



# KIRKWOOD PEDESTRIAN AND BICYCLE PLAN

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PLEASE SEE PLAN SUPPLEMENT, "COMMUNITY FEEDBACK" FOR PUBLIC COMMENTS

## Introduction

In 2014, the City of Kirkwood started working with Trailnet to create a 15-year plan for enhancing walking and biking in streets and in parks in Kirkwood. The Kirkwood Pedestrian and Bicycle Master Plan will help the City make decisions to leverage the limited funding available for biking and walking, including:

- Prioritize investments in walking and biking based on cost, available right-of-way, and strengthening the overall network;
- Encourage routine maintenance and upgrades to be opportunities to improve the biking and walking network;
- Strengthen applications for state and federal funding; and
- Identify opportunities for encouragement, education, enforcement, and evaluation.

The planning process was initiated in the beginning of 2014 and was finished in February 2015. The plan encompasses the City of Kirkwood. Connections to planned and existing routes in the Great Rivers Greenway network were also considered. The elements of that planning process are shown in Figure 1.

The vision of the residents of Kirkwood was the basis for the planning recommendations. Their vision of Kirkwood as a walkable and bikeable community, along with the needs identified in the outreach process, guided the planning priorities, and are integrated throughout the plan.

The planning approach centered on broad community engagement to develop a robust dialogue around the possibilities and challenges in Kirkwood. Trailnet worked with the City staff to identify community events where the planning team could reach out to residents. Working with the Planning Advisory Committee, the planning team hosted an Early Action Project designed to engage residents in their community.

A diagram showing the planning process and how community input was integrated throughout is on the next page.

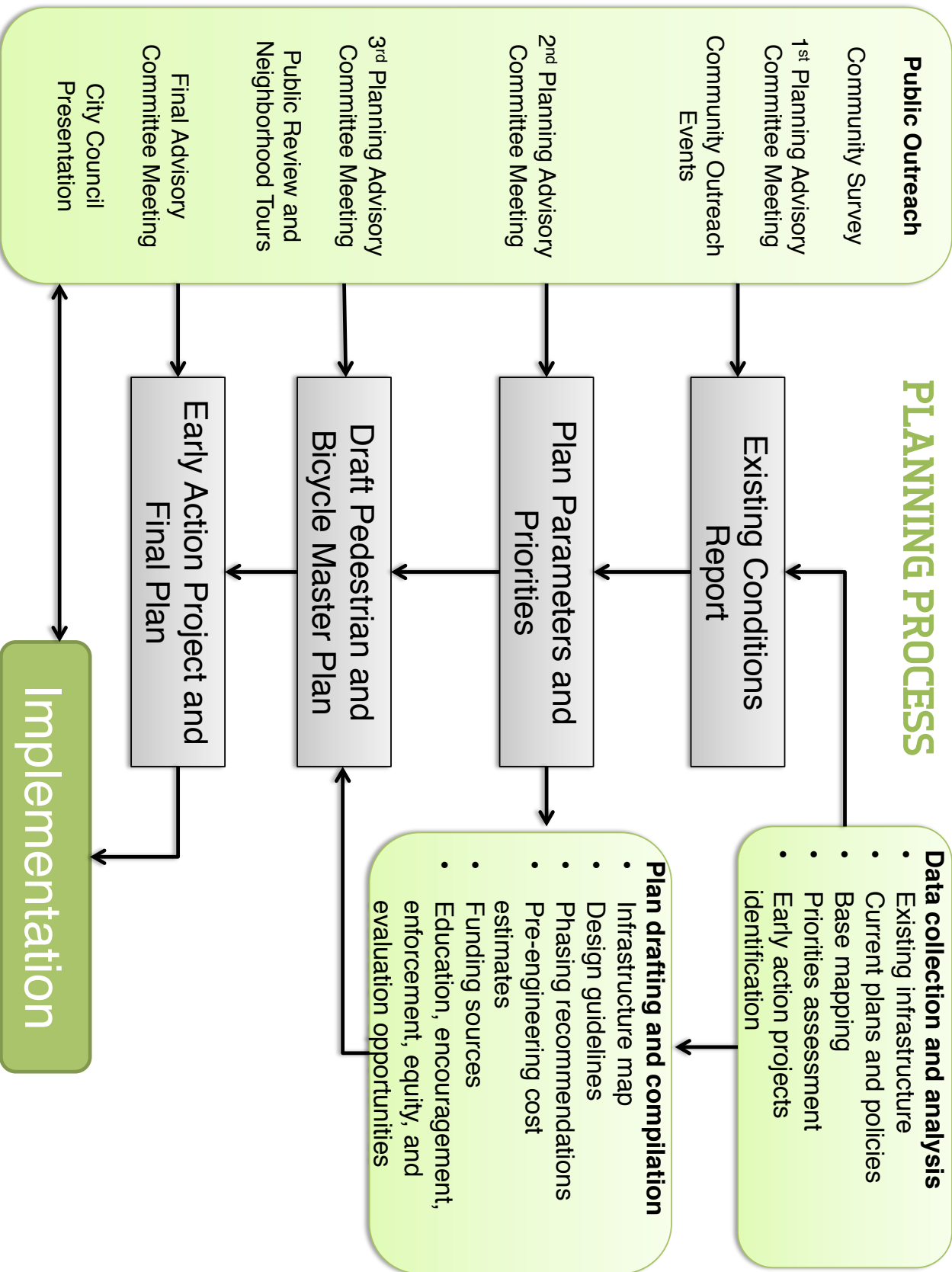


*Planning Advisory Committee Meeting*



*Mayor McDonnell is active in working for better walking and biking in Kirkwood.*

Figure 1: Planning Process



## Benefits of a walkable and bikeable community

In a recent national report on walkable urbanism and its market impacts, Kirkwood was identified as the only Walkable Urban Place in Saint Louis County outside of the central corridor along I-64. The national study that recognized Kirkwood's walkability found that walkable urban places have had strong market success and are likely to have high demand in the future.<sup>1</sup>

Building on current success will allow Kirkwood to become a more vibrant place and a premier community of choice in the region. Results from other cities suggest walkable and bikeable streets attract investment, increase property values, reduce congestion, and cost less to build and maintain than traditional roads. A few of these indicators can be found in the following references:

- The National Realtor's Association 2013 Community Preference Survey found that 60% of respondents prefer walkable neighborhoods, with a mix of housing and businesses, compared to neighborhoods that require driving between destinations.<sup>2</sup>
- In Memphis, a commercial district reported a 50% increase in commercial rents after striping bike lanes.<sup>3</sup>

1 Walkable Urban Places Report Page 29 of Appendices  
 2 Wardlaw, Michelle. Realtors report Americans prefer to live in mixed-use, walkable communities. National Association of Realtors. Web. 23 July 2014.  
 3 Marohn, Charles. Guerrilla Painting. Strong Towns, April 2012. Web. 8 March 2013.

- When San Francisco improved biking and walking access on Valencia Street, two-thirds of merchants said the increased levels of bicycling and walking improved business.<sup>4</sup>

By becoming one of the best places to walk and bike in the region, Kirkwood can increase home values, improve residents' access to local shopping and schools, and attract regional residents to local businesses.

### Population trends

While Kirkwood's population has declined somewhat since reaching a peak population of 31,679 in 1970, the US Census Bureau currently projects slight growth in the city's population. According to the 2010 Census, Kirkwood's population was 27,540, a slight increase from its 2000 population of 27,324.

The US Census Bureau's population forecasts do not take into account the growing interest in traditional, walkable communities. Across the country, and in the region, baby boomers and millennials are choosing to live in more traditional neighborhoods with walking, biking, and shopping.<sup>5</sup> It is reasonable to expect that with access to walking, biking, and shopping, Kirkwood will attract residents that demand better walking and biking.

4 Drennan, Emily. Economic Effects of Traffic Calming on Small Businesses. Department of Public Administration, San Francisco State University, December 2003. Web. 8 March 2013.  
 5 Leinberger, Christopher B and Mariela Alfonso-Walk. This Way, Brookings Institution. Web. 23 July 2014.



*During the outreach process, several young families said they chose to live in Kirkwood based on walkability.*

### Demographics and transportation choices

Shifting preferences in travel modes can be seen in the numbers of vehicle miles traveled (VMT) in the St. Louis region. Between 2007 and 2011, the number of vehicle miles traveled (VMT) decreased 4.5% in Saint Louis County, well over the national decline of 2.8%.<sup>6</sup> The decline in driving is likely the result of a combination of factors. Higher unemployment and rising gas prices are obvious factors, but do not fully account for the drop in driving. Several larger social trends, such as the Baby Boomers retiring and younger people becoming interested in walking, biking, and taking transit, could also be contributing to the decline.

Kirkwood has a number of senior living centers, and the 2012 American Community Survey (ACS) estimated 17.2% of residents

6 East West Gateway Blog. The roads less traveled- vehicle miles traveled on the decline in the St. Louis region. East West Gateway Website, 28 May 2013. Web. 23 July 2014.



*Kirkwood residents enjoy walking, biking, and driving.*

in Kirkwood were over 65. The travel needs of these retirees will focus more on visiting family, shops, friends, houses of worship, and parks and recreational destinations, instead of commuting. As Kirkwood has strong local retail, recreational, and dining options, many of these trips may be within walking and biking distance. By creating streets that invite residents to walk and bike, Kirkwood can help residents choose to visit local businesses on foot or by bike, rather than drive out of the area.

There are also a number of residents who cannot drive due to age, health, or lack of access to a vehicle. In 2012, the ACS found that 5.3% of Kirkwood households did not have access to a car. In addition to these households, 17.7% of the population under 16 and depends on being driven, walking, biking, or taking transit. Driving ability declines with age, and it is also reasonable that some of the 8.7% of Kirkwood residents over 75 may be aging out of driving. These numbers underscore the importance of a transportation system that allows residents to bike, walk and take transit safely in order to access daily needs and enjoy a high quality of life.

### **Housing and transportation costs**

The combined cost of housing and transportation in a community play a large role in whether or not it is affordable. Making sure that residents have cost-efficient transportation choices like walking, biking, and transit, can help families afford housing in their desired neighborhood. Housing affordability is generally defined as 30% of income or

less, based on the rent threshold for rental programs in the US, and the general lending guidelines used by Fannie Mae and Freddie Mac. In Kirkwood, over ¼ of households spend more than 30% of their income on housing, and most of those residents (19.5% of the total population), spend over 35% of their income on housing, according to the 2007 – 2011 ACS.

Improving transportation options is one way to help families manage the cost of living. Making biking and walking easier, can help families choose to reduce transportation costs by biking, walking, or taking transit. For some households, being able to access schools, shops, or even jobs by foot or bike can even let them choose to have fewer cars, a large cost-savings. Education and encouragement can also help residents become more aware of the transportation options already existing in the community.

In general, a combined housing and transportation cost of 45% of household income is considered affordable. Based on the Location Affordability Portal, a tool produced by the US Department of Transportation, the average combined cost of housing and transportation in Kirkwood is 50% of the median income in the St. Louis region. For a retired couple, the average cost of housing and transportation is 54% of the typical retirement income in the region. While Kirkwood exceeds the affordability for the median income household in the region, Kirkwood does have a higher median household income. This means average housing and transportation costs make up 36% of the median income in Kirkwood.



*Being able to walk to local destinations can reduce transportation costs for families.*

# Existing Conditions

## Overview

Strategic investments in walking and biking can improve quality of life and health for residents and ease congestion and parking demand. The following analysis looks at how to expand support for walking and biking in order to improve life and business in Kirkwood.

### Land use and transportation network

The City of Kirkwood was founded in 1853 before motor vehicles or modern bicycles. As such, the traditional neighborhoods were designed on a walkable scale, and were served by the Pacific rail line. Currently, the Kirkwood Amtrak station is still an important part of the community and is used by residents throughout the region for long distance trips.

The city has grown, and now contains roughly three distinct urban forms: Traditional Town Center, Suburban Commercial, and Suburban Residential. Each of these development patterns offers different opportunities for improving walking and bicycling, and demand solutions that address the particular situation.

#### 1. Traditional town center:

Based around the Amtrak station, Kirkwood's historic town center was designed for walking, with commercial buildings, civic buildings and residences all within walking distance of the station. Kirkwood's walkable heritage is a

unique advantage in attracting and retaining retail, offices, and residents. The traditional neighborhoods are thriving, and attracting residents. The walkable downtown brings people from all over the region to Kirkwood's restaurants and retail.

Kirkwood can build on the strength of the existing areas, and extend the vibrant retail areas along Kirkwood Road through street design that prioritizes safe and comfortable walking. The section of Kirkwood Road that serves downtown is a great example of a road diet that slows traffic, allows for parking, and contributes to a vibrant downtown. Extending the road diet several blocks north and south is an opportunity to strengthen walking and biking in the core, where it can boost retail and residential demand.

The Amtrak station also offers the opportunity to attract tourists to Kirkwood; several other towns in Missouri attract tourists who arrive by rail to explore historic cities and enjoy nearby bicycle trails. For tourists visiting by rail, a pleasant walking environment is crucial, as they will not be driving. The Amtrak trains in Missouri allow bicycles, and there is high demand for visiting trails via Amtrak. A high-quality bicycle connection to Grant's Trail will help K wood attract tourists interested in exploring bicycle trails.

In order to enhance the traditional town center, the focus should be on prioritizing walking, including fully connecting the street grid, enhancing crosswalks, and traffic calming, as needed. Improving bicycling

within the traditional town center will expand transportation options for residents. The well-connected street grid and low-traffic streets serve experienced bicyclists well. However, neighborhood greenways and enhanced crossings at major arterials can make bicycling a safer and more viable choice for a larger number of residents.

#### 2. Suburban commercial:

The commercial development along Manchester Road and near the I-44 interchange on Kirkwood Road was designed to serve customers arriving by car. These businesses rely on access for drivers, and this is unlikely to change during the life of the plan.

However, pedestrians and bicyclists shop at, work at, or live near these retail establishments. These commercial areas need continuous sidewalks that are wide enough for pedestrians to feel comfortable, along with safe and frequent crossings for people walking. In these areas, the focus should be on connections between key destinations, especially schools, grocery stores, and areas of high employment and housing. Continuous sidewalks along Kirkwood Road are important in order to safely connect the Meacham Park neighborhood to schools, shopping, transit, and parks.

#### 3. Suburban residential:

The City of Kirkwood includes neighborhoods that were developed for cars as the main form of transportation. These neighborhoods



Residents walking in Kirkwood.



Bike St. Louis in Kirkwood is one of three bicycle routes in the city.

**Figure 2: Means of Transportation to Work (ACS 2012)**

	Kirkwood		St. Louis County	
	Count	Percent	Count	Percent
Drive Alone	9,797	85.2%	397,729	84.0%
Carpool	732	4.8%	30,848	6.5%
Public Transportation	164	1.2%	11,468	2.4%
Bicycle	63	0.1%	1,037	0.2%
Walk	211	1.5%	7,582	1.6%
Taxicab, other	14	0.6%	3,751	0.6%
Work at Home	785	6.8%	20,853	4.4%
<b>Total</b>	<b>11,758</b>	<b>100.0%</b>	<b>473,268</b>	<b>100.0%</b>

tend to have low-traffic streets, often laid out in curvilinear fashion, with cul-de-sacs and low sidewalk coverage. These streets can be pleasant for walking and biking, when they have low numbers of cars, and the cars travel slowly. The low-traffic residential streets are connected by collector and arterial streets, that can feel dangerous for people walking and biking. The high speeds of cars and infrequent crossings on arterial roads can dissuade people from walking or biking.

