated empirical data on bicycle counts comes from the Revolution Cycles Meet-Up Group, which documents attendance at their evening and weekend riding events. Joe Ferguson, owner of Revolution Cycles in Washington, provided attendance data on these group rides for 2009 (current through October 14, 2009). Total attendance for the 66 rides to date was 453, with an average of 7 cyclists per ride. The routes for these group rides cover a variety of terrain and distances,

Illustration 29: Members of the Revolution Cycles Meet-Up Group ride along Four Mile Road (Source: Joe Ferguson).

with shorter rides inside Washington city limits on weekday evenings and longer rides through Franklin County on weekend mornings.

The year 2000 U.S. Census reported no Franklin County residents riding a bicycle to work. This may not seem surprising given the often longer work commutes that are characteristic of counties in which a majority of residents commute to work outside of their county of origin: Longer commutes do not lend themselves well to bicycle commuting. In Franklin County, approximately 40 percent of the residential population (just over 17,000 of the county's 43,854 employed residents) worked outside of the county in the year 2000, so it is not surprising that the bicycle as a commuting vehicle is not in the picture.

Illustration 30: An experienced cyclist traveling east on the shoulder of Highway 100 approaching Interstate 44 on a wet and rainy Saturday in September (Source: Trailnet).

Yet the balance of Franklin County's 2000 work force - more than 26,000 residents - did commute to jobs within Franklin County. A reasonable explanation for the absence of bicycle usage among this group is that the road system generally may not have been perceived as being sufficiently safe to warrant considering the use of a bicycle., or that commuting distances were to great for bicycle travel.

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 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 Franklin County, 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 1.0 percent (national average).[9] "Travel" refers to any trip purpose including shopping, errands, recreation, and getting to work.

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

A separate source of data on commuting to work is also available. The U.S. Census transportation to work data indicates that in 2001, 0.7 percent of the American work force regularly rode a bicycle or a motorcycle to work.[10] 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 0.3 percent to 1.4 percent of the population rode bicycles to work in the year 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 the major cities of Franklin County.

Accordingly, and given the fact that a significant portion of Franklin County consists of rural and semi-rural land, the mode percentages reported above will be conservatively standardized to 0.1 percent in order to develop a rough estimate of total adult on-street bicycle usage for any trip purpose. Using the county's estimated year 2006 adult population of 100,067 persons, approximately 100 adults could be riding bikes regularly on roads within Franklin County. Most of this activity is likely to be occurring on roads either within the principal cities or on county roads close to the cities.

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 Table 12 on the following page.

In summary, these estimates were developed using Franklin County's total population rather than simply the portion of residents residing outside of its constituent cities. While the estimates may seem modest compared to the number of individuals who drive cars or use public transit, they nevertheless identify a probable bicycle facility user group as well as an imperative to provide for some level of improved bicycle facilities to meet their needs. Moreover, these estimates are based on year 2000 Census data and present figures, though unknown, are believed to be considerably higher. There is also a strong probability that new bikeway facilities will attract higher usage by a greater proportion of Franklin County's existing population and by users residing elsewhere who will be attracted to the county as a result of an appealing new bikeable-walkable infrastructure. Indeed, increased usage beyond original projections have been reported elsewhere after trails have been developed. In one study

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

Table 12: Summary of Existing Participation by Franklin County Residents in Activities Likely to Be Undertaken on Trails, Greenways, and On-Street Bikeways

Activity	Event	Number
People Engaging in Activites Likely to be Undertaken on Area Trails and Greenways (Walking/jogging, visiting natural areas, bicycling/bmx activites)	130,392*	21,000**
Elementary/Secondary School Children (10-14) Regularly Riding Bicycles on Streets/Sidewalks	n.a.	1,600
Older School Children (15-16) regularly Riding Bicycles on City Streets/Sidewalks	n.a.	320
Older adolescents and young residents (17-21)	n.a.	330
Adults Regularly Riding Bicycles on City Streets/Sidewalks	n.a.	100
Total Estimated Existing Participation	**n.a.**	**23,350**

* Probable number of times that Franklin County residents engage in activities likely to be undertaken on trails and greenways, based on MEPRD's multi-county survey.

** This estimate reflects the assumptions a) that Franklin County 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.

conducted by the Humphrey Institute of Public Affairs at the University of Minnesota for the Minnesota Department of Transportation, it was found that community bicycle usage, as well as pedestrian activity, increased when a practical bicycle and pedestrian transportation system was developed.[11]

[11] Barnes, G., Krizek, K (2005). Tools for predicting usage and benefits of urban bicycle network improvements. St. Paul, Minnesota: Minnesota Department of Transportation.

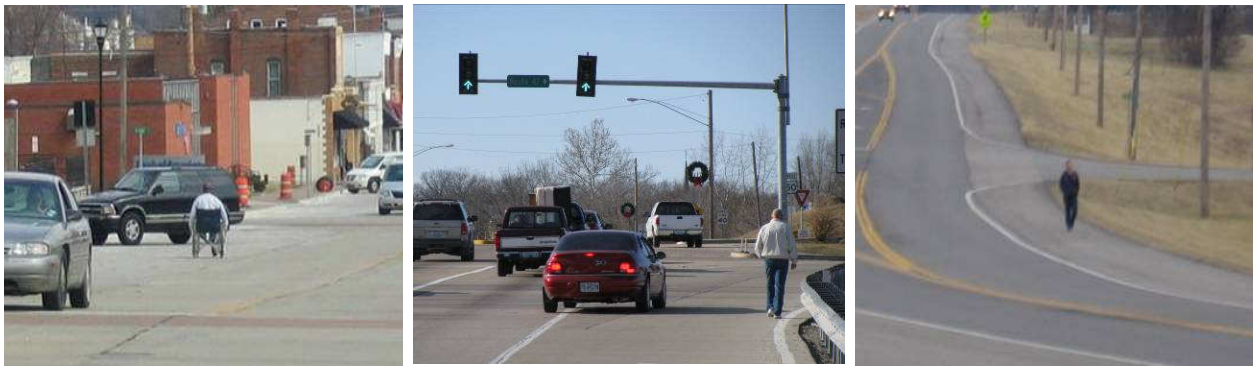
Pedestrian Activity On-Near the Public Right-of-Way

Thus far, this analysis has focused on trail-related bicycling and walking and on bicycling along public rights-of-way in Franklin County. The present section specifically examines existing pedestrian activity along the public right-of-way including streets, sidewalks, and active railroad corridors.

As indicated earlier in the study, most sidewalks are located within the municipalities of Franklin County, with some also located in unincorporated areas as regulated by the county's evolving subdivision code. Surveys to identify and record actual pedestrian usage in Franklin County have not been undertaken. Indeed, such studies are relatively rare in the United States. However, a subjective assessment of pedestrian activity can be taken through visual assessment within a particular study area and by reviewing national data on pedestrian travel activity.

In Franklin County, most of the pedestrian activity along public rights-of-way occurs on sidewalks. However, pedestrians are also frequently seen within the roadway and even occasionally walking along railroad corridors. The images below (Illustrations 31, 32, and 33) show typical examples of pedestrian activity in the urbanized areas of Franklin County. They highlight a central transportation goal – to take the straightest and shortest possible route between a trip origin and its destination.

Nationally, the U.S. Census Bureau reports that 2.5 percent of Americans walk to work. Other research indicates that pedestrians are willing to walk distances ranging from 500 feet to 2,640



Illustrations 31, 32, and 33: Field reconnaissance revealed a range of pedestrian conditions and facility needs in some urbanized areas of the county (Images: Trailnet).

feet (1/2 mile). Using this information as well as the information reported previously in this chapter, the following assumptions can be made:

- At least 40,000 Franklin County residents reside within or near its principal cities (the universe of possible pedestrians).

- 26,000 Franklin County residents presently commute to jobs within the county. It is conservatively assumed that 10 percent (2,600) reside within ½ mile of their place of employment.

- 2.5 percent of these residents – 65 individuals – presently walk to their jobs.

In the urbanized areas of the county, then, it is possible that 65 motor vehicle commutes per day are presently being replaced with more efficient and healthful pedestrian transportation. With improved pedestrian linkages between residential areas and nearby job centers, walking to work as a transportation mode could be significantly increased. In addition to the health and environmental benefits of this type of activity, studies have shown that pedestrian-friendly environments are more attractive to home buyers and therefore also attract more interest from developers and builders.

Projected Bicycle and Pedestrian Facility 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 subsequent plan chapter of this study.)

In terms of projected trail needs for Franklin County, 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 the present NRPA standard of 0.5 miles of each type of multipurpose trail per 1000 population (1.0 miles total), and using the county's year 2006 population of 100,067, there was a need for 100 miles of multipurpose trails at that time. Using the county's recent decennial growth rate of 16.4 percent, its projected 2030 population and trail needs could exceed 147,000 persons and 147 miles respectively.

Presently, there are approximately three miles of linear trails in Franklin County. Therefore, and using the above population projection, an additional 144 miles of multipurpose trails will be needed in order to serve the county's needs through the year 2030.

Specialized Nature Trails and Mountain Bike Trails. In terms of nature trails (the third type of trail defined in the NRPA standards), approximately 5 miles presently exist in Franklin County. 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 usage. Using the NRPA standard (.5 miles of nature trail per 1,000 population), therefore, results in a projected combined need for 74 miles of nature trails (rounded).

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 facilities 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 Franklin County 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 15 miles MTB trails in the county 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).