During the public outreach process, residents in these neighborhoods talked about wanting to walk and bike, but cited lack of sidewalks, and needing to cross busy streets as the main barrier. For example, crossing I-270 at Big Bend Boulevard is unpleasant and feels dangerous for many residents west of I-270. Making sure that arterials and collectors have sidewalks and safe and frequent crossing opportunities is of primary importance to helping residents in suburban residential areas walk and bicycle.

Streets that connect through neighborhoods, rather than end in cul-de-sacs should be considered for sidewalks as well. The narrow streets in these neighborhoods means building sidewalks can involve difficult tradeoffs of either expanding roadways, or not providing safe walking access. On some residential streets traffic calming or traffic diversion can also help slow car traffic, creating safer streets for all users.

### Connectivity

The street connectivity in Kirkwood, regardless of development pattern, is interrupted by large arterials that form barriers, as they have few safe crossings. Likewise, the railroads also form barriers, as there are few official crossings. Throughout the public outreach process, residents noted that the rails are difficult to cross on bike or using a stroller or wheelchair. In areas where there are fewer pedestrian and bicycle connections, it becomes even more important to ensure that the connections are safe and welcoming to all users.

### Getting to work

The commuting patterns of Kirkwood residents largely resemble those of St. Louis County overall (Figure 2). The majority of commuters (85.2%) drive alone. However, residents of Kirkwood are more likely to work at home, but less likely to take public transportation.

Kirkwood has a significant potential to increase biking and walking commuting as 22.2% of residents work within Kirkwood, according to the 2012 American Community Survey (ACS). While ACS data does not track how far people live from their places of work, it is reasonable to assume that some of the residents that work within Kirkwood live within bicycling (3 miles) or even walking (1 mile) distance of their place of work, given Kirkwood's size.

Encouraging residents of Kirkwood who work in Kirkwood to walk or bike can improve transportation in the following ways:

- A small reduction in driving can reduce peak hour congestion - during the recession in 2008, congestion dropped 30% in the nation's 100 most congested areas. Meanwhile, vehicle miles traveled in those areas dropped by only 3.7.<sup>1</sup>

- Walking and biking to work can reduce the demand for parking at workplaces. The average annual cost of a space in a surface parking lot can range from \$430 in a suburban setting to \$2,000 in a central business district.<sup>2</sup>

The 2013 ACS found 1 in 5 workers living in Kirkwood also work in Kirkwood, suggesting there is the potential to shift some work trips during peak hours. But based on the 2009 National Household Transportation Survey (NHTS), less than 1 in 5 trips is work-related for American households. The most promising way to increase biking and walking is to focus on short trips, including trips to schools, parks, stores, and local institutions.

### Getting to school

Kirkwood has excellent, and centrally located, public and private schools. In Kirkwood, 28.7% of households have children under 18. For many students, schools are within walking or bicycling distance.

Some residents are concerned that gaps in the sidewalk network make walking to school unsafe or uncomfortable for children. Safe, high quality infrastructure is key in getting students walking and biking and to reduce congestion. Encouragement and education campaigns can only work when safe and comfortable walking and biking routes exist.

During the public outreach process, safe access to the middle schools was frequently mentioned. The Meacham Park neighborhood is not served by a continuous sidewalk route to Nipher Middle School. Currently, many students walk along Fillmore, as Kirkwood Road does not have a continuous sidewalk on the east side from Big Bend to the railroad tracks. The Fillmore and Big Bend crossing could be improved for pedestrians. A bigger obstacle for students is the unprotected railroad crossing at Fillmore. It is vital to provide a safe and continuous route for students, and all residents, with an accessible and official railroad crossing.

Manchester Road makes pedestrian access to North Kirkwood Middle School difficult. Both students and parents reported that compliance at the pedestrian crossing near the school is low. A full signal, or a High-intensity Activated crossWalk (HAWK) beacon, could help students and other residents cross Manchester Road safely. Crossing Kirkwood Road is also a barrier for students that live east of the arterial. Improved crossings are an option for helping students get to school.



*Not all suburban residential neighborhoods have sidewalks.*

### Getting to stores, restaurants, and community institutions:

The high quality and density of shopping districts and local businesses are a unique and vital resource in Kirkwood. Many households are within easy walking distance of shops, banks, schools, parks, and transit. When residents choose to walk and bike rather than drive to these destinations, it reduces parking demand and decreases car congestion within commercial districts.

Encouraging walking and biking to local destinations is gaining attention as an economic development strategy, for several reasons:

- Stores can attract additional walking customers without adding parking. Adding bicycle parking is less costly and requires less space than adding car parking.
- People who walk and bike to stores tend to make more frequent trips, resulting in

1. INRIX. INRIX National Traffic Scorecard Reveals Startling 30 Percent Decrease in Traffic Congestion in 2008. INRIX.

2. Litman, Todd. Transportation Cost and Benefit Analysis: Techniques, Estimates, and Implications. Rep. Victoria Transport Institute, 28 Aug. 2013. Web. 14 Aug. 2014. 5.4-10



*Parks are a popular destination for residents in Kirkwood.*



*Grant's Trail is a regional asset and a key recreational destination for Kirkwood residents.*



*Sidewalks on Holmes connects Grant's Trail to the rest of Kirkwood.*

- increased monthly spending.<sup>3</sup>
- Encouraging walking and biking to stores and restaurants is another way to promote buying local, as people tend to make shorter trips when walking and biking.

### Getting to the park

Access to Kirkwood Park was brought up by residents during the public engagement period; several expressed concern with the lack of sidewalks along Adams. The railroad crossing at South Geyer was also seen as a barrier for residents south of the park. Several residents felt that South Geyer was not safe for bicycling, especially with children. While there is a continuous sidewalk along one side of South Geyer, several residents felt it was difficult to cross the street to access the sidewalk. Both Emmenegger Park and Powder Valley Conservation Center are served by roads with narrow or nonexistent shoulders. The narrow right-of-way along these roads precludes many facility types. The narrow lanes and slower design speed of the road within Powder Valley Conservation Center is an example of a possible design that would improve non-motorized access without expanding the roadway.

Access to Grant's Trail, owned by The Great Rivers Greenway, was one of the most frequently cited issues for residents throughout the public process. Holmes Ave, the point of access to the Kirkwood trailhead, was recently

<sup>3</sup> Clifton, Kelly J. "Business Cycles: Catering to the Business Market." Transportation Research News May 2012: n. pag. Transportation Research Bureau. Transportation Research Bureau. Web. 12 Nov. 2013.

repaired and has an ADA compliant sidewalk. However there are no bicycle lanes and many residents expressed concern the railroad tracks were difficult to cross by bicycle. Any proposed treatment must be a collaboration between the town of Oakland and Kirkwood, as the maintenance of the street is split between the two municipalities.

### Getting everywhere else

For some residents, walking and biking is not a matter of choice, but necessity. The 2012 ACS estimated that 5.3% of Kirkwood households had no access to vehicles. These households depend on walking and biking infrastructure in order to reach necessities, like food, jobs, schools, and transit, not to mention recreation.

### Summary of biking conditions

#### *Current facilities:*

- Every street in Kirkwood outside of I-270 and I-44 can be counted as a bicycle facility, as bicycles are vehicles under Missouri law.
- Two greenways owned by The Great Rivers Greenway, Grant's Trail and Meramec Greenway, provide lower stress routes for bicyclists.
- There are three designated bicycle routes, marked by signage and wayfinding, including Bike St. Louis in Kirkwood.
- There is a bicycle lane on West Rose Hill Ave. between Couch Ave. and South Geyer Rd.

*Opportunities:*

- Kirkwood residents are engaged in the community and support more opportunities for safe bicycling.
- Many streets are already well designed for bicycling, and some have wayfinding signs to help navigate routes.

▪ Kirkwood is connected to neighboring communities through the Great Rivers Greenway network, and Saint Louis County is planning on placing bike lanes on Adams from Kirkwood to Webster Groves, through Glendale.

*Challenges:*

- There are meaningful destinations within biking distance, including schools and shops.
- Challenges:*
- Narrow right of way, as many streets were not planned with walking, biking, and driving in mind.

▪ Major arterials owned by MODOT and Saint Louis County are perceived by some residents as barriers to safe walking and biking.

- The gaps in the pavement at the train tracks cause challenges for some people walking, bicycling, or using wheeled devices.

**Summary of walking conditions**

*Current facilities:*

- There are nearby greenways, including Meramec Greenway and Grant's Trail;

Grant's Trail is connected to the city center with continuous sidewalks.

- Existing sidewalk network is strongest in the city center; newer neighborhoods are more likely to lack sidewalks or have a discontinuous network.

▪ Kirkwood has several enhanced crosswalks including decorative crosswalks in the central business district and high visibility crosswalks at some crossings; some residents reported motorist compliance issues at the pedestrian crossings along Geyer and across Manchester at the North Middle School

- The train tracks partially interrupt the street grid; several of the existing crossings are in poor condition and are difficult for residents with wheelchairs or strollers.

*Opportunities:*

▪ Kirkwood residents are physically active and engaged in their community; throughout the outreach process, residents talked about choosing to live in Kirkwood because of its active lifestyle.

- The strong downtown business district and train station gives residents and tourists meaningful destinations for walking trips.

▪ The historic residential and commercial districts have connected street grids.

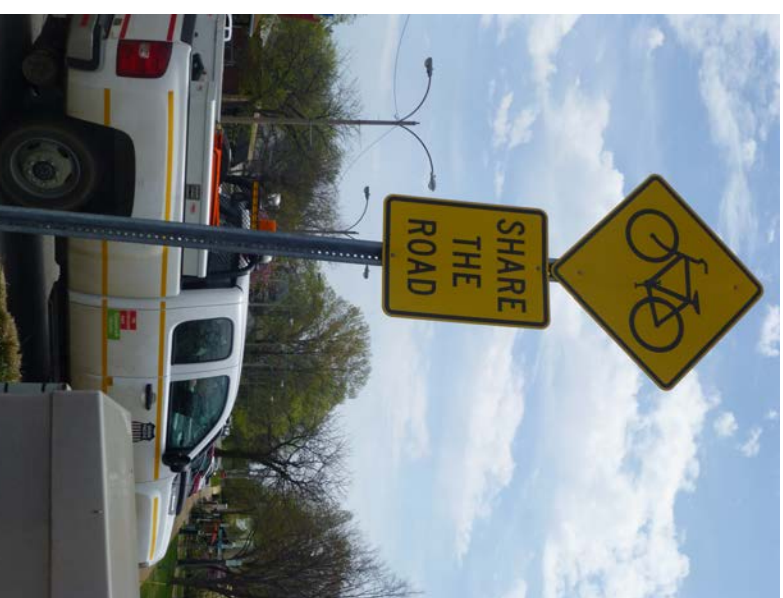
- The parks, green space, and greenways in Kirkwood have great trails for walking.

*Challenges:*

- Sidewalk infill requires significant investment, will increase impervious surfaces and impact stormwater runoff, and may require removal of trees.

▪ The railroad tracks are a barrier to connecting streets.

- Many streets have a limited paved area and right-of-way, constraining the options for additional infrastructure.



*The City of Kirkwood has Shared The Road signs on bicycle routes.*

## Safer People, Safer Streets:

Summary of U.S. Department of Transportation Action Plan to Increase Walking and Biking and Reduce Pedestrian and Bicyclist Fatalities

September 2014



*The Department of Transportation has been increasing their focus on pedestrian and bicycle safety in the last several years.*

## Review Of Existing Plans and Policies

### FEDERAL POLICY

In March of 2010 the US Department of Transportation (DOT) signed the Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations. The principle goal of this policy, is to “incorporate safe and convenient walking and bicycling facilities into transportation projects.” Recommended actions most relevant to this plan are:

- Considering biking and walking equal to other modes of transportation when designing and updating infrastructure
- Ensuring transportation options for people of all ages and abilities
- Making biking and walking part of doing business for the agency, by collecting data on biking and walking, performing regular maintenance on biking and walking facilities, and setting mode share targets.

The DOT also recommends going beyond minimum design standards to ensure that facilities are safe, comfortable, and able to accommodate increased demand. In August of 2013, the DOT showed its commitment to exceeding standards by endorsing two design guidebooks that recommend higher standards for biking and walking: the National Association of City Transportation Officials’ (NACTO) Urban

Bikeway Design Guide and the Institute of Transportation Engineers’ Designing Walkable Urban Thoroughfares: A Context Sensitive Approach.

In this century, the DOT has shown a steady move towards higher level of design standards for biking and walking. In the context of this plan, it is prudent to assume the trend will continue, and strive for design solutions that will match DOT policy now and in the near future.

### STATE POLICY

In 2011, the State of Missouri adopted a Complete Streets resolution. Accordingly, the Missouri Department of Transportation (MoDOT) actively works to incorporate bicycle and pedestrian facilities into projects. Municipalities can partner with MoDOT to improve biking and walking access during routine maintenance of MoDOT facilities by showing demand and a plan to enhance connectivity for biking and walking throughout the community. MoDOT operates the following surface streets within Kirkwood:

- Manchester Rd (100)
- N Kirkwood Rd/ Lindbergh Rd (61/67)

Additionally, MoDOT operates I-44 and I-270, which are both partially within the boundaries of the City, but are separated highways for motor vehicles only.

In 2013, MoDOT updated their long range transportation plan, *MoDOT on the Move*. Two

of the four goals in this plan are directly related to walking and biking transportation:

- Keep all travelers safe, no matter the mode of transportation
- Give Missourians better transportation choices

In support of these goals, the plan states that road projects are evaluated for demand and need, and bicycling and walking facilities are integrated into projects when needed.

Specific treatments mentioned are upgrading signs, signals, lighting, and sidewalks or bicycle lanes.

The plan focuses on the financial implications of the decline in demand for car travel, and the concomitant increase in demand for passenger rail, transit, walking and bicycling. The plan underlines the growing popularity of the Missouri River Runner, the state-supported train route that serves Kirkwood.

## REGIONAL

### **Moving Transit Forward,** Bi-State Development Agency (MetroTransit)

In the next 5 to 10 years, there are no foreseeable major transit projects in the planning area. MetroTransit's long range plan mentions two potential major routes in the study area: Bus Rapid Transit along the I-44 corridor and Commuter Rail along the existing passenger rail line that goes through

Kirkwood. Neither of these proposed routes include information on stops, but they would potentially improve transit access to Kirkwood.

MetroTransit is concluding a feasibility study for the first phase of rapid transit, and I-44 was not included as a recommendation. Commuter rail is dependent on state and federal level policies.

### **Transportation Improvement Plan 2015 - 2018,**

East West Gateway Council of Governments

The only scheduled and funded project in the study area that may impact walking and biking is the scheduled rehabilitation of the Big Bend Road Bridge at I-270. The funding indicates the bulk of the preliminary engineering and construction will take place in 2017. This plan can help to recommend the bicycle and pedestrian accommodations on the rehabilitated bridge.

### **Regional Transportation Plan: 2040,** East West Gateway Council of Governments

The only major project in the regional long range transportation plan is replacing the I-44 bridges over the Meramec River in 2021-2030. A new bridge could create opportunities to connect Kirkwood to parks in Fenton and Sunset Hills. East West Gateway Council of Governments is updating the regional long range plan at the time this plan was written.

FEBRUARY 2014  
A Vision for  
Missouri's  
Transportation  
Future



*One of the priorities in MoDOT's most recent long range plan is expanding transportation choice.*

**Figure 3: Proposed on-street bicycle facilities in the Gateway Plan**

Infrastructure	Roads
Bike Lanes	Manchester (city limits to city limits) Geyer (Argonne to Adams)
Paved Shoulders	Kirkwood (Big Bend to 1-44) Geyer (Balmagoun Ln. to north city limits of Kirkwood)
Shared Lane Markings (Sharrows)	Kirkwood (Big Bend to Manchester) Holmes (Adams to Grant's Trail / Leffingwell) Woodlawn (Adams to city limits) Geyer (Adams to Manchester) Geyer (Argonne to Balmagoun Ln.) Woodbine (Kirkwood to Craig) Craig (Woodbine to Big Bend)
Share The Road Signage	Dougherty Ferry (Ballas to Geyer) Geyer (Manchester to city limits)
Wide outside	Adams (Dougherty Ferry to Woodlawn) Craig (Big Bend to city limits)
Needs further study	Big Bend (Geyer to city limits) Adams (Woodlawn to Holmes)



**Gateway Bike Plan,**  
The Great Rivers Greenway District

The Gateway Bike Plan focuses on connecting the region through bike routes. The emphasis is on supplementing existing multi-use paths and future paths planned by Great Rivers Greenway, the regional recreation tax district.

*Multi-use paths:*

There are two trailheads in Kirkwood, Grant's Trail and the Meramec Greenway. There are no current plans to extend either trail.

*On-street network:*

The recommended routes provide intra-regional connectivity for Kirkwood residents. Most of the recommended on-street facilities are shared-use facilities. See Figure 3 for a list of proposed facilities. The current plan will supplement the recommended Gateway Bike Plan routes with an emphasis on neighborhood routes and inter-connectivity for residents. National bicycle design guidelines from the American Association of State Highway Officials (AASHTO) have been updated since the Gateway Bike Plan was drafted. The current plan incorporates the facility types in these updated guidelines to provide for riders of all ages and abilities.

**COUNTY**

**St. Louis County Bicycle Facilities Plan,**  
Saint Louis County Highways and Traffic

The St. Louis County Bicycle Facilities Plan

applies to the following roads in the study area that are maintained by St. Louis County:

- Ballas Rd.
- E. Adams Ave.
- Big Bend Blvd.
- Marshall Rd.

The Bicycle Facilities Plan sets design guidance for experienced commuter cyclists. The Bicycle Facilities Plan allows for wide outside lanes (13' to 15') or bike lanes to be used as bicycle facilities. Arterial and major collector roads with a minimum 14' wide outside lanes can be signed with Bike Route signs following the standard design in the Manual on Uniform Traffic Control Devices (MUTCD), the document which describes the standards for traffic signs, road markings, and signals. Roads with speeds over 35 mph are not recommended for shared travel.

St. Louis County has also recently created a Road Diet Policy that sets guidelines for when streets can be considered for a reduction in lanes in order to make space for bike lanes. St. Louis County continues to update its policies in order to implement Complete Streets.

**KIRKWOOD**

**Kirkwood Vision 2015**

The long term vision for the City of Kirkwood is set by Vision 2015 and its subsequent 3 year update, which is set to be updated in the coming years. The Pedestrian and Bicycle Plan will support the goals pertaining to improved

walkability and walking infrastructure, and bicycle trails and infrastructure. Pedestrian and bicycle improvements can also support the goals pertaining to increased downtown vibrancy and accommodate a range of socio-economic needs. Vision 2015 contains an appendix titled, “Downtown Urban Design Plan,” that has an appendix focused on transportation in the city center titled “Downtown Transportation Plan.”

### **Appendix 1: Downtown Transportation Plan**

The appendix assesses existing conditions and projects future traffic flow. The bulk of the appendix is devoted to creating streets that support pedestrian traffic and vibrant commercial areas. The plan underscores the possibility for increased livability, urban redevelopment, and crime prevention through traffic calming. Potential controversy, especially with speed tables and vertical calming, is also addressed.

Based on studies of other communities, five treatments are recommended, along with warrants and project selection procedures. The following treatments are recommended for downtown Kirkwood:

- Mid-block median
- Neckdowns
- Raised crosswalks
- Textured Pavement Treatments
- Roadway striping (lane diets)
- Coordinated traffic signals

The recommended treatments have been used around the country with documented success and popularity. The plan provides detailed information on programs in Boulder and Portland and their successes.

### **KIRKWOOD CITY CODE**

#### **Walking**

Based on Chapter 20, Section 2, Subdivision A, property owners are required to maintain the sidewalks in front of their premises, including if the sidewalk becomes hazardous due to lack of maintenance. The City of Kirkwood can repair the sidewalk if the property owner fails to do so after receiving proper notice. The property owner will be billed for the work in this case.

The code allows for the City of Kirkwood to address hazardous sidewalks efficiently. It also places the liability of sidewalks firmly on residents. Sidewalk cost-sharing programs can build support for sidewalks and maintenance among residents.

#### **Biking**

The Kirkwood City Code includes an entire section devoted to bicycles, Chapter 4.1/2. The Code differs from Missouri State Law in two ways:

- The requirements for retroreflective material on the pedals and wheels of a bicycle are much more specific than those of the Missouri State Statutes. Currently the

Kirkwood City Code requires reflectors on both sides of the pedals in addition to reflectors on both the rims and spokes of both sides of bicycle tires (Section 4.1/2 - 3 P. 4).

- The City Code requires bicyclists to use paths adjacent to streets or highways when they have been officially designated (4.1/2 - 5).

The City of Kirkwood also has three designated bike routes, which are currently shared facilities marked by signage. These routes have been considered as part of the planning process for the City of Kirkwood, and are incorporated into the proposed alternatives within the plan.

## Plan Priorities and Parameters

The priorities and parameters of the plan provide the structure and aim of the plan. The priorities were created with the Planning Advisory Committee and the City Staff, to ensure the priorities fit residents' needs, while staying within City resources (see Appendix B).

The Kirkwood Pedestrian and Bicycle Master Plan encompasses a 15 year planning horizon. Recommendations take into account parameters set by the City of Kirkwood for staff time and budget. The planning priorities are:

- Safely connecting schools, businesses, and parks
- Traffic calming infrastructure that supports walking, biking and accessibility for people of all ages and abilities
- Education and promotion of walking, biking, and greenspace in Kirkwood
- Financial responsibility and consideration of multiple funding sources

The priorities guided the selection and prioritization of recommendations in the plan. The following recommendations on education, enforcement, and encouragement were based on the third and fourth priorities. The first, second, and fourth priorities formed the basis of the prioritization process for the walking and biking infrastructure recommendations.

## Education

Education on traffic law and safety helps residents of all ages share the road, whether they are biking, walking, or driving. For people interested in bicycling, education on best commuting routes or on-road cycling can help them make bicycling a habit. For pedestrians, it is important to understand how to walk safely, including children walking to and from school.

### RECOMMENDED PROGRAMS

#### Safety literature for all roadway users

In order to share the roads safely, pedestrians, cyclists and drivers must understand the laws and statutes at the local and state level. Distributing safety literature at civic buildings, recreational centers, local shops, or even as a law enforcement warning, helps the public learn about traffic laws in a cost-effective way. Safety literature should be easy to read, concise, and visually appealing in order to reach the widest audience possible.

The City can also increase awareness of bicycle safety by sharing online education, such as the League of Illinois Bicyclist's Bike Safety Quiz (<http://www.bikesafetyquiz.com/>).

Bicycle and Pedestrian Safety Brochures can be ordered free-of-charge from MODOT: <https://www4.modot.mo.gov/OrderSystem/pub/display/Order.do>

Trailnet distributes "Rules of the road" cards for bicyclists. Packs of cards can be picked up at the



*The planning priorities were guided by public outreach and the Planning Advisory Committee*

Trailnet office, 411 N 10th Street, St. Louis.

*Online Resources:*

- Missouri Bicycle Federation: <http://mobikefed.org/content/missouris-bicycle-and-pedestrian-laws>
- Trailnet: <http://trailnet.org/2014/07/31/missouri-bicycle-laws/>
- RAGBRAI Ride Right Coloring Book: <http://ragbrai.com/wp-content/uploads/2009/09/RideRightBook2013.pdf>

### Education in schools

It is important to encourage children to walk and bike to school safely and educate parents, school district staff on the benefits of walking and bicycling to school. Biking and walking education in schools is the most effective way to teach children how to use the roads safely. In Kirkwood, as many children live within walking and bicycling distance to school, education will help students to improve their own safety and get exercise.

Keyzor Elementary School in Kirkwood has worked with Trailnet since 2012 to host Keyzor Bike Week. During a week in October all of the students at Keyzor Elementary School take part in bicycle safety classes with trained bicycle safety instructors and Kirkwood Police Officers. In 2014, Bike Week culminated in a community ride with Mayor McDonnell.

Bike Week is popular with students, parents, and teachers, as it helps students to ride safely,

while encouraging physical activity. Bike Week should be expanded to all elementary schools in the Kirkwood School District.

Lessons incorporated into the classroom will reach all students. These lessons can also be effective at reaching parents, who are the ones driving to and near schools. Typically, biking and walking education is incorporated into Physical Education courses. Several model curricula are available online through the Safe Routes to School National Partnership (<http://www.saferoutespartnership.org/state/bestpractices/curriculum>).

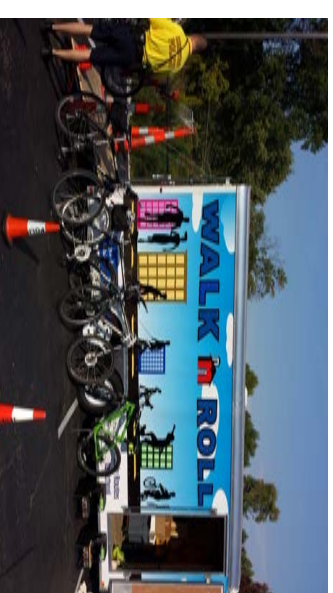
The national Safe Routes to School program is a major resource for biking and walking programming in schools. It was founded to educate children on safety and to encourage families to incorporate physical activity into their daily routines. Programs that help children to walk and bike safely include Walking School Buses, Bike Trains, Bicycle Rodeos, National Walk to School Day, and Safe Routes to School walking maps.

*Online Resources:*

- Trailnet's Safe Routes to School Program: <http://trailnet.org/programs/safe-routes-to-school>
- Safe Routes to School National Partnership: <http://www.saferoutespartnership.org/>
- National Center for Safe Routes to School: <http://www.saferoutesinfo.org/>
- FHWA Safe Routes to School: <http://safety.fhwa.dot.gov/saferoutes/>



*Bike Week at Keyzor Elementary School helps students learn how to ride safely.*



*Kirkwood Police officers help teach bicycle safety to Keyzor Elementary students.*



*Bicycle education courses teach safe riding skills and basic mechanics.*

## Bicycle education classes

It is important to encourage safe and confident biking by providing education to residents in Kirkwood. Though most adults know how to drive a car, they have never learned the rules of the road in terms of biking. The proper knowledge and skills make biking safer, more relaxed, and more enjoyable.

Bicycle education courses can be organized through the City or through community organizations, such as churches. In addition to the fee for hiring an instructor, a bicycle education course typically requires meeting space for 3 hours and access to an empty parking lot. Locally, Trainet offers a 3 hour hands-on class on how to ride as visibly, predictably, and safely as possible.

There are several trained bicycle safety instructors in St. Louis. It is also possible for a Kirkwood staff person to become a trained instructor by attending a three day workshop. Workshops are periodically held in St. Louis. League Certified Instructors can be found here: <https://www.bikelleague.org/bfa/search/map?bfaq=>

### *Online Resources:*

- Trainet's Bikesmart: <http://trainet.org/events/bike-smart>

## Enforcement

Enforcement programs foster safe and lawful behaviors of all roadway users. Enforcement programs often focus on reducing crashes and conflicts between motorists and cyclists and/or pedestrians. Common themes are:

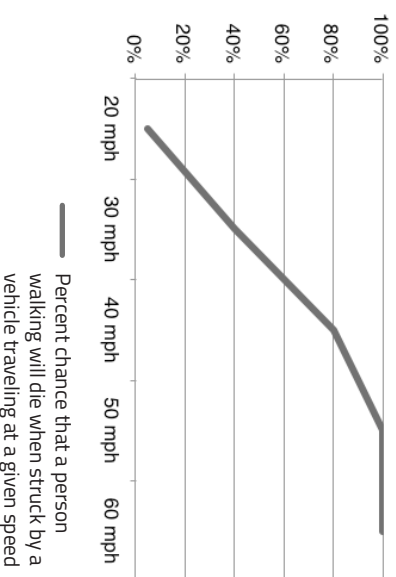
- Speed limit enforcement programs
- Distribution of local and state bicycle and pedestrian laws
- Raising awareness of the rights and responsibilities of all road users

Research shows that the higher the speed, the more severe the crash will be when a vehicle collides with a pedestrian or bicycle (See Figure 4). With effective enforcement, motorists tend to stop speeding, creating a safer environment for all roadway users.

Law enforcement officers are the only ones who can enforce laws for bicyclists, pedestrians, and motorists to improve safety. They also come in contact with all roadway users on a daily basis. This puts law enforcement officers in a unique position to assist with and add credibility to community efforts to encourage bicycling and walking and improve safety.

Enforcement programs can be very effective in changing roadway behaviors, but can be seen as unpopular with the public. Efforts that involve education first, such as distribution of safety information instead of tickets, or

**Figure 4:**  
**Vehicle speed and death in pedestrian crashes**



speed radar trailers, should be a part of any enforcement program or campaign.

**Recommended programs**

*Positive Tickets*

Officers can reinforce good behavior and reward people for doing the right thing by giving them positive tickets (See Figure 5). Officers can reward people walking, bicycling, and driving with such tickets. Frequently, positive tickets can be exchanged for a small incentive at a local retailer. As part of the planning process, positive tickets will be designed and distributed to Kirkwood Police. Increased Publicity of the Targeted Enforcement Program.

*School Zone Enforcement*

Targeting speeding motorists in school zones would help create a safer environment for school children. Strict enforcement of the 20 MPH zone is recommended. Targeted enforcement and education efforts can also include motorists that fail to yield at crosswalks.

*Law Officer Training*

It is important for law enforcement officers to be trained on pedestrian and bicycle laws and rules in order to properly enforce the laws. Officers play a critical role in assuring all roadway users obey laws. This will prevent crashes and create safer roadways for all users. All Missouri law enforcement officers should be familiar with the rules as to enforce them lawfully.

**Resources**

- State of Missouri Statutes, including traffic rules for motorists, bicyclists, and pedestrians: <http://www.moga.mo.gov/statutes/C300.HTM>
- Pedestrian Safety Training for Law Enforcement: [http://www.nhtsa.gov/Driving+Safety/Pedestrians/Pedestrian+Safety+Training+for+Law+Enforcement+\(CD-ROM\)](http://www.nhtsa.gov/Driving+Safety/Pedestrians/Pedestrian+Safety+Training+for+Law+Enforcement+(CD-ROM))
- Bicycle Safety Training for Law Enforcement: <http://www.nhtsa.gov/Driving+Safety/Bicycles/Enhancing+Bicycle+Safety:+Law+Enforcement+s+Role>

Figure 5: A sample positive ticket



Name: \_\_\_\_\_

Awarded for: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date: \_\_\_\_\_

Awarded by Officer \_\_\_\_\_



Officers on bicycles can easily interact with residents. Photo source: [www.pedbikeimages.org/](http://www.pedbikeimages.org/)



*Community walks and rides can foster community and encourage activity.*

## Encouragement

Encouragement allows residents to share in the joy of biking and walking. Creating a safe and positive environment for residents to try out active transportation is a powerful tool in becoming more bikeable and walkable. The following programs are recommendations based on the responses in the community survey, along with national best practices for encouraging walking and biking.