In order to establish an interconnected and more functional on-street bikeway system with access to most/all destinations, some state and county roads should receive specific bikeway treatments. This approach is not necessarily cost-prohibitive and will be addressed in the plan chapter. MoDOT's improvements to some state highways throughout Franklin County, as highlighted earlier on page11, provide the space necessary for bicyclists (and pedestrians) to safely operate in the presence of moderate and high volumes of automobile, bus and truck traffic. Designating specific roadways as bicycle facilities and continuing to redesign key highways, arterials and collectors with all potential road users in mind will be critical in creating a functional transportation network for cyclists. On highways and roads with low volumes of automobile traffic, bicycle facility improvements may not be cost-effective, especially where little existing and potential bicycle trips are likely to occur. In cases where existing bicycle traffic warrants improvements along roadways with low automobile traffic volume, warning signage can be used to alert drivers of the potential for cycling road users.

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.

Illustration 34: On-street bikeway improvements such as warning signage and other treatments would improve safety conditions for cyclists. (Image: Trailnet)

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 use of 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 county's existing roads. In many locations it could involve improvements as basic as the placement of signage. In other places it would require more intensive investment to establish bicycle 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.

Illustration 35: Pedestrians are frequently seen using the roadways or adjacent landscaped areas when sidewalks are not present (Image: Trailnet).

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. Through its recently approved subdivision ordinance, Franklin County is taking an important first regulatory step in providing for the county's future sidewalk needs. This regulation will help to establish a basic sidewalk system as new development occurs. In addition, improvements to state highways in the form of pedestrian-friendly shoulders, especially through more heavily populated municipalities and anticipated growth areas in unincorporated Franklin County, will provide necessary connections as Franklin County continues to develop. The system should then be further improved through the provision of direct connections to any multipurpose trails to be subsequently developed.

Conclusion

This study has analyzed existing conditions within Franklin County as they relate to bicycling and walking. It found that there are needs for more facilities to serve both modes, particularly along major collectors and arterials. There is also a need for improved pedestrian crossings at high-traffic locations.

The analysis also shows the need for a substantial and coordinated bikeway improvement program to meet evolving and increasingly-sophisticated recreational and transportation needs. The study team believes that Franklin County's needs will increase as it continues to grow. It is also probable that residents in portions of the county that are urbanizing will increasingly seek non-motorized transportation options for short-distance trips - a trend which is already 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.

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Chapter 2. Bikeable-Walkable Community Plan

In this chapter, a plan is presented for the establishment of a system of bicycle and pedestrian facilities in Franklin County. The plan is based on the information and analysis conducted in the previous chapter. It also reflects comments and input received from citizens at a public forum held on August 13, 2009. Additional field reconnaissance was undertaken during the plan phase to examine and identify road and street segments in the system.

The purpose of this plan is to enhance the transportation, recreation, health and fitness infrastructure in Franklin County. It contains goals and objectives, specific bicycle and pedestrian facility components, and a detailed implementation strategy.

2A - Goals and Objectives

1. Develop Bike/Pedestrianways as a Functional Element in the county's Transportation and Recreation System.

> a. Selectively modify existing roads and streets when financially feasible, to include bicycle and pedestrian accommodations that are appropriate to traffic conditions; and add multiuse paths between cul-de-sacs and other barriers as appropriate. Bikeway improvements should include not only the designation of roadways as bicycle facilities, but also the incorporation of related infrastructure elements such as horizontal storm water drainage grates, widened outside lanes, expanded shoulder widths, and, when appropriate, electric signals that incorporate bicycle detection systems. Similarly, pedestrian improvements should incorporate, when appropriate, sidewalks, adequate shoulder widths, ADA accessible curb ramps and other ADA accessible design requirements, striped crosswalks, and pedestrian signals.
>
> 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.

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 bicycle improvements with state and local jurisdictions to ensure that there is sufficient bikeway continuity.

g. Coordinate development activity to maximize the partnering benefits available through the Transportation Enhancements Program and other funding sources.

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 Sheriff's Department, local schools, businesses and the county 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 Sheriff's 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.

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

h. Regularly evaluate results of all bikeway development and program activity.

2B - Bicycle/Pedestrian Facility Components

The physical elements of the Franklin County Bikeable-Walkable Community Plan are identified in this section. The principal components – trails and on-street facilities - are shown on the map that has been included on the last page of this section.

Greenways & Trails

Several greenway and trail opportunities should be developed. Over 80 miles of potential trails and greenways have been identified along both rail corridors and river and stream corridors. Major opportunities are along the Ameren/UE rail corridor from its power plant in Labadie to the county line west of Gerald. While the portion of the rail corridor from Labadie to Union is active, the right-of-way appears to be sufficient to potentially accommodate a rail-with-trail. The segment between Union and the western county line is inactive and has strong potential as a rail-trail conversion.

Illustration 36: A wide variety of users enjoy the Rotary Riverfront Trail in Washington. Similar trail facilities can help to create a complete bicycle and pedestrian network for recreation and transportation purposes (Source: Trailnet).

The development of a long trail along this corridor, while ambitious, would result in a significant new tourism asset that would establish Franklin County

as a major trail destination as well as produce some economic impacts. In addition to the longer, cross-county rail-trails, shorter facilities, between 4 and 6 miles in length, are also recommended, including the Pacific-Brush Creek Greenway, which already has significant support from city staff and local residents, and the Union-Bourbeuse River Greenway, a 5.9 mile greenway beginning at the Missouri Department of Conservation's Union Access and extending south and west along the Bourbeuse River to North Bend Road. The specific trail and greenways are identified in Table 13 below.

Table 13: Recommended Trails and Greenways.

Type	Name/Label	Length (mi)	Limit To	Limit From	Cost (new)
Greenway	Union Bourbeuse Greenway	5.8	N. Bend Road	Hwy 50	$1,539,640.39
Greenway	Pacific Brush Creek Greenway	4.4	Old Gray Summit	County Boundary	$1,157,071.26
Rail With Trail	Wine Trail	22.7	Washington Riverfront	County Boundary/Herman	$5,993,763.54
Rail With Trail	MO Central	48.1	Western county boundary	Eastern county boundary	$12,687,168.35
Total Multi-Purpose Trails (4):		**81.0**			**$21,377,643.54**

On-Street Bikeways

Purpose. Franklin County's on-street bikeway system will consist primarily of treatments intended to make conditions safer for bicycle travel and to facilitate connectivity to destinations within the county. As a transportation facility, the on-street system recommended herein is more intensive within and adjacent to incorporated areas where there will be stronger usage. These urbanized areas have concentrations of activity generators and destinations. including local and state parks conservation areas, public facilities, retail, and commercial areas that are within close proximity to significant residential populations. An on-street system of bikeways also offers alternative transportation facilities providing connections to the planned trail system, helping the need for some motor vehicle trips to trails.

Intended Users. 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.

Facility Design. For each street segment selected as a designated bikeway, a recommendation is made regarding whether to use a formal bikeway treatment or an accommodation treatment using the typology identified below:

Illustration 37: On-Street Treatment Typology.

Treatment Type	Applicability	Design Treatment
Accommodation on Shared Roadway.  	For roadways 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 use warning signage only and are intended for use by experienced bicyclists who are comfortable traveling on roadways.	Urban Section (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. Rural Section: (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. Warning Signage: "Share the Road with Bicycles" signs every 1/4-mile.

Illustration 37: On-Street Treatment Typology, Continued.

Treatment Type	Applicability	Design Treatment
Bicycle Lane (Class II Bikeway)  	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.) "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.	Urban Section (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. 4-lane Rural Section: 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. 2-lane Urban Section: 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.) 4-lane Urban Section. 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.)
Bicycle Route - Signed Shared Roadway (Class III Bikeway)  	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.	Urban Section 14' outside lanes, "Bicycle Route" and "Share the Road with Bicycles" signage. Rural Section Recommended minimum 4' shoulder width. Increased shoulder width desirable if motor vehicle speeds exceed 50 mph. "Bicycle Route" and "Share the Road" signage.

This information can be used as a guide during the design-engineering process to develop the system. It is 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 A). The typology is also based on *Selecting Roadway Design Treatments to Accommodate Bicycles*, a report published by the Federal Highway Administration (FHA) in 1993, and other information provided by the Pedestrian and Bicycle Information Center (PBIC). Selected speed-volume matrices and charts from the FHA's report which form the basis of the typology have been included in Appendix B. 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) in 1999. These facility types are supported by bikeway markings and signage standards defined in the Manual on Uniform Traffic Control Devices (MUTCD), published in 2010. This material comprises a substantial and growing body of information establishing acceptable on-street bikeway design practices. It should be 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.

Recommended On-Street Facilities. The full listing of Franklin County road segments and recommended treatments keyed to this typology is provided in Table 14 on the following pages and displayed in Illustration 38: Plan Map on page 63. In addition to county-maintained roadways, this listing also includes state, city, and special road district-maintained roads, and it is recommended that the county encourage the development of bicycle accommodations on these facilities as well. In some cases, recommendations have been separated into multiple segments to reflect differences in existing roadway conditions and design.

Provided with each recommended facility is a preliminary opinion of probable cost. This is essentially a rough order-of-magnitude (ROM), based on actual development costs of other bikeway projects in the St. Louis region, national figures provided by the Rails to Trails Conservancy, and similar projects from around the country. 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.

Table 14.a: Recommended Bike Routes.