### RECOMMENDED PROGRAMS

#### Active transportation rewards programs

Working with local businesses to offer rewards for those who arrive on foot or by bike can be a great way to promote local businesses and active transportation. Bicycling incentives are common in communities throughout the country. For example, businesses can reward those who have a helmet to show they biked. As it's more difficult to prove that a customer arrived on foot, walking incentives are more rare. A few ways to incentivize walking and biking to local retail include:

- Retailers offer specific rewards to those who arrive by bicycle. Usually, the incentive is small, like a 5% discount at a restaurant, or a free upgrade on drink size at a café. For example, in the Central West End, Café Ventana offers a belignet to customers with a helmet. Individual retailers can opt to offer bicycle incentives and choose to promote them on their own, or work with other businesses.



*Downtown events can help get people out walking.*

- Retailers coordinate to offer rewards on a specific day. The Bike Saturdays program in Long Beach, California, is an example of coordination among businesses and the City to promote local shops and restaurants, while encouraging people to bicycle, and reduce parking demand. Participating businesses put a sticker on their windows, and receive recognition on the City's website. In return, they agree to offer discounts or incentives, like a free soft drink at a restaurant, to cyclists on Saturdays. A similar program could encourage residents to try bicycling, and it can also encourage them to explore local businesses.

- Work with local businesses to encourage them to become certified Bicycle Friendly Businesses through the League of American Bicyclists. This program will help them identify ways to better serve cyclists, including by providing bicycle parking, or places for cyclists to store their helmets.

#### Community walks and rides

Community rides and walks encourage residents to be active and get to know each other in a friendly and supportive environment. Community rides or walks help residents to discover the joy of being active and help strengthen community. Events have designated routes, typically loops, which end at the starting place. The pace should be accessible for all participants. Organizing a community ride or walk is a great way to get volunteers involved in promoting walking and biking, while building community support.

Community rides can also be an opportunity for partnership. The Alpine Shop in Kirkwood hosts rides out of their shop. Trainet has also worked with Kirkwood to host rides.

### Walking and biking maps

Being able to safely get around the city will help encourage more people to bike and walk. The creation of a walking and biking transportation map will help residents understand the best routes and how to access city destinations such as schools, library, and the business district by walking, biking, or taking transit. As part of the planning process, walking and biking maps will be created.

### National Bike Month activities

National Bike Month is in May. The City can encourage residents and employees of all ages to bike in and around Kirkwood for transportation and recreational purposes during National Bike Month. Kirkwood can participate in National Bike To Work Day, by working with a local café that is interested in hosting a Bike To Work Day Station.

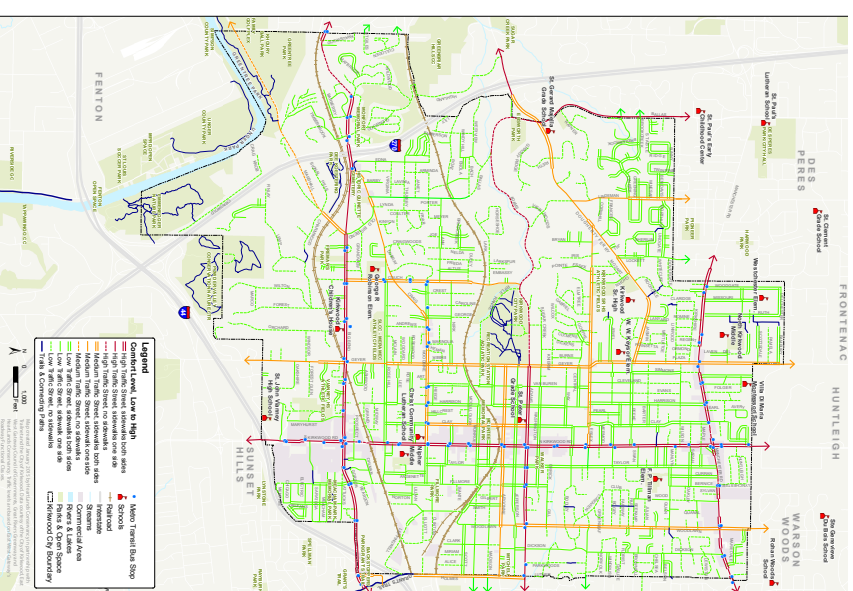
Other common events include family group rides, adult and children cycling classes, and bike-to-school days. The League of American Bicyclists has a number of valuable online resources to help make local efforts successful, including an event organizing handbook, a calendar linking to local events and activities, and tips for people interested in commuting to work.

### Resources

- Live Well Ferguson has several examples of successful events: <http://livewellferguson.com/main/>
- Walkinginfo.org has several ideas for promoting walking, including examples of successful programs: <http://www.walkinginfo.org/promote/strategies.cf>
- Trainet Bike to Work Day resources: <http://trainet.org/work/bicycling/bike-work-day-month/>
- League of American Bicyclists: <http://bike-league.org/content/plan-bike-month-event>



*Bike to Work Day events are already hosted throughout the region.*



*Community walking maps can help people choose new walking routes.*

## Routes and Prioritization

The proposed walking and biking networks are presented in prioritized maps and tables. Prioritization provides a framework for phased implementation, given constrained resources. The prioritization is based on community preferences, feasibility, and impact. The prioritization methods emphasize creating a network for walking and biking to community destinations.

If the opportunity to implement a project arises before the proposed phase, the phasing schedule should not prevent it from being implemented. Recommendations that require restriping should be implemented when roads are scheduled to be repaved and painted. Likewise, shared lane markings should not be added when a street is scheduled to be repaved in the next year. Ultimately, the recommendations should be balanced by the Director of Public Works to ensure coordination with planned maintenance schedules.



*Kirkwood's vibrant downtown offers many walking destinations.*

## Recommended Routes for Walking

The recommended walking route network is designed to provide a comprehensive walking network within Kirkwood, and to enhance walkability. The proposed routes were created based on public comment identifying high priority corridors and destinations. Routes were designed to create a network of walking routes within  $\frac{1}{4}$  mile of residents when possible.

The density and purpose of recommended routes varies with the neighborhood design, as outlined in the Existing Conditions Report. The method behind the recommended routes for each type of development are explained below.

**Traditional town center:** The recommended network bolsters the walking-oriented street design of Kirkwood's traditional town center. The streets are arranged in a grid, and many feature sidewalks. The key focus for these routes is filling in sidewalk gaps in order to bolster the existing walking network. A dense walking network is recommended in order to build upon and expand the current walking-friendly state of the town center. By improving and expanding the dense walking network, more Kirkwood residents will be able to walk to stores, schools, and civic buildings in the town center.

**Suburban residential:** These neighborhoods were designed primarily for transportation in cars, with walking as a recreational activity.

Many neighborhoods are based on a hierarchy of streets, where local streets serve residences and then feed into higher traffic collectors and arterials. Several local streets stop in a dead end or cul-de-sac. The recommended routes on these streets focus on providing as continuous of a network as possible, based on the street pattern. Through streets that lead to parks and schools were prioritized. For local streets without through connections, the most effective way of addressing pedestrian safety is often on an individual basis, as described in the section on traffic calming.

**Suburban commercial:** In the suburban commercial areas, the focus is on providing safe and continuous walking routes to destinations and neighborhoods. The proposed Kirkwood Road road diet is an opportunity to expand the walking-friendly traditional town center to make more commercial destinations easily reachable on foot.

### Walking infrastructure

With one exception, the recommended infrastructure type is a sidewalk. For pedestrian infrastructure, design of facilities is based upon ADA regulation and the right-of-way available. The following sections highlight recommendations that differ from, or go beyond, sidewalk recommendations.

#### Adams Road and Ballas Road

Sidewalks are not possible on Adams Road and Ballas Road in the Sugar Creek area, due to the width of the road. Nevertheless, the Sugar

Creek area is a popular place for walking and biking in Kirkwood. The suggested treatment is to make slightly more room for walking by restriping the driving lanes to 10' the next time Adams is repaved. Driving lane width of 10' is allowed in national roadway design guidelines and research does not show a safety advantage to increased lane width, except for on freeways, where speeds exceed 55 mph.

### **Argonne Drive**

A pedestrian plaza and mid-block crossing should be installed permanently on E Argonne Drive, between the Farmer's Market and the parking lot (the eastern-most cut through). A second pedestrian plaza should be installed at the western-most cut through on W Argonne Drive. At the intersections with Clay Avenue, Kirkwood Road, and Taylor Avenue, the medians should be extended to the crosswalks, and curbs should be installed opposite the medians, to create a pedestrian safety island in the center of the crosswalk.

### **Kirkwood Road**

Currently, Kirkwood Road has two through lanes with on-street parking in Downtown Kirkwood. The thriving stores and pedestrian traffic demonstrate the success of this road design in Downtown Kirkwood. The road diet and on-street parking should be extended north to Washington Avenue and south to Woodbine Avenue in order to enhance pedestrian safety and increase parking for the commercial destinations along Kirkwood Road. After observing results from the initial road diet expansion, the City of Kirkwood should consider the feasibility of expanding the road

diet north to Morningside Drive and south to Rose Hill Avenue, in order to increase safety in residential neighborhoods and improve pedestrian access to Nipher Middle School.

### **Longview Boulevard**

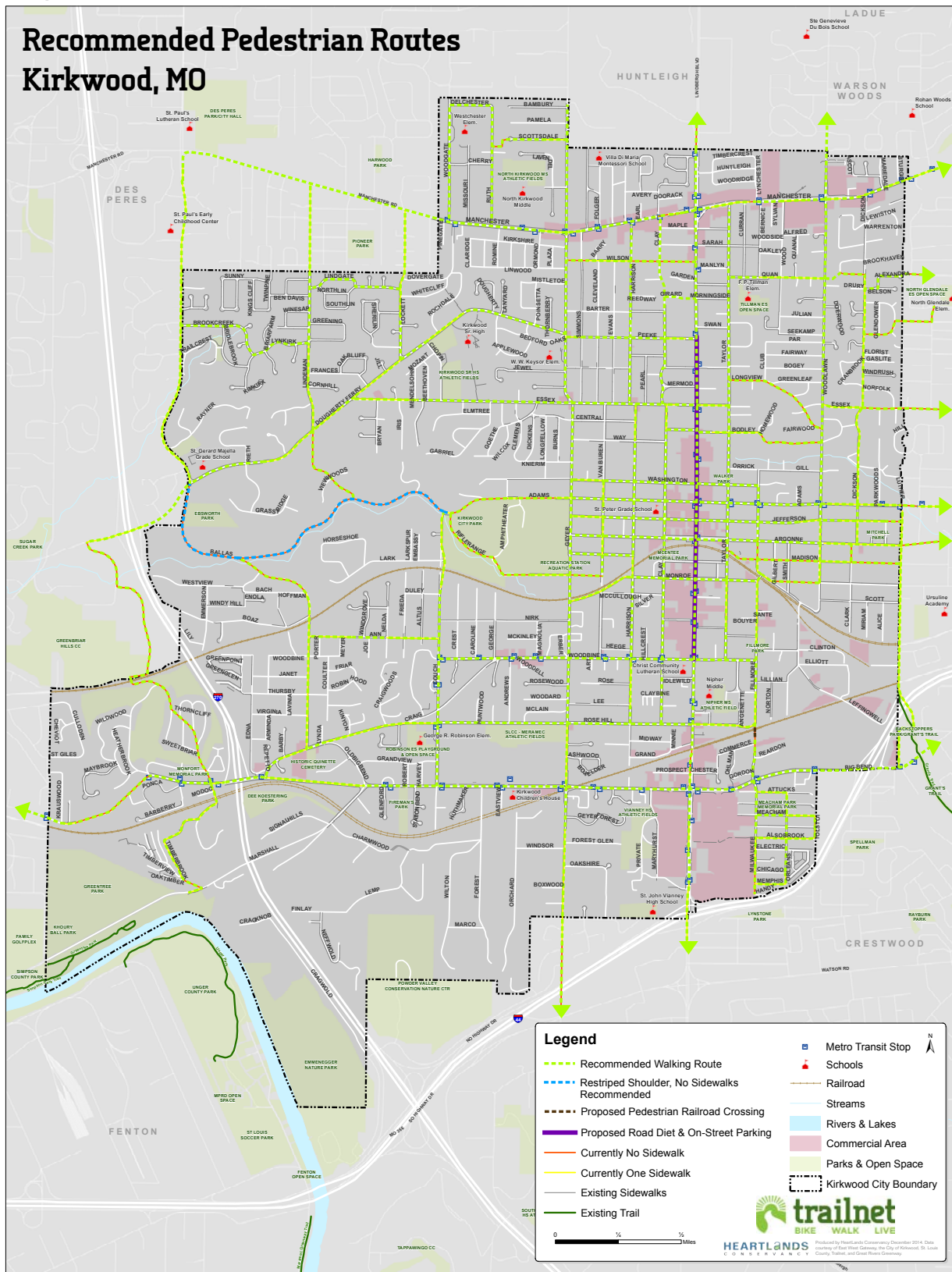
The recommended sidewalk on Longview Boulevard should be placed in the center of the median. This placement will preserve parking, while providing a pleasant and safe walking route. On the section from Club Lane to Taylor Avenue, the curb should be extended in order to create a sidewalk on the north side. The sidewalk will help to calm traffic along this residential street. The medians should be extended to the crosswalks throughout the street, in order to calm traffic and provide pedestrian safety.



*Residents talk with the planning team about recommended improvements on Argonne Drive*

Figure 6.

# Recommended Pedestrian Routes Kirkwood, MO



Recommended routes do not prevent all streets from being used for walking and bicycling



## Pedestrian Prioritization

As Kirkwood has an existing pedestrian network, phasing recommendations are based on identifying high-priority corridors, for which improvements should be targeted. The network of corridors was identified based on neighborhood feedback, destinations, addressing barriers, and ensuring coverage throughout Kirkwood. The corridors were evaluated using criteria based on the community survey, in addition to considerations of feasibility and connectivity (See Appendix A).

Many of the corridors have partial or full sidewalk coverage. The corridors that have full sidewalk coverage are included in the prioritization, as they remain high-priority for intersection improvements. However, these segments do not have any recommended sidewalk projects. See Figure 6 for the full recommended sidewalk network. The priorities are in Figures 10 & 11.

Finally, a railroad crossing at Fillmore is recommended, but not included in the phasing, as any improvements are dependent upon partnership with the railroad company and MODOT. The At Grade Railroad Crossing design summary, (refer to Design Guidelines) provides a summary of considerations for the proposed railroad crossing.

Figure 7: Sidewalk Gaps in recommended network

Streets	Recommendation	Length (mi)	Prioritization
Kirkwood	Sidewalk	0.10	375
Manchester	Sidewalk	0.08	370
Big Bend	Sidewalk	0.35	240
Jefferson	Sidewalk	0.07	205
Fillmore south of railroad tracks	Sidewalk	0.08	195
Fillmore at Madison	Sidewalk	0.07	195
Ballas	Sidewalk	0.32	185
Essex	Sidewalk	0.17	165
Longview	Sidewalk	0.45	150
Clark	Sidewalk	0.07	145
Millwaukee	Sidewalk	0.09	135
Van Buren	Sidewalk	0.13	115
Madison	Sidewalk	0.57	110
Southbrook	Sidewalk	0.10	90
Timberbrook	Sidewalk	0.10	90
Monroe	Sidewalk	0.38	85
Rifle Range	Sidewalk	0.27	85
Bodley	Sidewalk	0.27	80
Brownell	Sidewalk	0.37	60
Wilson	Sidewalk	0.34	55
Lindeman	Sidewalk	0.37	45
Glenwood	Sidewalk	0.59	30
Highland	Sidewalk	0.73	0
<b>Total</b>		<b>6.08</b>	

Figure 8: Streets with one side Sidewalk in recommended network

Streets	Recommendation	Length (mi)	Prioritization
Kirkwood	Sidewalk	0.32	260
Big Bend	Sidewalk	0.51	245
Geyer	Sidewalk	0.61	235
Manchester	Sidewalk	0.64	225
Adams	Sidewalk	0.32	190
Ballas	Sidewalk	2.09	125
Couch	Sidewalk	0.31	115
Dougherty Ferry between Ballas and Geyer	Sidewalk	0.81	105
Dougherty Ferry at I-270	Sidewalk	0.25	105
Rose Hill east of Kirkwood	Sidewalk	0.26	80
Rose Hill at Couch	Sidewalk	0.13	80
Essex at Dougherty Ferry	Sidewalk	0.42	75
Essex east of Woodlawn	Sidewalk	0.16	75
Woodlawn	Sidewalk	0.25	65
Clay	Sidewalk	0.10	60
Craig	Sidewalk	0.34	60
Jefferson	Sidewalk	0.39	60
Peeke	Sidewalk	0.15	60
N Harrison south of Essex	Sidewalk	0.15	55
S Harrison north of Monroe	Sidewalk	0.09	55
S Harrison south of Woodbine	Sidewalk	0.18	55
Madison	Sidewalk	0.13	55
Taylor	Sidewalk	0.19	55
Filmore	Sidewalk	0.44	50
Scott	Sidewalk	0.05	40
Argonne	Sidewalk	0.31	35

Figure 8 cont.: Streets with one side Sidewalk in recommended network

Streets	Recommendation	Length (miles)	Prioritization
Monroe	Sidewalk	0.43	30
Washington	Sidewalk	0.13	30
Meacham	Sidewalk	0.11	25
Memphis	Sidewalk	0.12	25
Orleans north of Memphis	Sidewalk	0.05	25
Orleans south of Attucks	Sidewalk	0.09	25
Van Buren	Sidewalk	0.26	25
Alsobrook	Sidewalk	0.24	20
Attucks	Sidewalk	0.12	20
Bodley	Sidewalk	0.18	20
Milwaukee	Sidewalk	0.14	20
Tolstoi	Sidewalk	0.09	20
Lindeman	Sidewalk	0.70	15
Ann	Sidewalk	0.38	0
Dickson	Sidewalk	0.92	0
Dickson	Sidewalk	0.09	0
Holmes	Sidewalk	1.09	0
Lockett	Sidewalk	0.43	0
Quan	Sidewalk	0.26	0
Scottsdale	Sidewalk	0.09	0
Timberbrook	Sidewalk	0.52	0
Wilson	Sidewalk	0.17	0
	<b>Total: (to add sidewalks to streets)</b>	<b>16.20</b>	
	<b>Total: (for entire recommended)</b>	<b>22.27</b>	

Figure 9: Streets with Sidewalks on both sides in recommended network

Streets	Recommendation	Length (miles)	Prioritization
Geyer	Sidewalk	2.46	235
Geyer	Sidewalk	0.17	235
Kirkwood	Sidewalk	2.38	200
Kirkwood	Sidewalk	0.26	200
Big Bend	Sidewalk	2.48	185
Big Bend	Sidewalk	0.16	185
Manchester	Sidewalk	2.22	165
Adams	Sidewalk	0.99	130
Ballas	Sidewalk	0.09	125
Couch	Sidewalk	0.79	115
Fillmore	Sidewalk	0.34	110
Dougherty Ferry	Sidewalk	0.42	105
Dougherty Ferry	Sidewalk	0.49	105
Dougherty Ferry	Sidewalk	0.24	105
Delchester	Sidewalk	0.17	80
Rose Hill	Sidewalk	1.01	80
Ruth	Sidewalk	0.46	80
Woodgate	Sidewalk	0.45	80
Craig	Sidewalk	0.07	75
Essex	Sidewalk	1.07	75
Woodlawn	Sidewalk	1.47	65
Clay	Sidewalk	1.55	60
Clay	Sidewalk	0.38	60
Jefferson	Sidewalk	0.86	60
Peeke	Sidewalk	0.37	60
Harrison		0.71	55

Figure 9 cont.: Streets with Sidewalks on both sides in recommended network

Streets	Recommendation	Length (miles)	Prioritization
Harrison	Sidewalk	0.86	55
Madison	Sidewalk	0.25	55
Taylor	Sidewalk	1.60	55
Fillmore	Sidewalk	0.43	50
Woodbrine	Sidewalk	1.26	50
Argonne	Sidewalk	1.00	35
Monroe	Sidewalk	0.49	30
Washington	Sidewalk	0.62	30
Meacham	Sidewalk	0.12	25
Orleans	Sidewalk	0.23	25
Van Buren	Sidewalk	0.09	25
Van Buren	Sidewalk	0.03	25
Bodley	Sidewalk	0.18	20
Lindeman	Sidewalk	0.28	15
Alexandra	Sidewalk	0.13	0
Ann	Sidewalk	0.14	0
Belson	Sidewalk	0.05	0
Brookcreek	Sidewalk	0.37	0
Dickson	Sidewalk	0.06	0
Lindgate	Sidewalk	0.38	0
Lockett	Sidewalk	0.17	0
Lynkirk	Sidewalk	0.24	0
Quan	Sidewalk	0.12	0
Scottsdale	Sidewalk	0.14	0
<b>Total:</b>		<b>31.34</b>	

**Figure 10: Existing Connector Paths**

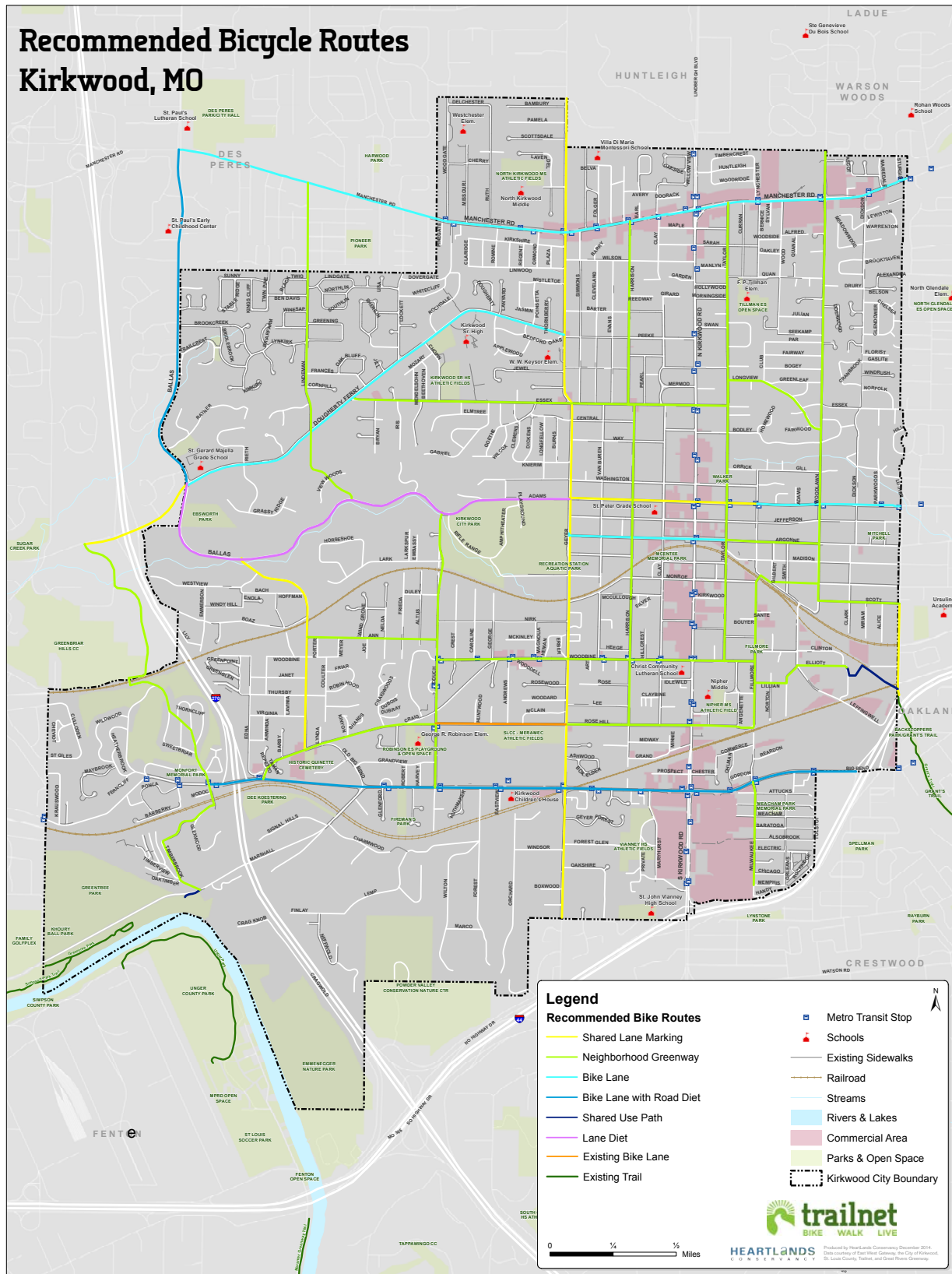
Streets	Recommendation	Length (miles)	Prioritization
Scottsdale Connection	Path	0.09	140
Alexandra	Path	0.02	0
Girard	Path	0.13	0
Quan	Path	0.07	0
<b>Total:</b>		<b>0.30</b>	

**Figure 11: Connections, paths, lane diets and road diets**

Streets	Recommendation	Length (miles)	Prioritization
Fillmore	Ped Rail crossing	0.03	220
Kirkwood	Road diet & on-street parking	1.28	155
Ballas	Restriped shoulder	0.45	125
Adams	Restriped shoulder	1.41	110
Marshall	Merramec Greenway Connection	0.06	65
<b>Total:</b>		<b>3.24</b>	

Figure 12:

# Recommended Bicycle Routes Kirkwood, MO



Recommended routes do not prevent all streets from being used for walking and bicycling.





## Recommendations for Bicycling

### Argonne Drive

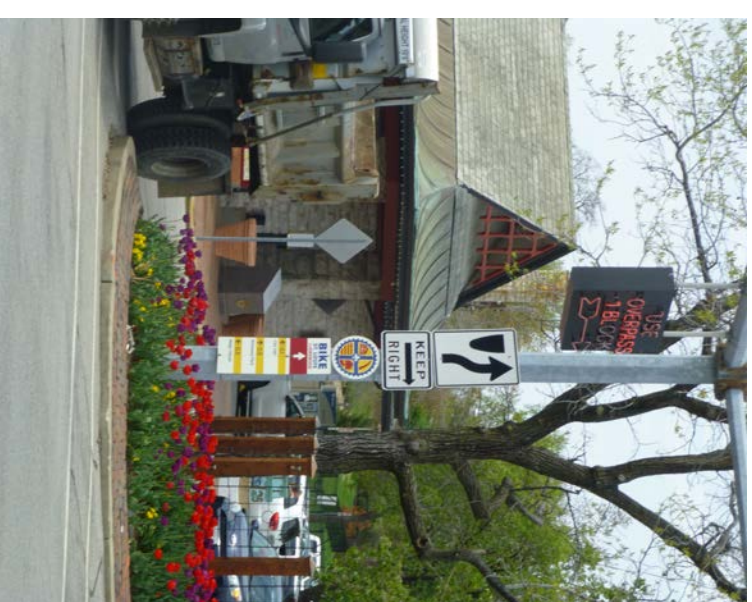
Bicycle lanes are recommended on Argonne Drive. The street is wide enough to accommodate bicycle lanes, but the current angled parking would make traditional, right-side bicycle lanes dangerous. The bicycle lanes must be accompanied by a conversion to back-in angled parking, in order to reduce the chance of crashes. Alternatively, left-side bicycle lanes could be installed adjacent to the existing medians once the turn-arounds are closed to car traffic. See the pedestrian recommendations for Argonne Drive (pg ?), for more information.

## Bicycle Prioritization

The proposed bicycle improvements in Kirkwood are broken into three phases. Each phase is presented as a coherent set of projects that will provide connectivity to important destinations, and build upon one another.

The first phase focuses on connecting parks and regional trails in Kirkwood, in addition to connecting existing bicycle infrastructure. The first phase is the largest, as it establishes a network for bicycling in Kirkwood, that can be built upon in the future. The total mileage for Phase 1 is 10.8 miles with an estimated cost of approximately \$930,900 (See Figure 12).

The second phase focuses on connecting neighborhoods to the bicycling network. The total mileage is 9.3, with an estimated cost of approximately \$1,148,200 (See Figure 13). The third phase expands the network to enhance connectivity. This is the smallest phase with a total length of 4.1 miles and an estimated cost of approximately \$530,200 (See Figure 14). The recommended improvements along routes owned by MoDOT and St. Louis County make up 10.5 miles and are estimated to cost \$842,300. The majority of these projects involve restriping and should be considered when the streets are scheduled for routine maintenance. The recommendations for Manchester will require right of way acquisition, and are part of the Gateway Bike Plan.