Street	Length (mi)	Limit To	Limit From	Cost (Signage)	Cost (Construction)	Total Cost
Hwy 100	41.7	W. County Boundary	E. County Boundary	$145,239.02	$3,679,066.64	$3,824,305.67
Segment 1	19.5	W. County Boundary	Hwy KK	$67,940.14	$2,826,940.15	$2,894,880.29
Segment 2	15.6	Hwy KK	W Osage Rd	$54,225.75	$0.00	$54,225.75
Segment 3	5.9	W Osage Rd	Hwy OO/Old Manchester	$20,479.24	$852,126.50	$872,605.74
Segment 4	0.7	Hwy OO/Old Manchester	E. County Boundary	$2,593.89	$0.00	$2,593.89
Hwy 185	7.4	S. County Boundary	Elmont	$25,647.58	$828,549.22	$854,196.80
Segment 1	5.7	S. County Boundary	Springfield	$19,912.61	$828,549.22	$848,461.83
Segment 2	1.6	Springfield	Elmont	$5,734.97	$0.00	$5,734.97
Hwy 30	13.1	Commercial	E. County Boundary	$45,788.33	$1,277,046.40	$1,322,834.73
Segment 1	6.2	Commercial	Hwy 47	$21,618.30	$899,521.68	$921,139.98
Segment 2	2.6	Hwy 47	Oak Grove Church	$9,073.09	$377,524.72	$386,597.81
Segment 3	4.3	Oak Grove Church	E. County Boundary	$15,096.95	$0.00	$15,096.95
Hwy 47	14.3	Commercial	N. County Boundary	$49,715.69	$1,853,573.88	$1,903,289.57
Segment 1	6.2	Commercial	Hwy 50	$21,585.41	$898,153.37	$919,738.78
Segment 2	6.6	Hwy 50	Hwy 100	$22,961.72	$955,420.52	$978,382.24
Segment 3	1.5	Hwy 100	N. County Boundary	$5,168.55	$0.00	$5,168.55
Hwy 50 (Union West)	17.7	W. County Boundary	Hwy BB	$61,708.05	$2,567,627.24	$2,629,335.29
Hwy 50 (Union East)	4.9	Bourbeuse Rd	Hwy AT/Service Rd	$16,988.70	$0.00	$16,988.70
Hwy O	11.7	AT	E. County Boundary	$40,797.32	$962,024.04	$1,002,821.35
Segment 1	6.6	Hwy AT	Hwy O	$23,120.42	$962,024.04	$985,144.46
Segment 2	5.1	Hwy O	E. County Boundary	$17,676.89	$0.00	$17,676.89
Hwy T	3.8	Hwy 100 @ Hwy V	Hwy MM	$13,078.79	$0.00	$13,078.79
Segment 1	2.6	Hwy 100 @ Hwy V	Hwy T	$8,888.11	$0.00	$8,888.11
Segment 2	1.2	Hwy T	Hwy MM	$4,190.68	$0.00	$4,190.68
Old Gray Summit	3.8	Hwy 100	Hwy N	$13,254.31	$551,502.18	$564,756.49
Old Hwy 100 - South	1.5	Hwy 100	Hwy AT	$5,264.17	$0.00	$5,264.17
Old Hwy 100 - North	6.9	Washington City Limit/existing route	Hwy 100	$23,957.74	$0.00	$23,957.74
Route 66 -Commercial*	1.1	Gravois	Hwy 47	$3,659.11	$0.00	$3,659.11
Route 66 - Hwy AT**	4.8	Service Rd/ Hwy 50	Hwy 100	$16,615.06	$0.00	$16,615.06
Totals:	**132.49**			**$461,713.87**	**$11,719,389.60**	**$12,181,103.48**

*** Corresponds to Route 66 Segment 7 on Table 13.b.**

**** Corresponds to Route 66 Segment 11 on Table 13b.**

Table 14.b: Recommended Warning Accommodations.

Street	Length (mi)	Limit To	Limit From	Cost (Signage)	Cost (Construction)	Total Cost
Bassett	2.5	E. County Boundary	Hwy T	$5,771.13	$0.00	$5,771.13
Bernhardt	1.6	Hwy H	Hwy Y	$3,639.25	$0.00	$3,639.25
Country Club	1.9	Elmwood GC	Hwy A	$4,388.28	$0.00	$4,388.28
Elmont	0.5	Hwy H	Elmont	$1,209.66	$0.00	$1,209.66
Fiddle Creek	3.6	Hwy T	Hwy 100	$8,122.95	$0.00	$8,122.95
Hwy 185	20.4	Hwy KK	Hwy AC	$46,384.88	$0.00	$46,384.88
Hwy 47	9.3	Gravois/Hwy 30	S. County Boundary	$21,080.27	$0.00	$21,080.27
Hwy A	3.9	Country Club	Independence	$8,867.12	$0.00	$8,867.12
Hwy AC	1.9	Jake's Prairie	Hwy 185	$4,278.65	$0.00	$4,278.65
Hwy AF	3.2	Ridge Rd	Bud	$7,152.58	$0.00	$7,152.58
Hwy B (East)	6.7	Hwy 100	Market (north)	$15,142.22	$0.00	$15,142.22
Hwy B (West)	1.4	Hwy 100	Market (south)	$3,266.95	$0.00	$3,266.95
Hwy BB	3.1	Hwy A	Hwy 50	$6,999.79	$0.00	$6,999.79
Hwy C	14.4	Hwy 50	Hwy 100	$32,652.32	$0.00	$32,652.32
Hwy E	6.1	Stone Church	Hwy 100	$13,919.19	$0.00	$13,919.19
Hwy FF	8.4	Hwy 30	Hwy 47	$18,972.55	$0.00	$18,972.55
Hwy H	19.1	Elmont	Bernhardt	$43,255.95	$0.00	$43,255.95
Hwy HH	0.3	Jefferson	Hwy O	$660.72	$0.00	$660.72
Hwy K	14.3	Hwy 185	Gravois/Hwy 30	$32,566.90	$0.00	$32,566.90
Hwy KK	5.0	Hwy 185	Hwy 100	$11,329.33	$0.00	$11,329.33
Hwy MM	4.1	Hwy T	Hwy 100	$9,386.42	$0.00	$9,386.42
Hwy N	8.1	Hwy O	Hwy 30	$18,335.08	$0.00	$18,335.08
Hwy N	5.6	Pacific Brush Creek Greenway	Jefferson	$12,772.77	$0.00	$12,772.77
Hwy OO	3.3	Hwy 100	I-44	$7,551.42	$0.00	$7,551.42
Hwy T	8.3	E. County Boundary	RR Crossing	$18,944.65	$0.00	$18,944.65
Hwy V	7.7	Hwy 47	Hwy 100	$17,404.68	$0.00	$17,404.68
Hwy VV	4.5	Hwy 100	Hwy E	$10,213.69	$0.00	$10,213.69
Hwy W	1.9	Hwy JJ/W	Sand Ford Rd	$4,304.29	$0.00	$4,304.29
Hwy W	1.7	Sand Ford Rd	terminus	$3,785.95	$0.00	$3,785.95
Hwy Y	8.8	Hwy YY	Bernhardt	$20,016.16	$0.00	$20,016.16

Table Continued on Page 62

Table 14.b: Recommended Warning Accommodations, Continued.

Street	Length (mi)	Limit To	Limit From	Cost (Signage)	Cost (Construction)	Total Cost
Hwy YY (East)	10.8	Hwy C	Hwy A	$24,500.00	$0.00	$24,500.00
Hwy YY (West)	2.6	Hwy Y	Hwy C	$5,898.20	$0.00	$5,898.20
Jake's Prairie	1.9	Hwy H	Hwy AC	$4,265.90	$0.00	$4,265.90
Jefferson	0.3	Hwy N	Hwy HH	$751.89	$0.00	$751.89
Lollar Branch	3.0	Spring Creek	Route 66/Service Rd	$6,824.01	$0.00	$6,824.01
Market	0.6	Hwy B	Hwy B	$1,300.02	$0.00	$1,300.02
Ridge	4.6	Hwy AF	Spring Creek	$10,553.31	$0.00	$10,553.31
Robertsville	4.3	Hwy 100	Hwy O	$9,711.36	$0.00	$9,711.36
Route 66	29.3			$66,504.97	$0.00	$66,504.97
Segment 1 - Springfield	4.1	S. County Boundary	Service Rd	$9,268.08	$0.00	$9,268.08
Segment 2 - Service Rd	2.5	Springfield	Hwy JJ/ Hwy W	$5,609.91	$0.00	$5,609.91
Segment 3 - Hwy JJ/ Hwy W	0.1	Service Rd	Service Rd	$327.64	$0.00	$327.64
Segment 4 - Service Rd	8.8	Hwy JJ/Hwy W	Hwy 30	$19,908.89	$0.00	$19,908.89
Segment 5 - Hwy 30	0.3	Service Rd	Gravois Rd	$582.72	$0.00	$582.72
Segment 6 - Gravois Rd	0.2	Hwy 30	Commercial Ave	$494.75	$0.00	$494.75
Segment 7	Commercial Avenue Bike Route from Hwy 30 To Highway 47, as listed on Table 13.a					
Segment 8 - Commercial Ave	2.3	Hwy 47	Hwy AH	$5,204.42	$0.00	$5,204.42
Segment 9 - Hwy AH (I-44 Overpass)	0.1	Commercial Ave	Service Rd	$325.46	$0.00	$325.46
Segment 10 - Service Rd	5.1	Hwy AH (I-44 Overpass)	Hwy 50 / Hwy AT	$11,475.11	$0.00	$11,475.11
Segment 11	Hwy AT Bike Route from Hwy 50/North Service Road to Hwy 100, as listed on Table 13.a					
Segment 12	2.0 mile section of the Hwy 100 Bike Route from Hwy AT to W Osage Rd, as listed on Table 13.a					
Segment 13	5.9 mile section of the Hwy 100 Bike Route from W Osage Rd to Hwy OO, as listed on Table 13.a					
Segment 14 - Old Manchester	1.1	Hwy 100	E. County Boundary	$2,472.96	$0.00	$2,472.96
Segment 13.A - Osage Rd	4.8	Hwy 100	E. County Boundary	$10,835.03	$0.00	$10,835.03
Spring Creek	4.8	Highway 185	Lollar Branch	$10,860.64	$0.00	$10,860.64
Stone Church	5.3	Hwy E	Hwy Y	$12,024.63	$0.00	$12,024.63
Totals:	**249.1**			**$565,570.76**	**$0.00**	**$565,570.76**

Refer to Attached Plan Map

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2C - Implementation Strategy

The implementation of the plan, both its physical infrastructure components and its recommendations for encouragement, education and enforcement, requires careful consideration of the many factors that affect the development of a non-motorized transportation network, as well as coordination and partnership with local, regional, state and national entities. This section of the plan addresses these considerations, detailing potential funding sources, plan adoption and regulatory actions, encouragement, education and enforcement programs and activities, and plan monitoring and evaluation. All of the activities described herein will fall under the jurisdiction of the Franklin County Public Works Department.

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 and providing connections between residential areas and significant destinations throughout the county.. Bicycle facility projects have been prioritized according to weighted criteria identified during the planning process, which include connectivity to existing and planned facilities and proximity to residential areas, parks, tourist attractions, schools, connectivity. This ranking system should not be used as a chronological schedule for project implementation; if the opportunity arises to undertake a recommended project, in coordination with scheduled roadway improvements, for example, the county should capitalize on that opportunity regardless of project rank.

Proximity. An effective non-motorized transportation network must carry users to a variety of destinations throughout the county. Facilities in close proximity to schools, local and state parks and recreational areas, and other important destinations are essential to creating a functional bicycle transportation and recreation system. These facilities provide access to community destinations and encourage residents to incorporate bicycling and walking, rather than driving, into their daily routines.

Adjacent Residential Population. In order to function efficiently, bicycle and pedestrian infrastructure must also connect to residential populations throughout the county. Creating

direct connections between residential neighborhoods and the aforementioned destinations presents county residents an alternative mode of transportation for short trips of 5 miles or less. 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. Facilities that close an existing gap in the network, link to other routes, and provide the most direct route choice enhance the network's coverage and efficiency while also improving safety for cyclists and pedestrians. With few existing designated bicycle facilities in Franklin County, recommended bicycle facilities with greater direct connections to other recommended facilities can create a foundation for the development of a bicycle transportation network. As such, projects with greater connectivity are scored higher.

Coordination with the Franklin County Long Range Transportation Plan. A number of non-motorized transportation improvements recommended in this plan relate to roadways identified for improvements in the Franklin County Long Range Transportation Plan. When feasible, the county should coordinate these bicycle and pedestrian infrastructure improvements with larger transportation projects to maximize the benefits for all road users while achieving significant economies of scale. Projects that overlap with recommendations in the Long Range Transportation Plan are given a higher score.

Coordination with Franklin County 2010 Master Plan. The Franklin County 2010 Master Plan (2002) depicts areas of future growth and development, based on analysis from Franklin County staff and input from community residents and stakeholders. Recommended projects in the Bikeable Walkable Communities Plan that overlap with the future land use development areas shown in the 2010 Master Plan can ensure that future residential, commercial and industrial areas are well-served by bicycle and pedestrian facilities.

Based on the criteria listed above, all recommended projects listed in the previous section have been prioritized and grouped into three tiers. Tier One projects will have the most significant impact to improve safety and connectivity for current and future residents of Franklin County. All tier one projects are within the future land use development areas described in the Franklin County 2010 Master Plan, serve significant residential populations, and provide access to multiple destinations throughout the county. In addition to signage improvements, construction of shoulders to provide space for pedestrians and cyclists, as well as enhance safety for all roadway users and extend the life of the roadway itself, is recommended for six of the twelve

Tier One projects. Every Tier One project is connected to at least one other Tier One project, creating a complete network that connects all significant concentrations of population in the county.

Tier Two projects supplement the bicycle and pedestrian network by creating additional connections throughout the county. The majority of these recommended projects are within future land use development areas and connect residential communities to regional parks, conservation areas, and tourist destinations.

Tier Three projects complete the recommended network of bicycle and pedestrian facilities. These projects provide the least connectivity to residential populations, schools, parks and other significant destinations in Franklin County.

Table 15: Project Prioritization

Tier	Rank	Project Roadway	Project Limits	Improvement Type
Tier One	1	Route 66	Southern County Boundary to Eastern County Boundary	Warning Accommodation
	2	Hwy 30	Commercial Avenue to Eastern County Boundary	Bike Route
	3	Hwy 100	Western County Boundary to Eastern County Boundary	Bike Route
	4	Old Hwy 100 - North	Washington City Limits to Highway 100	Bike Route
	5	Hwy O	Highway AT to Eastern County Boundary	Bike Route
	6	Hwy 47	Commercial Avenue to Northern County Boundary	Bike Route
	7	Hwy W	Sand Ford Road to terminus	Warning Accommodation
	8	Hwy T	Highway 100 / Highway V to Highway MM	Bike Route
	9	Hwy 50 (Union West)	Western County Boundary to Highway BB	Bike Route
	10	Hwy N	Planned Pacific Brush Creek Greenway to Jefferson	Warning Accommodation
	11	Old Gray Summit	Highway 100 to Highway N	Bike Route
	12	Robertsville	Highway 100 to Highway O	Warning Accommodation
Tier Two	1	Hwy T	Highway MM to Eastern County Boundary	Warning Accommodation
	2	Hwy N	Highway O to Highway 30	Warning Accommodation
	3	Bassett	Highway T to Eastern County Boundary	Warning Accommodation
	4	Hwy 185	Southern County Boundary to Elmont Rd	Bike Route
	5	Hwy A	Country Club Road to Independence Road	Warning Accommodation
	6	Country Club	Highway A to Highway 47 (Planned Connection)	Warning Accommodation
	7	Hwy W	Interstate 44 to Sand Ford Rd	Warning Accommodation
	8	Route 66 - Commercial	Gravois Rd to Highway 47	Bike Route
	9	Hwy B (West)	Highway 100 to Market Street	Warning Accommodation
	10	Elmont	Highway H to Elmont Planned Bike Route	Warning Accommodation
	11	Bernhardt	Highway H to Highway Y	Warning Accommodation

Table Continued on Page 68

Table 14: Project Prioritization, Continued

Tier	Rank	Project Roadway	Project Limits	Improvement Type
Tier Two	12	Market	Highway B (west) to Highway B (east)	Warning Accommodation
	13	Hwy MM	Highway T to Highway 100	Warning Accommodation
	14	Route 66 - Hwy AT	Highway 50 / Service Road to Highway 100	Bike Route
	15	Jefferson	Highway N to Highway HH	Warning Accommodation
	16	Hwy KK	Highway 185 to Highway 100	Warning Accommodation
	17	Hwy B (East)	Highway 100 to Market Street	Warning Accommodation
	18	Hwy OO	Highway 100 to Interstate 44	Warning Accommodation
	19	Hwy 50 (Union East)	Bourbeuse Rd to Highway AT / Service Road	Bike Route
Tier Three	1	Hwy AF	Ridge Road to Bud Road	Warning Accommodation
	2	Old Hwy 100 - South	Highway 100 to Highway AT	Bike Route
	3	Hwy V	Highway 100 to Highway 47	Warning Accommodation
	4	Hwy HH	Jefferson to Highway O	Warning Accommodation
	5	Hwy BB	Highway A to Highway 50	Warning Accommodation
	6	Fiddle Creek	Highway T to Highway 100	Warning Accommodation
	7	Stone Church	Highway E to Highway Y	Warning Accommodation
	8	Spring Creek	Highway 185 to Lollar Branch	Warning Accommodation
	9	Hwy YY	Highway Y to Highway C	Warning Accommodation
	10	Hwy 47	Southern County Boundary to Gravois Road / Highway 30	Warning Accommodation
	11	Hwy FF	Highway 30 to Highway 47	Warning Accommodation
	12	Hwy YY	Highway C to Highway A	Warning Accommodation
	13	Hwy AC	Jake's Prarie to Highway 185	Warning Accommodation
	14	Hwy C	Highway 50 to Highway 100	Warning Accommodation
	15	Hwy E	Stone Church Rd to Highway 100	Warning Accommodation
	16	Hwy Y	Highway YY to Bernhardt Road	Warning Accommodation
	17	Jake's Prairie	Highway H to Highway AC	Warning Accommodation
	18	Hwy 185	Highway KK to Highway AC	Warning Accommodation
	19	Hwy K	Highway 185 to Gravois Road / Highway 30	Warning Accommodation
	20	Hwy H	Elmont Road to Bernhardt Road	Warning Accommodation
	21	Lollar Branch	Spring Creek Road to North Service Road	Warning Accommodation
	22	Ridge	Highway AF to Spring Creek Road	Warning Accommodation
	23	Hwy VV	Highway 100 to Highway E	Warning Accommodation

To see the complete scoring for each project by the criteria listed at the beginning of this section, see Appendix Section D - Recommended Project Prioritization.