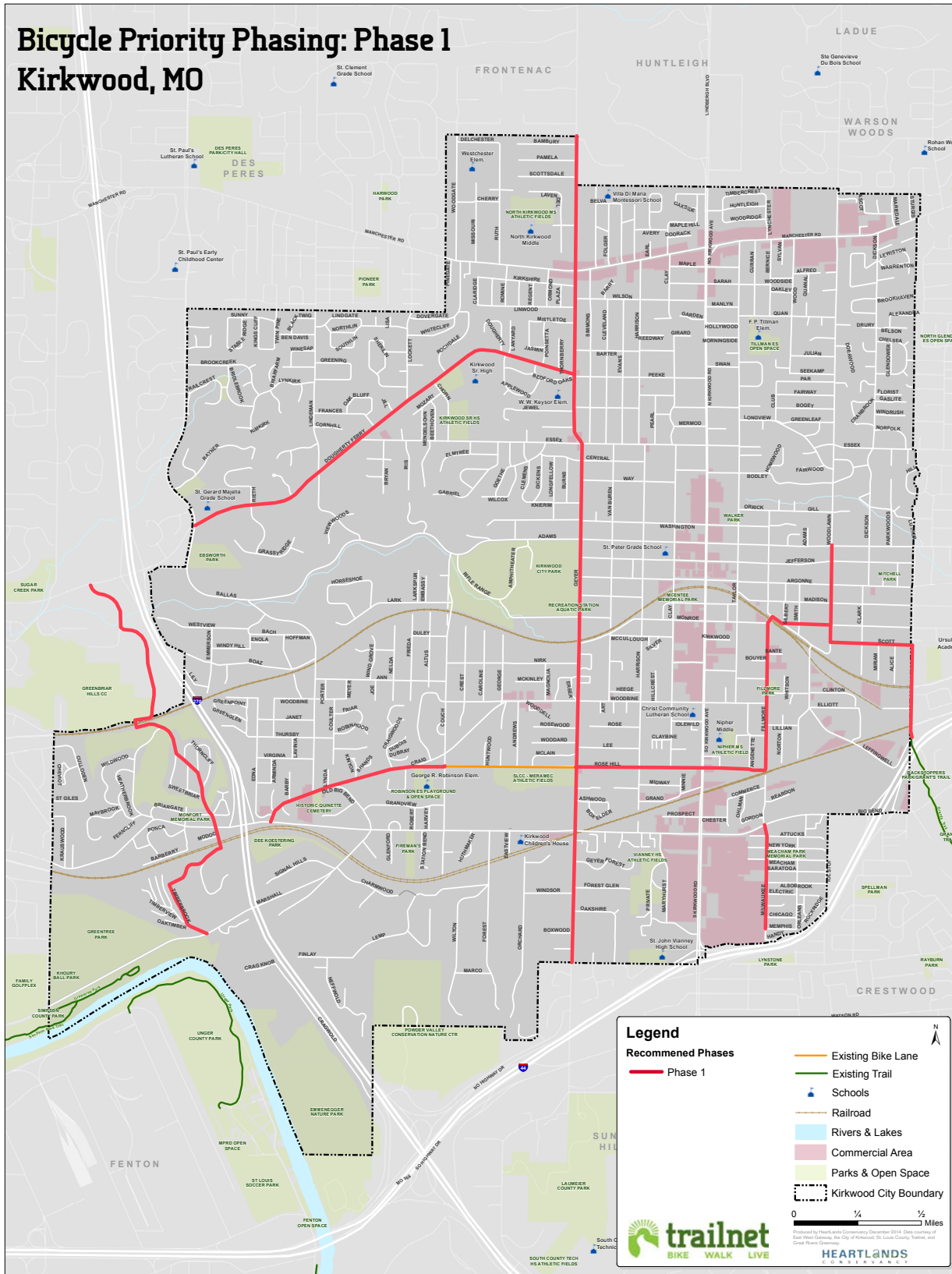
*Bike St. Louis in Kirkwood signage helps mark the bicycling route from Grant's Trail to Downtown Kirkwood.*



*The trailhead for Grant's Trail, one of the region's most popular biking corridors, is in Kirkwood.*

Figure 13:

# Bicycle Priority Phasing: Phase 1 Kirkwood, MO



Recommended routes do not prevent all streets from being used for walking and bicycling.

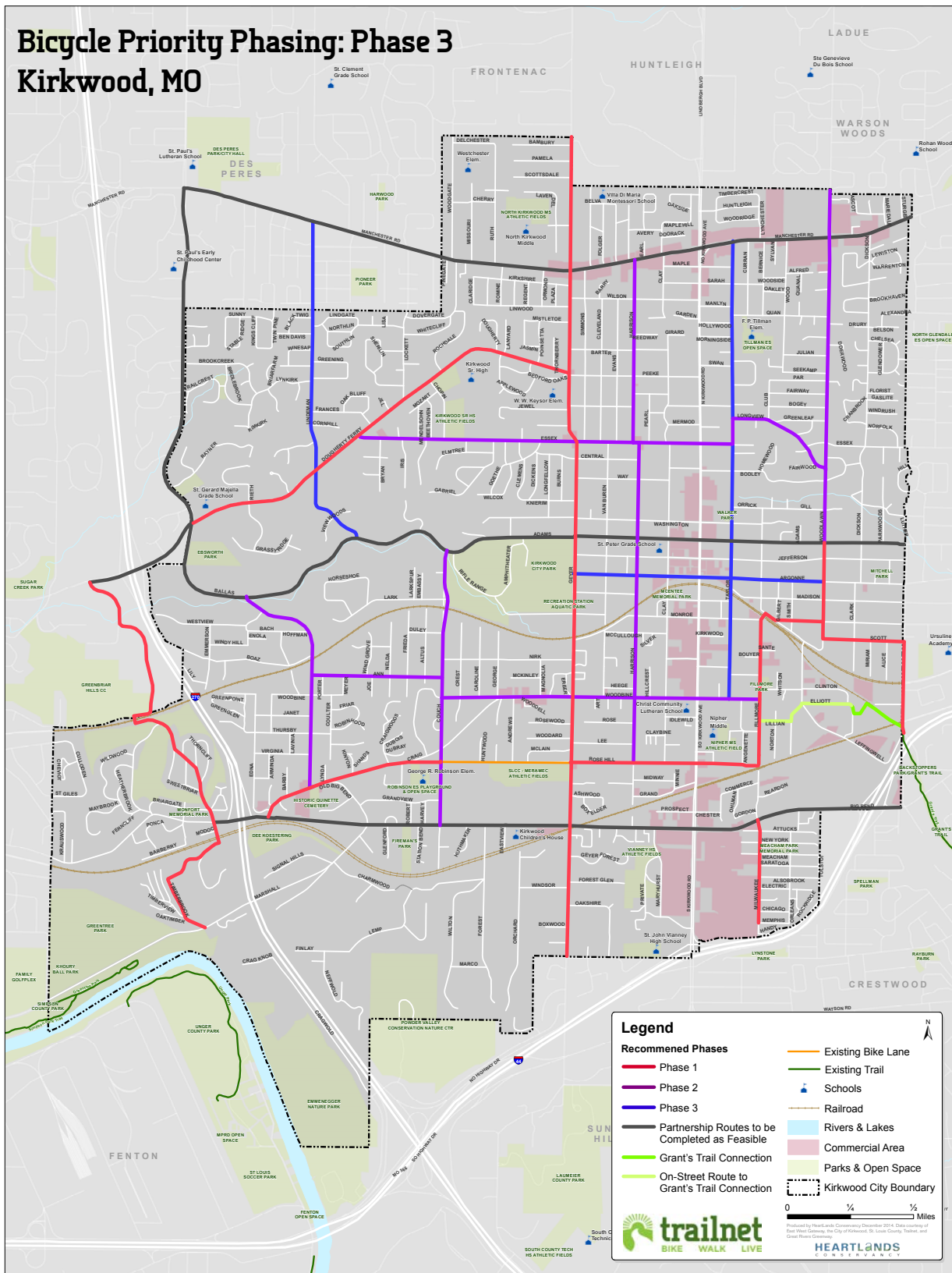






Figure 15:

# Bicycle Priority Phasing: Phase 3 Kirkwood, MO



Recommended routes do not prevent all streets from being used for walking and bicycling.

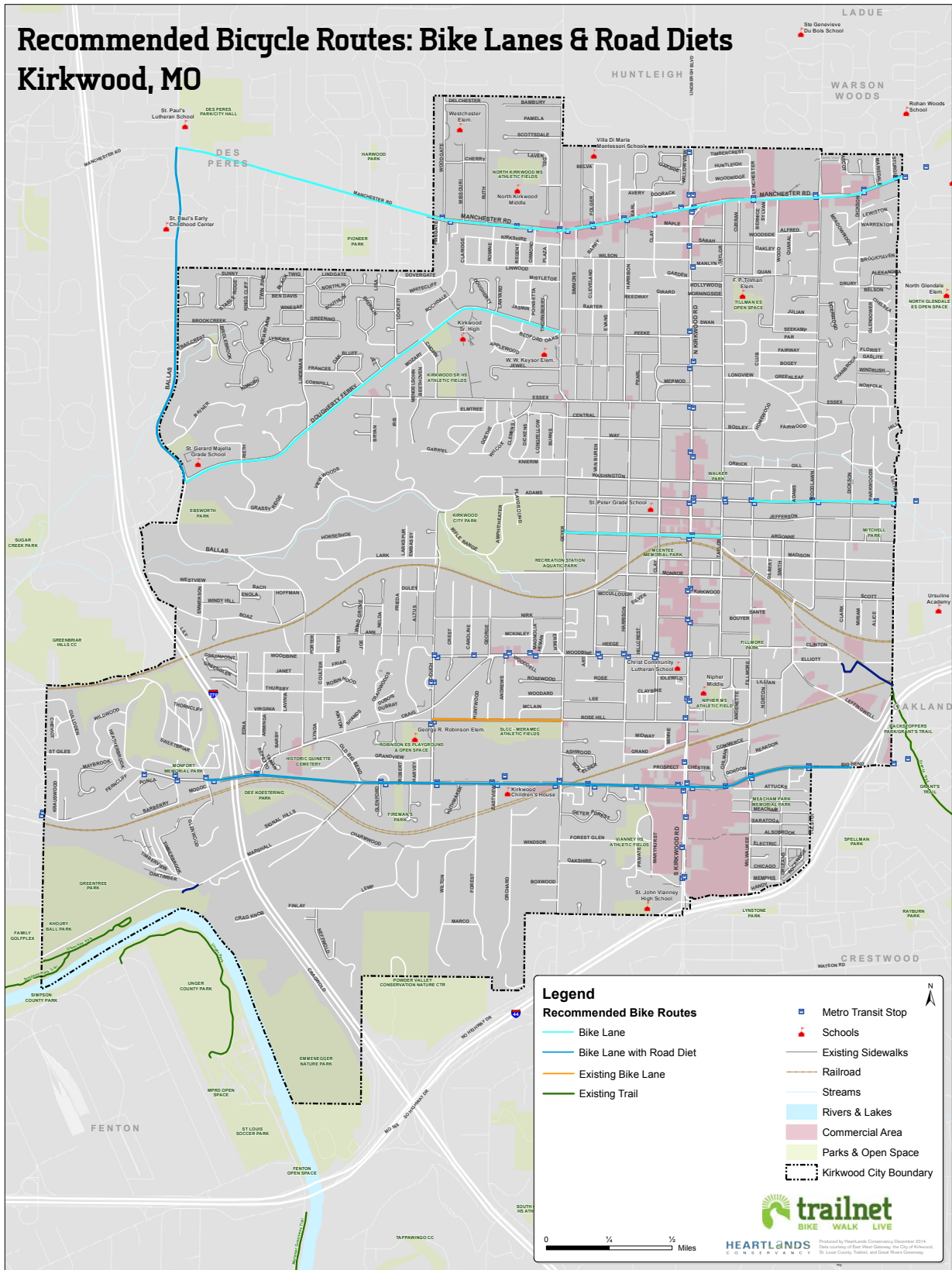
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Figure 16:

# Recommended Bicycle Routes: Bike Lanes & Road Diets

## Kirkwood, MO

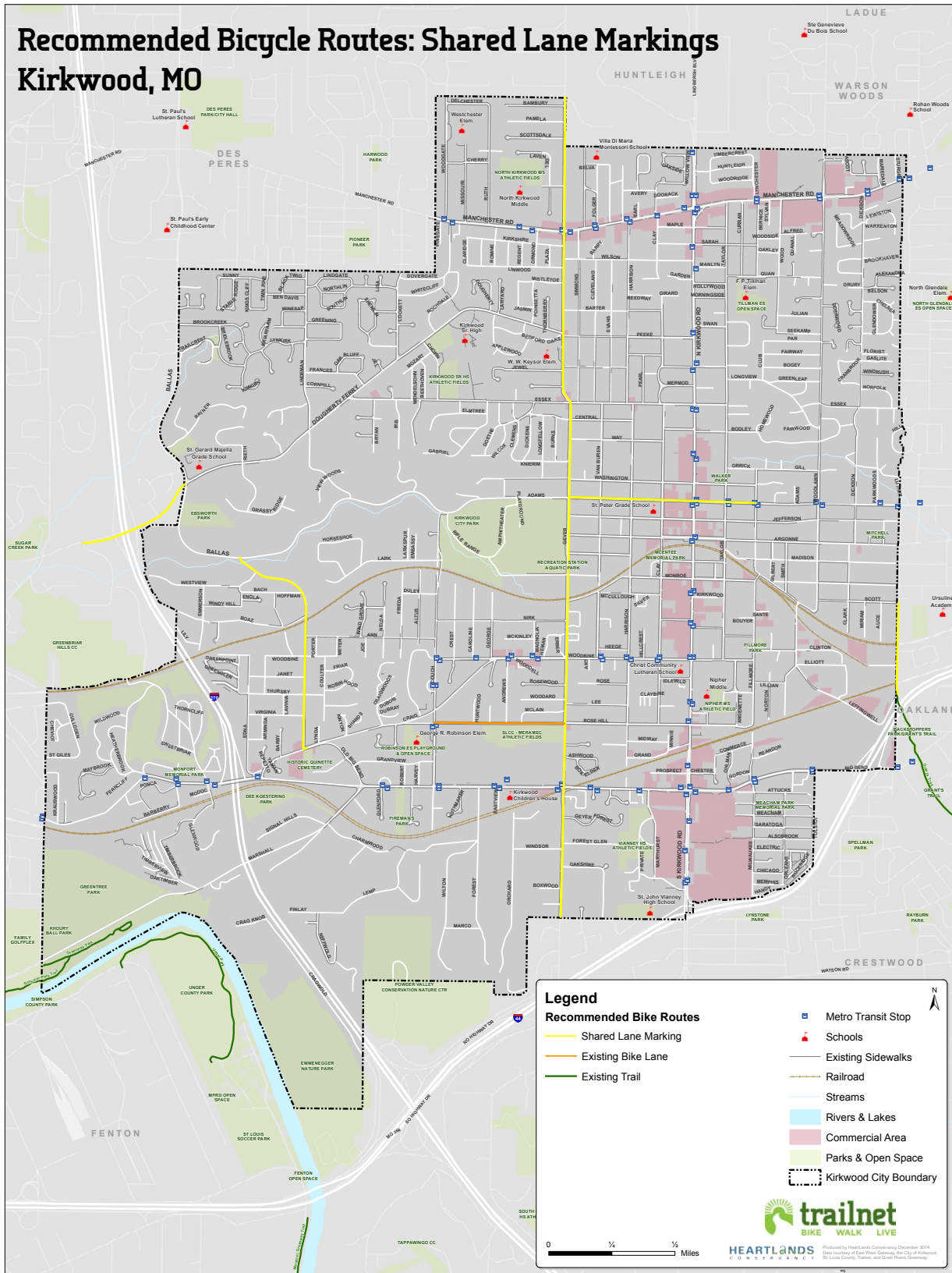


RECOMMENDED ROUTES DO NOT PREVENT ALL STREETS FROM BEING USED FOR WALKING AND BIKING



Figure 17:

# Recommended Bicycle Routes: Shared Lane Markings Kirkwood, MO

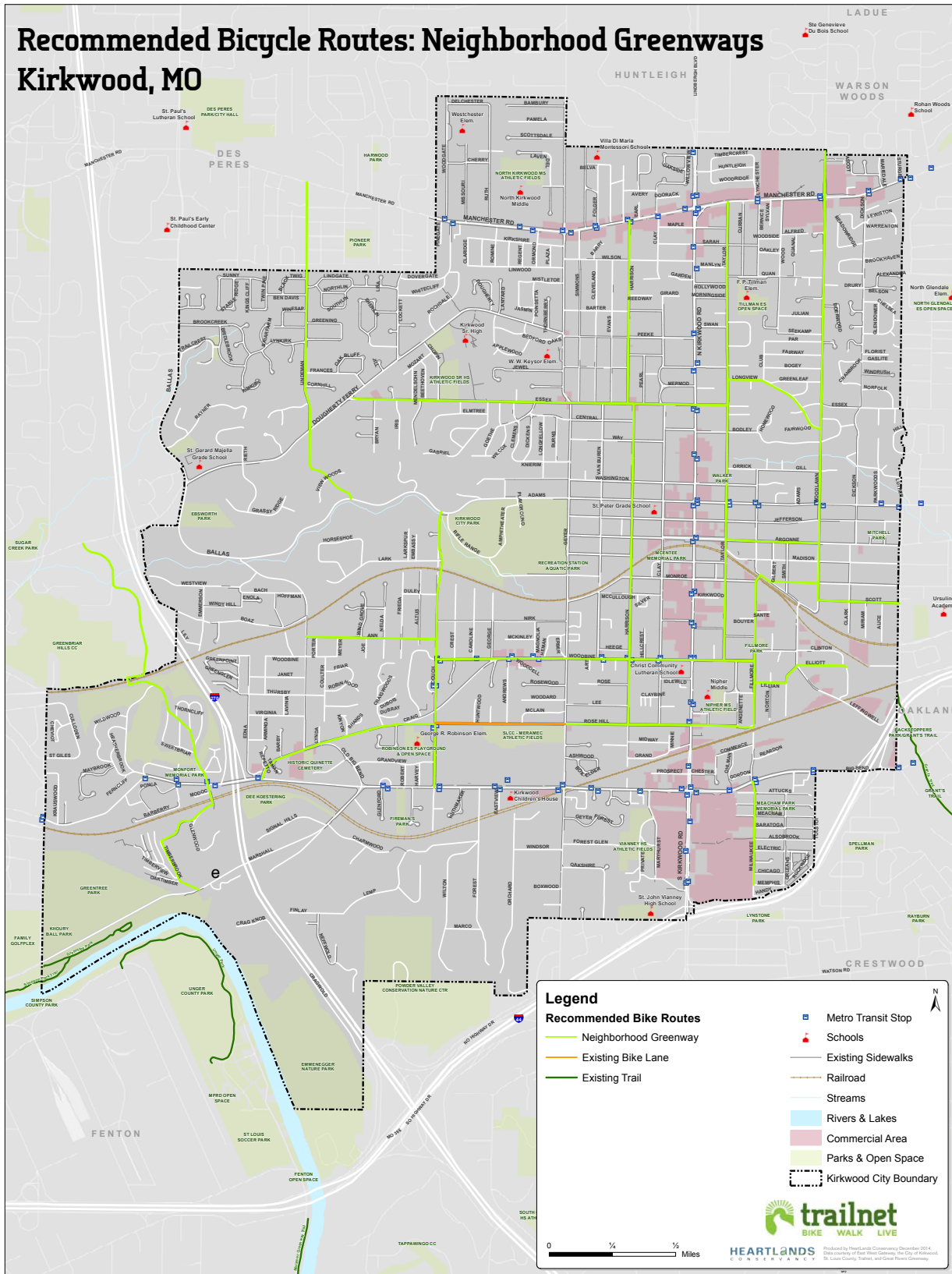


RECOMMENDED ROUTES DO NOT PREVENT ALL STREETS FROM BEING USED FOR WALKING AND BICYCLING



Figure 18:

# Recommended Bicycle Routes: Neighborhood Greenways Kirkwood, MO



RECOMMENDED ROUTES DO NOT PREVENT ALL STREETS FROM BEING USED FOR WALKING AND BIKING

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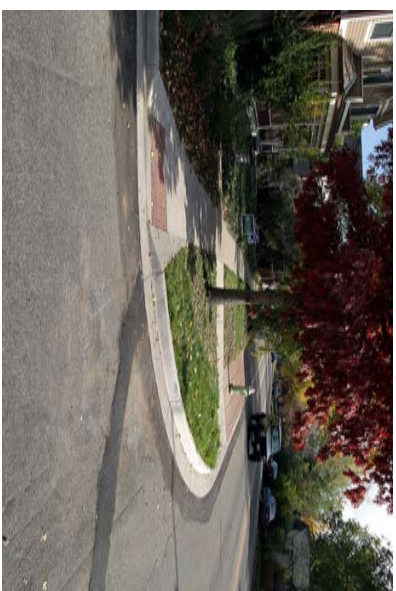
## Design Guidelines

### The American with Disabilities Act (ADA)

In 1990, Congress passed the American with Disabilities Act, which prohibits discrimination and ensures equal opportunities for people with disabilities. This includes planning in the public rights of way and assuring accessibility for all roadway users. Title II of the American with Disabilities Act requires all public rights of way and facilities be accessible for all users.

It is important to assure all pedestrian facilities accommodate people with disabilities. There are several retirement facilities in Kirkwood, and it is important to provide a comfortable and safe walking environment for these residents that may be unable to drive or lack access to a car.

The United States Access Board develops guidelines for public rights of way for various users including people with visual impairments and people in wheelchairs. These guidelines cover pedestrian access to streets and sidewalks (crossings, curb ramps, etc), roadway designs, constraints such as slopes, and placement of street amenities (benches, signs, bus stops, etc.) Below is a list of common pedestrian facilities and minimum ADA standards and design guidelines. It is important to note, these are only minimums. To achieve an optimal pedestrian environment, sidewalks, for instance, should actually be wider.



*Curb ramps should be in the direction of travel.*  
Photo by: Dan Burden, [www.pedbikeimages.org](http://www.pedbikeimages.org)



*Trees and shrubs can block sidewalks if left untrimmed.*  
Photo by: Justin Przyby, [www.pedbikeimages.org](http://www.pedbikeimages.org)

- Sidewalks – Minimum width for the pedestrian access route of a sidewalk is four feet. This means that the clear zone should be four feet. If planning to add amenities (street furniture, etc.) in the right of way, then sidewalks should be much wider. To accommodate for passing, sidewalks should be a minimum of five feet, otherwise sidewalks should include intervals of passing space every 200 feet. Sidewalk grade and pedestrian access routes should be no greater than five percent grade.

- Curb ramps – The minimum dimension of the turning space of a curb ramp shall be four feet by five feet, while the running slope shall be five percent minimum but no greater than 8.3 percent.

- Detectable warning surfaces – Delineate the boundary between the pedestrian access route and vehicular routes. All curb ramps shall consist of truncated domes aligned in a square or radial grid pattern. Detectable warning surfaces shall also contrast with adjacent surfaces, either light on dark or dark in light. Bright yellow is a popular color for truncated domes.

- Pedestrian Signals – All pedestrian signal phase timing shall comply with the Manual on Uniform Traffic Control Devices (MUTCD). Accessible pedestrian signals provide information in non-visual formats. Accessible signals can be integrated into the pushbutton, as to activate a sound when the WALK signal

activates. Signal standards and designs must follow MUTCD guidelines, which can be found here: <http://mutcd.fhwa.dot.gov/html/2009/part4/part4e.htm>.

There are many resources available to ensure pedestrian facilities are complying with ADA guidelines and regulations. All federally funded projects including new and altered facilities must comply with ADA guidelines.

## Resources

- United States Access Board: Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way: <http://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/proposed-rights-of-way-guidelines>

- Federal Highway Administration: Americans with Disabilities Act/ Section 504 of the Rehabilitation Act of 1973 (504): <http://www.fhwa.dot.gov/civilrights/programs/ada.cfm>

- Federal Highway Administration: Designing Sidewalks and Trails for Access: [http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/publications/sidewalks/index.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalks/index.cfm)

- United States Access Board ADA Standards: <http://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/ada-standards>

- US Department of Transportation: Bicycles and Pedestrians: <http://www.dot.gov/bicycles-pedestrians>

- United States Access Board Public Rights-of-Way Resources: <http://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/other-prow-resources>

- Accessible Pedestrian Signals: A Guide to Best Practices: <http://www.apsguide.org/index.cfm>

- US Department of Transportation: Accessible Sidewalks and Street Crossings: [http://www.bikewalk.org/pdfs/sopada\\_fhwa.pdf](http://www.bikewalk.org/pdfs/sopada_fhwa.pdf)

- Federal Highway Administration: Manual on Uniform Traffic Control Devices: <http://mutcd.fhwa.dot.gov/index.htm>



*Gaps between the roadway and rail can pose a danger to people walking, biking, or using mobility devices.*



*Railroad crossings can be a challenge for people traveling by bicycle.*

## At Grade Railroad Crossings

### What

When a street or trail crosses a railroad track, the crossing must be safe for all modes. For years, railroads and the Department of Transportation have worked to close at grade railroad crossings to increase safety and efficiency. At grade crossings for light rail (e.g. Metrolink) and heavy rail (e.g. freight or Amtrak trains) have different challenges and regulations due to speed and size of the trains; pedestrian at grade crossings for light rail are more common and easily accommodated than at grade crossings for heavy rail.

### Why

For people walking and biking, smooth surface treatments at crossings are very important to prevent bicycles and other wheeled vehicles from getting stuck in the tracks.

### When

At Grade Railroad Crossings are used when it is impractical to provide underpasses or overpasses for people walking, bicycling, or driving across the railroad tracks. When there is frequent trespassing, either providing a crossing or channelization should be considered to increase safety.

If there are no safe, nearby crossings to channelize pedestrians toward, a railroad crossing should be considered. Any new crossing must be approved by the railroad company and the Missouri Department of Transportation. At Grade Railroad Crossings

should NOT be considered when a crossing would be dangerous due to sight lines or speed and volume of train traffic, or when trains are frequently stopped in the crossing area.

### How

Every railroad crossing provides unique challenges. The design should be based on engineering judgment and close collaboration between the railroad and the agency that owns the roadway or path crossing the railroad. In Designing Sidewalks and Trails for Access, the FHWA provides the following best practices:

- Approaches to the track and the area between the tracks should be raised to the level of the top of the rail because rail ties that are not flush with the travel surface create a tripping hazard in addition to the gap hazard. A surface material that will not buckle, expand, or contract significantly (e.g., textured rubber railroad crossing pads) should be used;
- Approaches to the track should ramped with minimal grades and should be flat for a distance of 1.525 m (5 feet) on either side of the tracks, free of obstacles, and have a firm and stable surface;
- For recreation trails, the trail surface should be hardened to reduce the debris that scatters over the tracks as users pass;
- Sight lines and signage should ensure that all users, and particularly those with disabilities affecting hearing, vision, or

mobility impairments, have adequate warning about the intersection;

- Signals and/or gates should be considered to warn trail users of the rail crossing.

The gap between the roadway and the rail, called the flangeway, can be dangerous for people walking, biking, or using wheeled devices. For light rail trains, a rubber flangeway filler can improve safety and access. However, there are no flangeway fillers currently available for heavy rail. In order to mitigate danger, paths and sidewalks should direct pedestrians and bicyclists across railroad tracks at 90 degrees.

### Using the street

All users should check for trains and pay attention to signage and active warning devices. Bicyclists and wheeled devices should cross tracks at a 90 degree angle.

### Resources

- Compilation of Pedestrian Safety Devices In Use at Grade Crossings (Federal Rail Administration, 2008): <https://www.fra.dot.gov/elib/Details/L02732>
- Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide (FHWA, Updated 02/10/2014): [http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/publications/sidewalk2/sidewalks216.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks216.cfm)

- Guidance on Traffic Control Devices at Highway-Rail Grade Crossings (FHWA, 2002) <http://safety.fhwa.dot.gov/media/twgreport.htm>.

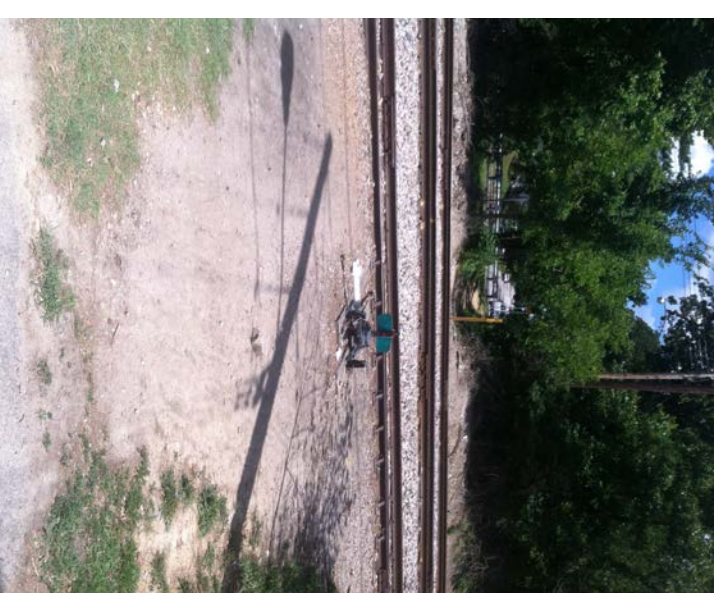
- Guide for the Development of Bicycle Facilities (American Association of State Highway and Transportation Officials, 2012): 4.12.1 Railroad Grade Crossings

- Manual on Uniform Traffic Control Devices (US Department of Transportation, 2009): Section 8D. Pathway Grade Crossings

- Rails-with-Trails: Lessons Learned (FHWA, Updated: 02/11/2014)

SECTION IV: Legislation, Liability, and Insurance: [https://www.fhwa.dot.gov/environment/recreational\\_trails/publications/rwt/page18.cfm#s4i](https://www.fhwa.dot.gov/environment/recreational_trails/publications/rwt/page18.cfm#s4i)

SECTION V: Design: Crossings [https://www.fhwa.dot.gov/environment/recreational\\_trails/publications/rwt/page22.cfm#s5f](https://www.fhwa.dot.gov/environment/recreational_trails/publications/rwt/page22.cfm#s5f)



*An employee at the store adjacent to the informal railroad crossing reported seeing students walk across the railroad tracks daily.*



*The path to the railroad tracks is well defined at Fillmore.*



Bicycle Lane

Photo by: Jennifer Campos, [www.pedbikeimages.org](http://www.pedbikeimages.org)

## Bicycle Lanes

### What

Bicycle lanes are defined by solid white lines 5' or more from the edge of the roadway. Painted bicycle symbols show the lanes are reserved for the exclusive use of bicyclists.

turning turning left or right.

Bicyclists should be aware of motor vehicles turning at intersections. Bicyclists are not required to ride in the bicycle lanes.

### Resources

- Manual on Uniform Traffic Control Devices, 2009 (US Department of Transportation): Section 9C.04 Markings for Bicycle Lanes

**Why**  
Bicycle lanes improve safety and create a comfortable space for bicyclists of all levels. Cities in the United States with more developed bike lane networks tend to have higher rates of cycling and lower bicycle crash rates.

### When

Bicycle lanes are most useful on streets with volumes over 3,000 ADT and speed limits under 35 mph. They should not be placed to the right of right turn lanes.

### How

Bicycle lanes should be 5' or wider. They are defined by solid white lines with bicycle markings and arrows placed in the lanes. Bike lanes can be continued through intersections using dotted lines. They should not be placed to the right of right turn only lanes.

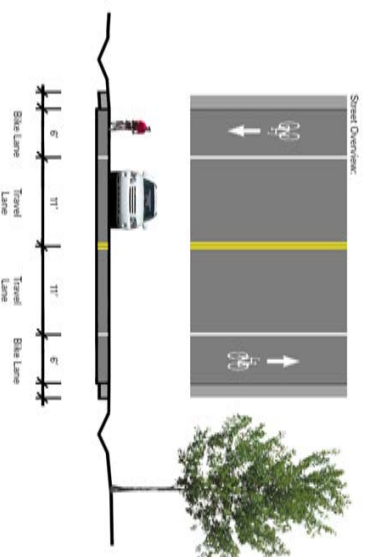
Bicycle lanes can be retrofitted onto existing streets that are below capacity through narrowing traffic lanes (a lane diet), or removing traffic lanes (a road diet).