Funding Sources

The estimated costs to construct Franklin County'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.

Surface Transportation Program (STP). **T**he Surface Transportation Program provides flexible funding that may be used by States and localities for projects on any Federal-aid highway, including the NHS, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities. The STP is administered by MoDOT through the East West Gateway Council of Governments on an annual basis.

More information: http://www.ewgateway.org/
http://www.fhwa.dot.gov/safetealu/factsheets/stp.htm

Highway Safety Improvement Program (HSIP). Developed to reduce traffic fatalities and serious injuries on all public roads, the HSIP provides a funding source for local entities to develop countermeasures to improve bicyclist and pedestrian safety. Eligible projects include safety improvements for cyclists and pedestrians both on-road and on publicly owned bicycle and pedestrian pathways or trails.

More information: http://safety.fhwa.dot.gov/hsip/
http://www.fhwa.dot.gov/safetealu/factsheets/hsip.htm

High Risk Rural Road Program (HRRRP). As part of the FHWA's Highway Safety Improvement Program, the HRRRP aims to reduce fatal and incapacitating injury crash rates on rural major collectors, rural minor collectors, and rural local roads. Funds can be used for construction and operational improvements on high risk rural roads, as well as planning, preliminary engineering, and roadway safety audits related to specific high risk rural road improvements. Sample projects include pavement and shoulder widening, improvements for bicyclist and pedestrian safety, traffic calming features, and improvements to signage and pavement markings.

More information: http://safety.fhwa.dot.gov/safetealu/memos/memo051906.cfm
http://safety.fhwa.dot.gov/local_rural/training/fhwasa10012/

Transportation Enhancements Program (TE). A significant portion of Missouri's Surface Transportation Program funds are required to be set aside projects that increase transportation options, enhance the transportation experience, and provide a sense of place. TE projects must meet at least one of the twelve eligible categories, including trail and greenway development, landscaping and beautification, provision of safety and education programs for pedestrians and bicyclists, and historic preservation. A local match of 20 percent is required. The program is administered by Missouri Department of Transportation (MoDOT) in cooperation with East West Gateway Council of Governments.

More information: http://www.ewgateway.org./
http://www.enhancements.org/
http://www.fhwa.dot.gov/environment/te/

Congestion Mitigation and Air Quality Program (CMAQ). The CMAQ Program funds projects and programs that improve air quality by reducing automobile emissions. Potential projects include bicycle and pedestrian facilities, traffic flow improvements, diesel engine retrofits, and shared ride services.

More information: http://www.fhwa.dot.gov/environment/air_quality/cmaq/

State and Community Highway Safety Grant Program (Section 402). Section 402 Highway Safety Funds can be used to develop and support programs that aim to reduce traffic crashes and increase pedestrian safety. While these funds are more commonly used to increase law enforcement activities and develop statewide data systems, they can be utilized to develop safety education programs and community-wide pedestrian safety campaigns.

More information: http://safety.fhwa.dot.gov/policy/section402/
http://www.bikeleague.org/resources/reports/section402.php

Safe Routes to School (SR2S). Funding is available annually through the Missouri Department of Transportation through federal highway safety funds to provide for safe biking and walking infrastructure and behavior programs for children in grades K-8, including children with disabilities.

More information: http://www.modot.mo.gov/safety/SafeRoutestoSchool.htm
http://safety.fhwa.dot.gov/saferoutes/
http://www.saferoutesinfo.org/

Transportation, Community and System Preservation Program (TCSP). The Federal Highway Administration's TCSP program provides funding for planning grants, implementation grants, and research that investigates the links between transportation, community, and system preservation. The implementation grants have been used to fund pedestrian improvements, bike paths, multi-use paths, complete streets implementation, and other non-motorized transportation initiatives.

More information: http://www.fhwa.dot.gov/tcsp/projects.html

Recreational Trails Program (RTP). Grants are available for motorized and non-motorized trail development, renovation, and preservation for cities, counties, schools, and all business types. Projects require a 20% minimum match. The grant application period ends in August and is administered by the Missouri Department of Natural Resources-Division of State Parks. The funding is provided through the Federal Highway Administration.

More information: http://www.mostateparks.com/grantinfo.htm
http://www.fhwa.dot.gov/environment/rectrails/

Rivers, Trails and Conservation Assistance Program (RTCA). Administered by the National Parks Service, the RTCA works throughout the country to assist community-led natural resource conservation and outdoor recreation projects. While the RTCA does not provide direct funding for projects, they do provide valuable technical assistance for conceptual planning, capacity building, and organizational development.

More information: http://www.nps.gov/ncrc/programs/rtca/

Land & Water Conservation Fund (LWCF). Grants are available to cities, counties and school districts for outdoor recreation facilities, including trails. Projects require a 55% match. Funded facilities must remain for the purpose of public outdoor recreation in perpetuity. LWCF grants are funded by the US Department of Interior, National Park Service and administered by the Missouri Department of Natural Resources-Division of State Parks

More information: http://www.mostateparks.com/grantinfo.htm
http://www.nps.gov/lwcf/

The Kodak American Greenways Program. Funded by The Conservation Fund, Eastman Kodak Company, and the National Geographic Society, the program provides "seed" grants for the planning and design of greenways and other open space systems. Since 1989, the program has granted over $800,000 to nearly 700 organizations across the country.

More information: http://www.conservationfund.org/kodak_awards

Bikes Belong Grant Program. Bikes Belong, a national organization dedicated to putting more people on bikes more often. The organization funds multi-use trail projects, BMX facilities, mountain bike trails, and advocacy efforts, with a strong desire to leverage federal funding in the process. Bikes Belong has awarded over 200 grants since 1999, investing $1.7 million and leveraging close to $650 million in federal, state, and private sector funding.

More information: http://www.bikesbelong.org/grants/

Missouri Foundation for Health's Healthy and Active Communities Program. MFH, the state's largest healthcare foundation, works to improve health in the communities it serves. Through the H&AC program, MFH funds organizations to combat obesity through changes in policy, environment, and social networks. Funded projects include community-wide intervention strategies, bike-to-school programs, increasing multi-use trail accessibility, efforts to adopt complete streets policies, bike check-out programs, and other innovative programs and infrastructure improvements to increase physical activity.

More information: http://www.mffh.org/

Robert Wood Johnson Foundation. The Robert Wood Johnson Foundation (RWJF) is offers a wide range of funding opportunities dealing with healthy and active living. Anyone is eligible to apply, but check the website to make sure that you meet requirements per grant. For more information, check the website periodically for new calls for proposals.

More information: http://www.rwjf.org/applications/solicited/cfplist.jsp

Local Option Sales Taxes. 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 percent 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.

More information: http://www.moga.mo.gov/statutes/c600-699/6440000032.htm
http://www.mopark.org/displaycommon.cfm?an=1&subarticlenbr=29

Adopt a Bikeway/Sidewalk/Trail Program. Local organizations, businesses and community groups often engage in civic projects, including Adopt-A-Highway programs and other landscaping and beautification projects. The county could develop an "Adopt-A-Trail" or "Adopt-A-Sidewalk" program to assist in the routine maintenance or landscaping of the county's bicycle and pedestrian network.

County Funds. Approaching bikeway and pedestrian facility development from the perspective of return-on-investment, the county can maximize the use of local tax revenue by utilizing it as a match to obtain external funding. At the very least, for every three dollars of investment, the county can receive seven dollars in external funding to build the non-motorized transportation system. Another important measure of return-on-investment relates to the fact that Franklin County will not only develop major infrastructure improvements to its parks and recreation 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. Bond issues can also be considered as a supplement to the county's funding strategy.

Plan Adoption and Regulatory Actions

The following steps should be taken to implement the Franklin County Bikeable-Walkable Plan:

Adoption by Franklin County Commission. Adoption of the plan as a guide for policy development will establish a framework to ensure its implementation.

Park Land Dedication Program. The county 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 a greenway and trail infrastructure. Greenways are essentially linear parks and are therefore a legitimate dedication activity. Parklands have long been recognized as important elements in the improvement of recreation opportunities 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. 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. In addition, increased usage of trails and greenways can have a positive affect on adjacent retail and commercial activities. Examples include the following:

- (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….'[12]

- In suburban areas of Chicago, Tampa, Washington D.C., Seattle, and elsewhere,

[12] Little, Charles (1990). *Greenways for America.* Baltimore: John Hopkins University Press. P. 185

home-sale advertisements promote the properties' proximity to trails as a selling point. Evidence of advertising proximity to trails also exists in suburban developments throughout the St. Louis Metropolitan Area, including the Reserve at Chesterfield Village, which abuts the Chesterfield Riparian Corridor and promotes a neighborhood trail system and connection to the Riparian Corridor nature trail, and the Ashton Woods subdivision in Eureka, which advertises its " community parks and walking trails" on banners throughout the subdivision.[13]

- (On greenways in general) Increased tax revenues are usually generated by an increase in property values on land near the greenway….[14]

- '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.'[15]

- 'I strongly believe that the development of Downtown Park (Belleview, 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.'[16]

- (Pinellas Trail/Greenway, Pinellas County, Florida) ….In Oldona, adjacent to the trail, an upscale townhome community was developed that uses the word

[13] Flink, C., Olka, C., and Searns, R. (2001). *Trails for the Twenty-First Century* (Rev. ed.). Washington, D.C.: Island Press.

[14] Schwartz, L., ed. (1993). *Greenways: A guide to planning, design, and development*. Washington, D.C.: Island Press. P. 69.

[15] David Fisher, as cited in: Garvin, A. and Berens, G. (1997). *Urban parks and open space*. Washington, D.C.: ULI Press. P. 59

[16] Ibid. P. 78

> 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.'[17]

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.

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 they are used, non-motorized trail pass-throughs (similar to crosswalks but somewhat wider) should be required so that adjacent neighborhoods can be interconnected. These connections can play a role in helping to reduce motor vehicle trips within the county.

- Review/Modify Street Specifications. Specifications for street design and construction on planned bikeway segments should include the following, described by street type:

[17] Ibid. P. 176

- New four-lane collectors with no curbside parking should have curb lane widths of at least fourteen feet to permit lane sharing by both automobiles and bicyclists, or a minimum of four-foot shoulders on each side of the road to accommodate cyclists and pedestrians. Collectors with curb side parking should have parking lanes of at least sixteen feet to allow sufficient room for bicyclists to pass adjacent to opening car doors without the need to swerve into the motor vehicle lane.

- New two-lane collector roads should be designed either with wide curb lanes or paved shoulders, and posted with signs appropriate to the particular bikeway designation ("Share the Road with Bicycles" signs, "Bicycle Route" signs, or "Bicycle Lane" striping and appropriate signage).

- Arterials should include five-foot wide striped and stenciled bike lanes as well as "Share the Road with Bicycles" signs and posted with somewhat lower speed limits consistent with published bikeway guidelines.

- Review Pedestrian Facility Requirements. Consider sidewalks on both sides of the street with minimum four-foot widths on residential streets, five- to six-foot widths on collectors and arterials, and wider sidewalks in higher density commercial districts.

- Sidewalk Buffers. Residential streets should be separated from sidewalks by grass and landscaped strips to provide a more effective buffer from auto traffic. In addition to providing comfort and a sense of safety for pedestrians, these buffers also have a traffic calming effect on motor vehicles.

- 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 an evolving field.

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

Encouragement, Education and Enforcement Programming

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.[18] 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 and pedestrian activity 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 and pedestrian activity in Franklin County. The recommendations are principally derived from several sources including Michael Replogle[19] and the Bicycle Federation of America.[20] It provides a framework within which bicycling and walking 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 Franklin County:

- 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.

[18] Bicycle Institute of America (1993). *Bicycling reference book, 1993-1994 Ed.* P. 6.
[19] Repogle, M. (1983). *Bicycles and public transportation: new links to suburban transit markets*. Washington, D.C.: Bicycle Federation of America. P. 27.
[20] Bicycle Federation of America (1991). *Non-motorized travel facilities integration project: Summary recommendations*. Washington, D.C.: Bicycle Federation of America.

- Facilities Guide/Brochure. Develop and distribute a guide or brochure that displays a map of the existing bicycle-pedestrian system, including designated on-street bikeways, linear trails, and loop trails. Additional information should be provided in the brochure or guide relating to trail surfaces, facility lengths, trail etiquette, facility user types (advanced, basic or child), and basic safety information for cyclists and pedestrians. The guide or brochure should be updated as additional facilities are constructed. Bloomington, Minnesota's *Hiking and Biking Trails Guide* is an excellent example of an informative and comprehensive guide to encourage bicycling, walking and hiking. A link to this guide can be found in Appendix D: Additional Resources.

Illustration 39: Bloomington, MN's Hiking and Biking Trails Guide (Source: http://www.ci.bloomington.mn.us).

- Special Events and Activities. Encourage local communities to host or sponsor events and activities that encourage walking and bicycling. Local school districts, healthcare providers, government health agencies, bicycle shops and other community groups and organizations often promote bicycle rides, run/walk events, walking school buses, walking groups and similar events to promote healthy and active living. These events can play a vital role in encouraging local residents and visitors alike to use Franklin County's network of bicycle and pedestrian facilities for transportation and recreation purposes. With a significant number of existing bicycling and walking facilities geographically dispersed throughout the county, many residents already have access to walking and biking

Illustration 40: A group of teen and young adults enjoy a Thursday evening group ride on the streets and trails of Washington, hosted by Revolution Cycles, Franklin County's only bicycle shop (Source: Joe Ferguson).

opportunities. These events can help to market Franklin County's existing, developing and planned trails and bikeways as a valuable asset to residents throughout the county.

- Bike Lockers, Racks, and Shower Facilities. Encourage larger employers to provide bike lockers or racks, and to install showers to promote commuting. The Association of Pedestrian and Bicycle Professionals published a brief report entitled *Bicycle Parking Guidelines* to assist in the design and installation of bicycle racks. A link to this guide is included in Appendix D.

Education Activities. This category addresses the need to learn educate current and future cyclists and pedestrians of the basic skills and 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.

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 basic cycling skills and 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.

- Incorporate basic education/safety language into brochures and maps.

- Incorporate bicycle-pedestrian education/safety messages into other literature produced by the park department.

- Stock and distribute copies of bicyclist and pedestrian safety material. The Missouri Department of Transportation publishes pamphlets on both bicycle and pedestrian safety. These publications are available free of charge for government agencies, advocacy organizations, and all Missouri residents.

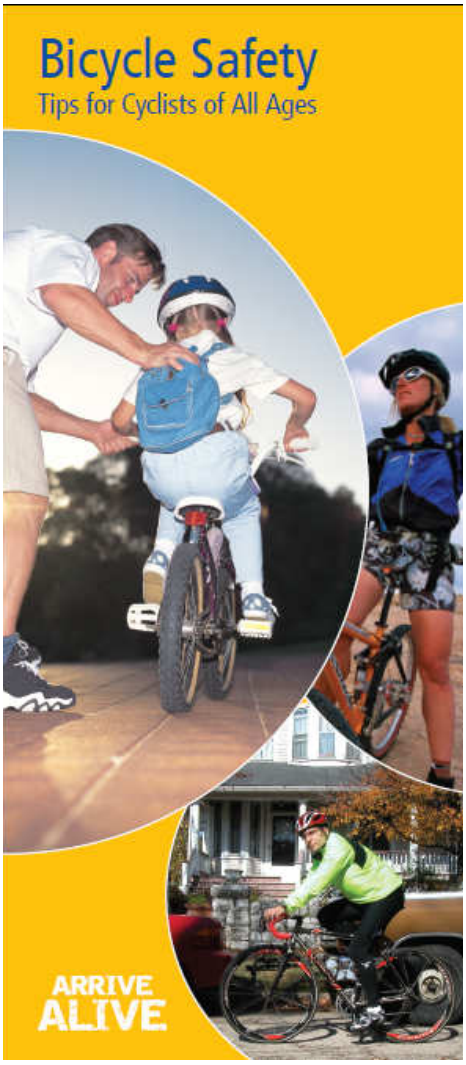

Illustration 41: MoDOT's safety brochures can help provide valuable information for current and potential cyclists and are available free of charge.

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

- Establish basic rules and regulations for trails under the county's jurisdiction. These rules and regulations can be incorporated into the bicycle and pedestrian guide/brochure, accompanying the map of existing trail and bikeway facilities.

- Obtain and distribute copies of appropriate bicycle-pedestrian safety information produced by one of the referenced sources.

- Stock supplies of bicycle-pedestrian safety material, maps, and rules of the road at kiosks or other stations within parks.

- Establish police, park ranger, or volunteer patrol presence on trails. Issue courtesy slips to trail users who are not aware of rules.

- 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.

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

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

- Consider establishment of a bicycle registration requirement.

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

Monitoring and Evaluation

The implementation of the Franklin County Bikeable-Walkable Community Plan should be monitored by representatives of the county, 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 County Commission should be made including recommendations as to whether program resources, scoping, or timetables should be modified.

A. **MoDOT Engineering Policy Guide**

The Missouri Department of Transportation has developed a series of policy guidelines for the planning, design, engineering, and construction of bicycle and pedestrian facilities. These guidelines should be referenced during plan implementation to ensure consistency in facility design. The Engineering Policy Guide and its bicycle and pedestrian sections can be found online at the following addresses:

MoDOT Engineering Policy Guide:
http://epg.modot.mo.gov/

Category 641: Bicycle Facilities:
http://epg.modot.mo.gov/index.php?title=Category:641_Bicycle_Facilities

Category 642: Pedestrian Facilities:
http://epg.modot.mo.gov/index.php?title=Category:642_Pedestrian_Facilities

The Engineering Policy Guide also contains links to additional resources for the design, engineering, construction, maintenance and evaluation of bicycle and pedestrian facilities.

B. Excerpt from *Selecting Roadway Design Treatments to Accommodate Bicycles* by the Federal Highway Administration

A link to the full document is included in Appendix D.

Table 6. Group B C bicyclists, rural section.

average motor vehicle operating speed	average annual daily traffic (AADT) volume											
	less than 2,000			2,000-10,000			over 10,000					
	adequate sight distance		inadequate sight distance	adequate sight distance		inadequate sight distance	adequate sight distance		inadequate sight distance			
		truck, bus, rv			truck, bus, rv			truck, bus, rv				
less than 30 mi/h	sh 4	sh 4	sh 4	sh 4	sh 4	sh 4	sh 4	sh 4	sh 4	sh 4	sh 4	sh 4
30-40 mi/h	sh 4	sh 4	sh 4	sh 4	sh 6	sh 4	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6
41-50 mi/h	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6
over 50 mi/h	sh 6	sh 6	sh 6	sh 8	sh 8	sh 8	sh 8	sh 8	sh 8	sh 8	sh 8	sh 8

1 mi/h - 1.61 km/h

Key:*

wc - wide curb lane **sh** - shoulder **sl** - shared lane **bl** - bike lane **na** - not applicable

* See page 11 for definitions

C. Background Information on Opinions of Probable Cost

The pre-engineering opinions of probable cost developed in the Plan Chapter of this study were based on the experience of the planning consultants over the past ten years and took into consideration the planning, design, and development of many bikeway projects in the St. Louis Region and beyond. Because this is a planning document intended to precede the detailed plans, specifications and estimates (PS&E) to result during a subsequent development phase, they cannot reflect current conditions in the engineering and construction industry, or current market prices for materials used in the construction of such facilities.

Rough Order of Magnitude Bike/Ped Facilities Development Costs

Bike Accommodations. Recommended improvements are "Share the Road" signs every quarter to fifth of a mile. MODOT policy calls for use as a warning sign: "The Share the Road (W16-1) sign may be used with other appropriate warning signs to advise the motorists that other modes of transportation may be present on the same facility. This can include, but is not limited to, pedestrians, bicycles, horse drawn vehicles, etc. The (W16-1) sign shall not be used alone but always as a supplementary plaque under a W11 series sign." The W-11 sign may be used on its own to designate bike routes. 8-10 signs per mile and installation labor: $2,250/mile

Bike Routes. Recommended improvements for bike routes include installing "Bicycle Route" and "identification/directional" signs every 1/4-mile and at turns/intersections and installing new drainage grates. The cost estimate does not include bike stencils or striping which is only used when a bikeway is designated as a bike lane, as discussed in the next example.

A bike route system of bike routes may lend itself to community maps and guidance to areas of interests, as is used by Bike St. Louis, shown in the upper left image. Or it may simply utilize the standard "Bike Route" sign shown on the lower left.

- Average of 10 signs per mile and installation labor: $2,500/mile
- Allowance for grate improvements (lump sum): $1,000/mile
- Budget cost per mile: $3,500/mile
- Construction cost per mile of additional 4' shoulder: $145,000/mile

Bike Lanes on Existing Pavement. Recommended improvements include signage, drainage grate improvements, striping and bike route stencils (note: stencils will not be used on streets that will be chip and sealed). Where roads cannot be widened, but there is adequate lane width, some agencies are creating bike lanes without stripes. Some agencies narrow the inner lanes to provide additional outer lane width, for example creating a four lane road of 14' 10' 10' 14' rather than four 12' lanes.

- Average of 10-12 signs per mile & installation: $2,500/mile
- Thermoplastic striping (both sides of street, appr. $2/lf): $10,500/mile
- Allowance for grate improvements (lump sum): $1,000/mile
- Allowance for bike stencils (bike and lettering at intersections, 10/mile x $100): $1,000/ mile
- Allowance for intersection striping (400' of bike slot striping and 8 stencils and "yield to bikes" signs): $2500/intersction
- Budget cost for bike lanes on existing pavement: $17,500/mile

Bike Lanes on pavement widened by 5 feet. Includes all of the above improvements and adds in new 5' wide bike lane construction. The 5' wide bike lane should meet AASHTO standards.

- Average of 10-12 signs per mile & installation: $2,500/mile
- Thermoplastic striping (both sides of street, approx. $2/lf): $10,500/mile
- Allowance for grate improvements (lump sum): $1,000/mile
- Allowance for bike stencils at intersection (bike and lettering, 10/mile x $100): $1,000/mile
- Allowance for intersection striping (bike slot, 400' of striping and 8 stencils and "yield to bikes" sign): $2,500/intersction
- Add $300,000-360,000/ mile for 5' wide lanes, both sides: $330,000/mile
- Budget cost per mile of widened pavement: $347,500/mile

Shared Use Paths, Nature Trails & Walks and Nature/Foot Paths.

1. Asphalt Trail with Improvements. Recommended improvements call for a 10-12' wide asphalt trail, grading/clearing, 8" of base rock and 4' of asphalt, some bridge work, signage and landscaping. $65/lf x 5280=$316,800/mile.

2. Asphalt Trail only with no other improvements-10-12 feet wide, 8" of base rock and 4" of asphalt, no signs, landscaping or bridges. Trail on grade w/ minimum excavation—basically for the trail bed only, 2' shoulders on each side. $45/lf X 5,280=$237,600/mile

3. Crushed rock trail -8-10' wide, trail on grade, minimum excavation—basically for the trail bed only, no signs, landscaping or bridges. Contracted price of $15/lf or $79,200/mile.

4. Nature/Foot Path - Often times a scout or local community group can install wood chips as a service project at no charge to the community. For our purposes allow for $1.20 per lf or $6,350/mile.

5. Concrete Walk - Recommended improvements feature 8' wide concrete walks.8' x $5/sf= $40/lf or $211,200/mile.

6. Sidewalks along new subdivisions are recommended to be at least 5' wide.
5' wide x $5 sf = $25/lf or $132,000/mile. Note: Does not include land acquisition, engineering, design, construction management, inflation or maintenance.

<u>Facility Maintenance.</u> Costs associated with facility maintenance and repair should be incorporated into planning and budgeting considerations. The following average annual costs are based on a sampling of maintenance costs from projects in the region and, where necessary, supplemented with national data as well.

- Shared Use Asphalt Trail: mowing, cleaning, trimming, litter control, periodic crack sealing, pavement repair, and seal coating. $9,000/mile.

D. **Recommended Project Prioritization - Complete Table**

The table below displays each project's score based on the criteria listed on pages 65 and 66 of the report. The criteria categories and maximum value per category are as follows:

- Proximity to Residential Parcels 20 pts. max
- Connections to Parks & Open Space 20 pts. max
- Connections to Local Schools 15 pts. max
- Connections to Tourist Destinations 15 pts. max
- Connections to Planned Routes 10 pts. max
- Overlap with Long Range Transportation Plan 10 pts. max
- Overlap with Future Land Use Development Areas 10 pts. max

Project Prioritization - Tier One Project Scores

Tier	Rank	Type	Street	Length (mi)	Limit To	Jurisdiction	Cost (Signage)	Cost (Const.)	Total Cost	Suitability
Tier One	1	W.A.	Route 66	29.3	Southern County Boundary to Eastern County Boundary	Mixed	$66,505	$0	$66,505	N
	2	B.R.	Hwy 30	13.1	Commercial Avenue to Eastern County Boundary	State	$45,788	$1,277,046	$1,322,835	Partial
	3	B.R.	Hwy 100	41.7	Western County Boundary to Eastern County Boundary	State & City	$145,239	$3,679,067	$3,824,306	Partial
	4	B.R.	Old Hwy 100 - North	6.9	Washington City Limits to Highway 100	County	$23,958	$0	$23,958	Y
	5	B.R.	Hwy O	11.7	Highway AT to Eastern County Boundary	State	$40,797	$962,024	$1,002,821	Partial
	6	B.R.	Hwy 47	14.3	Commercial Avenue to Northern County Boundary	State & City	$49,716	$1,853,574	$1,903,290	Partial
	7	W.A.	Hwy W	1.7	Sand Ford Road to terminus	State & State-Special	$3,786	$0	$3,786	N
	8	B.R.	Hwy T	3.8	Highway 100 / Highway V to Highway MM	State	$13,079	$0	$13,079	Y
	9	B.R.	Hwy 50 (Union West)	17.7	Western County Boundary to Highway BB	State	$61,708	$2,567,627	$2,629,335	N
	10	W.A.	Hwy N	5.6	Planned Pacific Brush Creek Greenway to Jefferson	State	$12,773	$0	$12,773	N
	11	B.R.	Old Gray Summit	3.8	Highway 100 to Highway N	County, Mixed & City	$13,254	$551,502	$564,756	N
	12	W.A.	Robertsville	4.3	Highway 100 to Highway O	County	$9,711	$0	$9,711	N

Project Prioritization - Tier One Project Scores

Tier	Rank	Street	Residential	Parks/Open Space	Schools	Tourist Destinations	Connections to Planned Routes	LRTP	Development Areas	Total
Tier One	1	Route 66	20	20	15	9	9	0	10	83
	2	Hwy 30	17	18	10	0	2	10	10	67
	3	Hwy 100	13	9	11	12	10	0	10	66
	4	Old Hwy 100 - North	14	12	6	15	2	0	10	58
	5	Hwy O	9	9	6	12	2	0	10	47
	6	Hwy 47	8	9	3	0	5	10	10	45
	7	Hwy W	6	6	5	15	1	0	10	43
	8	Hwy T	8	12	3	6	3	0	10	42
	9	Hwy 50 (Union West)	3	4	2	6	3	10	10	38
	10	Hwy N	4	7	4	0	2	10	10	37
	11	Old Gray Summit	2	2	0	6	2	10	10	33
	12	Robertsville	3	4	1	0	1	10	10	29

Project Prioritization - Tier Two Project Scores

Tier	Rank	Type	Street	Length (mi)	Limit To	Jurisdiction	Cost (Signage)	Cost (Const.)	Total Cost	Suitability
Tier Two	1	W.A.	Hwy T	8.3	Highway MM to Eastern County Boundary	State	$18,945	$0	$18,945	N
	2	W.A.	Hwy N	8.1	Highway O to Highway 30	State	$18,335	$0	$18,335	N
	3	W.A.	Bassett	2.5	Highway T to Eastern County Boundary	County	$5,771	$0	$5,771	N
	4	B.R.	Hwy 185	7.4	Southern County Boundary to Elmont Rd	State & City	$25,648	$828,549	$854,197	Partial
	5	W.A.	Hwy A	3.9	Country Club Road to Independence Road	State	$8,867	$0	$8,867	N
	6	W.A.	Country Club	1.9	Highway A to Highway 47 (Planned Connection)	County	$4,388	$0	$4,388	N
	7	W.A.	Hwy W	1.9	Interstate 44 to Sand Ford Rd	State	$4,304	$0	$4,304	N
	8	B.R.	Route 66 - Commercial	1.1	Gravois Rd to Highway 47	State & City	$3,659	$0	$3,659	Y
	9	W.A.	Hwy B (West)	1.4	Highway 100 to Market Street	State	$3,267	$0	$3,267	N
	10	W.A.	Elmont	0.5	Highway H to Elmont Planned Bike Route	State	$1,210	$0	$1,210	N
	11	W.A.	Bernhardt	1.6	Highway H to Highway Y	State	$3,639	$0	$3,639	N
	12	W.A.	Market	0.6	Highway B (west) to Highway B (east)	State	$1,300	$0	$1,300	N
	13	W.A.	Hwy MM	4.1	Highway T to Highway 100	State	$9,386	$0	$9,386	N
	14	B.R.	Route 66 - Hwy AT	4.8	Highway 50 / Service Road to Highway 100	State	$16,615	$0	$16,615	N
	15	W.A.	Jefferson	0.3	Highway N to Highway HH	State	$752	$0	$752	N
	16	W.A.	Hwy KK	5.0	Highway 185 to Highway 100	State	$11,329	$0	$11,329	N
	17	W.A.	Hwy B (East)	6.7	Highway 100 to Market Street	State	$15,142	$0	$15,142	N
	18	W.A.	Hwy OO	3.3	Highway 100 to Interstate 44	State	$7,551	$0	$7,551	N
	19	B.R.	Hwy 50 (Union East)	4.9	Bourbeuse Rd to Highway AT / Service Road	State	$16,989	$0	$16,989	Y

Project Prioritization - Tier Two Project Scores

Tier	Rank	Street	Residential	Parks/Open Space	Schools	Tourist Destinations	Connections to Planned Routes	LRTP	Development Areas	Total
Tier Two	1	Hwy T	3	4	3	6	3	0	10	28
	2	Hwy N	1	0	0	3	2	10	10	26
	3	Bassett	4	7	3	0	1	0	10	25
	4	Hwy 185	6	6	1	0	2	0	10	24
	5	Hwy A	0	0	0	0	2	10	10	22
	6	Country Club	3	4	2	0	2	0	10	21
	7	Hwy W	4	2	4	0	1	0	10	21
	8	Route 66 - Commercial	2	3	1	0	2	0	10	19
	9	Hwy B (West)	3	3	1	0	2	0	10	18
	10	Elmont	1	2	3	0	1	0	10	17
	11	Bernhardt	2	2	1	0	2	0	10	17
	12	Market	3	1	1	0	1	0	10	16
	13	Hwy MM	2	1	1	0	2	0	10	15
	14	Route 66 - Hwy AT	1	1	1	0	3	0	10	15
	15	Jefferson	0	1	0	3	1	0	10	15
	16	Hwy KK	2	2	1	9	1	0	0	15
	17	Hwy B (East)	1	0	1	0	2	0	10	14
	18	Hwy OO	0	1	0	0	2	0	10	13
	19	Hwy 50 (Union East)	1	0	0	0	2	0	10	13

Project Prioritization - Tier Three Project Scores

Tier	Rank	Type	Street	Length (mi)	Limit To	Jurisdiction	Cost (Signage)	Cost (Const.)	Total Cost	Suitability
Tier Three	1	W.A.	Hwy AF	3.2	Ridge Road to Bud Road	State	$7,153	$0	$7,153	N
	2	B.R.	Old Hwy 100 - South	1.5	Highway 100 to Highway AT	County	$5,264	$0	$5,264	Y
	3	W.A.	Hwy V	7.7	Highway 100 to Highway 47	State	$17,405	$0	$17,405	N
	4	W.A.	Hwy HH	0.3	Jefferson to Highway O	State	$661	$0	$661	N
	5	W.A.	Hwy BB	3.1	Highway A to Highway 50	State	$7,000	$0	$7,000	N
	6	W.A.	Fiddle Creek	3.6	Highway T to Highway 100	County	$8,123	$0	$8,123	N
	7	W.A.	Stone Church	5.3	Highway E to Highway Y	County	$12,025	$0	$12,025	N
	8	W.A.	Spring Creek	4.8	Highway 185 to Lollar Branch	County	$10,861	$0	$10,861	N
	9	W.A.	Hwy YY	2.6	Highway Y to Highway C	State	$5,898	$0	$5,898	N
	10	W.A.	Hwy 47	9.3	Southern County Boundary to Gravois Road / Highway 30	State	$21,080	$0	$21,080	Y
	11	W.A.	Hwy FF	8.4	Highway 30 to Highway 47	State	$18,973	$0	$18,973	N
	12	W.A.	Hwy YY	10.8	Highway C to Highway A	State	$24,500	$0	$24,500	N
	13	W.A.	Hwy AC	1.9	Jake's Prarie to Highway 185	State	$4,279	$0	$4,279	N
	14	W.A.	Hwy C	14.4	Highway 50 to Highway 100	State	$32,652	$0	$32,652	N
	15	W.A.	Hwy E	6.1	Stone Church Rd to Highway 100	State	$13,919	$0	$13,919	N
	16	W.A.	Hwy Y	8.8	Highway YY to Bernhardt Road	State	$20,016	$0	$20,016	N
	17	W.A.	Jake's Prairie	1.9	Highway H to Highway AC	County	$4,266	$0	$4,266	N
	18	W.A.	Hwy 185	20.4	Highway KK to Highway AC	State	$46,385	$0	$46,385	N
	19	W.A.	Hwy K	14.3	Highway 185 to Gravois Road / Highway 30	State	$32,567	$0	$32,567	N
	20	W.A.	Hwy H	19.1	Elmont Road to Bernhardt Road	State	$43,256	$0	$43,256	N
	21	W.A.	Lollar Branch	3.0	Spring Creek Road to North Service Road	County	$6,824	$0	$6,824	N
	22	W.A.	Ridge	4.6	Highway AF to Spring Creek Road	County	$10,553	$0	$10,553	N
	23	W.A.	Hwy VV	4.5	Highway 100 to Highway E	State	$10,214	$0	$10,214	N

Project Prioritization - Tier Three Project Scores

Tier	Rank	Street	Residential	Parks/Open Space	Schools	Tourist Destinations	Connections to Planned Routes	LRTP	Development Areas	Total
Tier Three	1	Hwy AF	4	3	2	3	1	0	0	13
	2	Old Hwy 100 - South	0	1	0	0	2	0	10	12
	3	Hwy V	0	1	0	0	2	0	10	12
	4	Hwy HH	1	1	0	0	1	0	10	12
	5	Hwy BB	0	1	0	0	1	0	10	12
	6	Fiddle Creek	0	0	0	0	2	0	10	12
	7	Stone Church	1	3	0	6	2	0	0	11
	8	Spring Creek	3	2	4	0	2	0	0	10
	9	Hwy YY	0	4	0	3	2	0	0	9
	10	Hwy 47	0	3	0	3	1	0	0	7
	11	Hwy FF	2	2	1	0	1	0	0	6
	12	Hwy YY	1	2	1	0	3	0	0	6
	13	Hwy AC	2	3	0	0	1	0	0	6
	14	Hwy C	0	1	0	3	2	0	0	6
	15	Hwy E	1	1	1	0	2	0	0	5
	16	Hwy Y	1	1	0	0	3	0	0	5
	17	Jake's Prairie	1	1	1	0	2	0	0	4
	18	Hwy 185	0	0	0	0	3	0	0	3
	19	Hwy K	2	1	0	0	1	0	0	3
	20	Hwy H	1	1	0	0	2	0	0	3
	21	Lollar Branch	0	1	0	0	2	0	0	3
	22	Ridge	1	0	0	0	2	0	0	2
	23	Hwy VV	0	1	0	0	1	0	0	2

E. Additional Resources

Provided below is a list of additional resources and documents to help in the implementation of the Chesterfield Bikeable Walkable Community Plan.

Association of Pedestrian and Bicycle Professionals - Bicycle Parking Guidelines.
http://www.apbp.org/resource/resmgr/publications/bicycle_parking_guidelines.pdf

Bloomington, Minnesota Hiking and Biking Trails Guide.
www.ci.bloomington.mn.us/handouts/66hbguide.pdf

Federal Highway Administration - *Selecting Roadway Design Treatments to Accommodate Bicycles*.
http://www.bicyclinginfo.org/library/details.cfm?id=3453

St. Louis Regional Bicycling and Walking Transportation Plan.
http://www.ewgateway.org/pdffiles/library/trans/bike-ped/bikeplan-05/BikePlan-CompleteDoc.pdf