### Using the street

Motorists may not drive in the bicycle lanes. Motorists should check for bicyclists when

- Urban Bikeway Design Guide, Second Edition (National Association of City Transportation Officials) <http://nacto.org/cities-for-cycling/design-guide/bike-lanes>

Figure 19: Example Bicycle Lane



## Bicycle Parking

Secure bicycle parking is essential for people who use their bicycles for any kind of trip.

### Design

Bicycle racks must support the bicycle frame and allow the user to lock both their frame and their front wheel to the rack simultaneously (two-point locking). Many bicycles feature “quick-release” tires that can be removed within seconds, so many bicyclists insist on two-point locking.

The safest, easiest, and most cost-effective design is the u-rack, shaped like an inverted U. One rack can support two bicycles, and costs approximately \$100. Creative racks typically cost far more money, and do not provide the safety or capacity of a standard u-rack. Wave racks, schoolyard racks, and comb racks do not support the frame, and can bend the tires on bicycles.

### Placement

Destinations that should offer bicycle parking:

- Civic buildings
- Parks
- Schools
- Trailheads
- Stores
- Restaurants
- Apartment buildings

Racks should be placed at least 24” from the nearest wall and 30” from the nearest rack.

Racks should be placed near convenient entrances for bicyclists, without blocking doorways or presenting trip hazards to pedestrians. Racks should be placed in conspicuous, well-lit areas to discourage theft. When possible, racks should be placed under roof overhangs or shelters to protect bicycles.

### Cost

For private development, the City can require developers to provide bicycle parking, just as it does with car parking.

Basic u-racks are approximately \$100 each.

The installation is estimated at \$200 for labor.

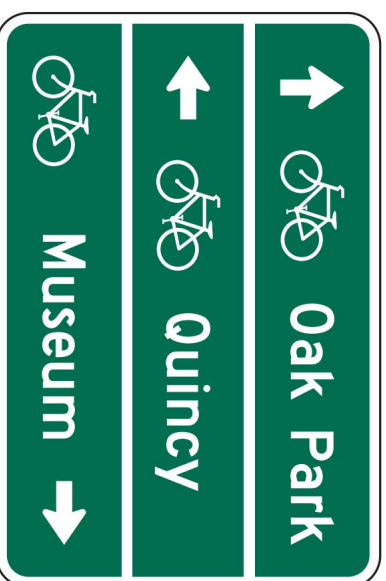
More information on site design and rack placement can be found in the Association of Pedestrian and Bicycle Professionals’ “Bicycle Parking Guidelines.” ([c.vimcdn.com/sites/www.apbp.org/resource/resmgr/publications/bicycle\\_parking\\_guidelines.pdf](http://c.vimcdn.com/sites/www.apbp.org/resource/resmgr/publications/bicycle_parking_guidelines.pdf))



*U-racks are sturdy, affordable, and popular.*



*Decorative bicycle racks can be difficult to use and expensive.*



**Figure 20: Wayfinding can be incorporated into Bike Route Signs**



*Unique signs can help brand the neighborhood greenways  
Photo by: Adam Fukushima, [www.pedbikeimages.org](http://www.pedbikeimages.org)*

## Designated Route Signage

### What

Designated route signs help guide people walking and biking along safer, lower-traffic streets. Signs should include information on popular destinations and distance. Well-designed signs can enhance the aesthetics and sense of place.

### Why

The best routes for driving are not necessarily the best routes for walking and biking. Many residents may not be familiar with navigating local streets beyond their own neighborhood. Wayfinding signs raise awareness of walking and biking as an option, and help people find destinations through local streets.

### When

Route signs should be placed along safe streets for biking and walking. The frequency of signs depends on the number of turns in the designated route. At a minimum, signs should be placed before and after every turn or junction to ensure people are able to navigate the routes.

### How

The Manual on Uniform Traffic Control Devices contains Bicycle Route signs (Section 9B.21). These signs can contain destination and distance information. Many cities choose to create customized signs, which enhance local identity, and/or contain pedestrian information as well. The Bike St. Louis wayfinding signs are a local example of custom wayfinding.

### Using the street

Route signs do not alter how people driving, walking, or biking use the street.

### Resources

- Manual on Uniform Traffic Control Devices, 2009 (US Department of Transportation):  
Section 9B.20 Bicycle Guide Signs
- Wayfinding System Study (City of Portland, Maine, 2008): <http://www.portlandmaine.gov/planning/wayfindingreport.pdf>
- Urban Bikeway Design Guide, Second Edition (National Association of City Transportation Officials): <http://nacto.org/cities-for-cycling/design-guide/bikeway-signing-marking/bike-route-wayfinding-signage-and-markings-system/>

## Intersections

Throughout the public engagement process, Kirkwood residents expressed interest in enhanced intersection design to increase safety and comfort. At intersections, people walking, biking, and driving have to negotiate with traffic coming from multiple directions. The complexity of intersections necessitates a careful design approach taking into account volume, lane configuration, and speeds. The following treatments are recommended as potential solutions for intersections in Kirkwood.

### High visibility crosswalks

Crosswalks with thick lines perpendicular to the pedestrian's path, as opposed to the traditional parallel lines, increase visibility for people driving. High Visibility Crosswalks are appropriate for any place where crosswalks should be used. High visibility crosswalks should be used near schools, and other destinations that draw a high volume of pedestrians. High visibility crosswalks can be used at signalized intersections, at mid-block crossings, and at stop-controlled intersections. On streets with more than three lanes, or with high volumes or speed, crosswalks alone will not improve safety.

### Pedestrian safety islands

On streets with more than two lanes, pedestrian safety islands, or medians, can enhance safety and allow pedestrians to cross the street in two stages. Safety islands are especially important for intersections near schools, childcare facilities, and retirement homes, or other locations that are likely to

attract pedestrians that may walk more slowly than the general population. Medians can also help to calm traffic by narrowing the lane width. The pedestrian safety island should be defined by concrete, but the area where the pedestrians stand does have to be raised above street level.

### Restrict right turn on red

Restricting right turns on red signals improves pedestrian safety with relatively low costs. Right turns on red can increase pedestrian crashes, as drivers may not yield to the pedestrians, though they are legally required to do so. The restriction should be considered as a possible solution near schools or other locations where there are a high number of pedestrians.

### Right-sizing intersections

Safety for all users can be improved by retrofitting intersections to include more pedestrian space and a context-sensitive design speed. Intersections that have excess space for motor vehicles, such as wide lanes and corner radii designed for high speeds, encourage fast driving. In residential neighborhoods and in Downtown Kirkwood, intersections with wide corner radii and long pedestrian crossing distances offer an opportunity to improve safety and increase compliance with traffic laws at a relatively low cost. Every intersection is unique and will have a different solution; all road projects in residential neighborhoods or downtown should be seen as an opportunity to right-size intersections. Tools include pedestrian safety islands and curb extensions (pg xx).

On streets with existing medians, the median



*Safe intersection design can encourage walking  
Photo by: Dan Burden, [www.pedbikemages.org](http://www.pedbikemages.org)*



*Right turn on red restrictions can increase*



*Decorative raised crosswalk.*  
Photo by: Kristen Langford, [www.pedbikeimages.org](http://www.pedbikeimages.org)

should be extended to the crosswalk in order to provide protection for people walking and to encourage drivers to drive carefully through the intersection. A pedestrian safety island can be created by adding a curb to the opposite side of the crosswalk.

### Signal timing

Signal timing offers an inexpensive way of enhancing walking and biking safety and comfort. Signals should be timed to provide adequate time for pedestrians to cross the street. The MUTCD requires a minimum of 7 seconds for the initial walk phase. The entire walk phase should allow a pedestrian to cross the street at an average of 3.5 seconds or less (4E.06). Lower speed calculations should be used near schools, retirement homes, or other places where pedestrians may walk more slowly than the general population.

### Resources

- The Urban Street Design Guide
  - <http://nacto.org/usdg/intersection-design-elements/crosswalks-and-crossings/conventional-crosswalks/>
  - <http://nacto.org/usdg/pedestrian-safety-islands/>
  - <http://nacto.org/usdg/intersection-design-elements/corner-radii/>
- The FHWA Pedestrian Safety and Countermeasure Selection System: <http://www.pedbikesafe.org/PEDSAFE/>
- [countermeasures\\_detail.cfm?CM\\_NUM=49](http://www.pedbikesafe.org/countermeasures_detail.cfm?CM_NUM=49)

<h2>Mid Block Crossings</h2> <p><b>What</b></p> <p>A mid block crossing is a safe pedestrian or bicycle crossing that is not at an intersection used by motor vehicles.</p> <p><b>Why</b></p> <p>Mid-block crossings improve safety in places where it is likely that people walking will want to cross the street. When people are walking across the street frequently without a crossing, it can create danger and uncertainty for all road users. Long blocks and infrequent crossings can also cause minutes of delay for people walking out of their way to use a crossing signal.</p> <p><b>When</b></p> <p>Mid-block crossings are appropriate in places where a pedestrian “desire line” crosses the street in the middle of the block. Common pedestrian destinations including schools, parks, libraries, bus stops, and shops often entice pedestrians to cross the street away from a crossing. In areas of town with longer blocks (over 400 ft long), mid-block crossings should be considered to provide pedestrians with a safe way to cross the street.</p> <p><b>How</b></p> <p>On low traffic, residential streets a high visibility crosswalk may be sufficient. On higher volume or higher speed streets, mid-block crossings should be designed to ensure safety for all users. Options include:</p>	
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*Mid block crossings can improve safety.*  
Photo by: Lyubov Zuyeva, [www.pedbikeimages.org](http://www.pedbikeimages.org)

**Raised crossings**, which improve visibility of pedestrians, while also slowing car traffic. Raised crossings are appropriate on neighborhood streets. Their design must take into account drainage and emergency access.

**Pedestrian safety islands**, which allow people to cross in two phases. These are appropriate on higher traffic streets, and can also have a traffic calming effect. For more information, see pg 43.

**Rectangular rapid flash beacons (RRFB)**, which are appropriate for streets with higher traffic volumes. An RRFB consists of two poles with flashing lights activated by a pedestrian. The RRFB signals drivers to yield to the pedestrian. The drivers can proceed once the pedestrian has cleared the intersection.

**High intensity crosswalk beacons (HAWK)**, which are appropriate on the busiest and fastest streets. A HAWK or Pedestrian Hybrid Beacon, is hung overhead, like a traffic signal, and is based on beacons used at railroad crossings. When a pedestrian activates a HAWK, it flashes yellow and then turns solid red, as the pedestrian crosses the street. The HAWK continues to flash red as the pedestrian crosses, allowing drivers to proceed through the intersection once it is cleared, as opposed to a traditional signal.

### Using the street

People walking should check for traffic before entering the street; drivers should yield to people in the crossing.

### Resources

- Urban Street Design Guide (National Association of City Transportation Officials): <http://nacto.org/usdg/intersection-design-elements/crosswalks-and-crossings/midblock-crosswalks/>
- Manual on Uniform Traffic Control Devices (US Department of Transportation, 2009): Chapter 4F: Pedestrian Hybrid Beacons Interim approval for RRFBs: [http://mutcd.fhwa.dot.gov/resources/interim\\_approval/ia11/fhwamemo.htm](http://mutcd.fhwa.dot.gov/resources/interim_approval/ia11/fhwamemo.htm)



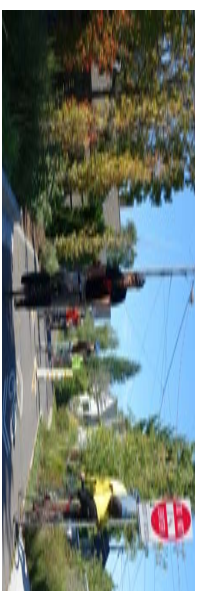
*High Intensity Crosswalk Beacons*

*Photo by: Mike Cynnecki, [www.pedbikeimages.org](http://www.pedbikeimages.org)*



*High Intensity Crosswalk Beacons*

*Photo by: Micheal Frederick, [www.pedbikeimages.org](http://www.pedbikeimages.org)*



## Neighborhood Greenways

### What

Neighborhood greenways, or bicycle boulevards, are streets that are designed for people biking and driving to share the street safely. They are neighborhood streets with low volume and low speed where signs and traffic calming help people to feel safe walking and biking.

### Why

Many neighborhood streets already serve as popular walking and biking routes. Neighborhood greenways are a low-cost way to leverage these existing routes into a safe, connected network for people of all ages and abilities.

### When

Neighborhood greenways are most appropriate for local streets with less than 3,000 vehicles per day. Ideally traffic will be less than 1,5000 vehicles per day. The street should have good pavement and should be prioritized for repaving, as the quality of pavement impacts bicyclists.

### How

The essential features of a neighborhood greenway are signs and pavement markings to designate the route and a posted speed of 20 mph, with traffic calming designed to reduce speeds to 20 mph. Traffic diversion can be used to ensure traffic volumes under 3,000 vehicles per day. At intersections with neighborhood streets, a two-way stop should be used,

giving priority to the neighborhood greenway in order to allow bicyclists to proceed safely and comfortably. At intersections with major streets, protected crossing treatments should be used for safety and convenience.

### Using the street

Drivers should use the street for local travel only and respect the priority of bicyclists.

### Resources

- Urban Bikeway Design Guide, Second Edition (National Association of City Transportation Officials): <http://nacto.org/cities-for-cycling/design-guide/bicycle-boulevards/>



Neighborhood Greenways  
Photos by: Greg Ralsman

## Pedestrian Plazas

### What

Pedestrian plazas create space for people to walk, socialize, and enjoy the public realm. In cities across the US, pedestrian plazas are being created in underutilized street space with low-cost and attractive infrastructure, including large planters, paint, and seats. In Kirkwood, a pop-up pedestrian plaza was installed on Argonne and was well received by residents and visitors alike.

### Why

Pedestrian plazas can enhance the sense of community by creating informal places for socialization. They can also bolster sales at local businesses, by creating comfortable places for people to linger and eat donuts or drink coffee. Plazas that are designed to have a traffic-calming impact can also reduce speeding and help pedestrians to cross the street safely, by reducing their exposure to traffic.

### When

Pedestrian plazas are typically placed in sections of the street that have low vehicle traffic and are not necessary for safe and efficient operating of motor vehicles. Pedestrian plazas should be considered for streets with existing pedestrian demand or in places where they can improve pedestrian safety and accessibility. Argonne in Kirkwood is an example.

### How

Pedestrian plaza design varies greatly, as they

are often placed in “reclaimed” space. They are typically created using low-cost but attractive planters, paint, chairs and tables. A pedestrian plaza must follow three guidelines:

- Parking not allowed;
- ADA compliant design with tactile warning strips at crosswalks;
- Defined and strong edge using striping, bollards and fixed objects.

In addition, a pedestrian plaza should be designed to create a place for people; chairs, tables, and umbrellas are one of the most popular additions to pedestrian plazas.

### Using the street

Pedestrians should enjoy the new space. Motor vehicles should not drive or park in the plaza. Bicyclists should dismount in the plaza

### Resources

- Urban Street Design Guide (National Association of City Transportation Officials): <http://nacto.org/usdg/interim-design-strategies/interim-public-plazas/>



*Pedestrian Plazas*  
Photo by: Laura Sandt, [www.pedbikeimages.org](http://www.pedbikeimages.org)

## Road diet

### Why

A road diet allows for easier left turns for people driving, reduces the number of motor vehicles exceeding the speed limit, increases safety for all modes, and makes room for people walking and biking.

### What

Four lanes of traffic are restriped to create two through lanes of traffic. Kirkwood Rd. in downtown Kirkwood is an example.

### When

On four-lane roads with less than 20,000 ADT, a three lane road diet can improve traffic flow through the center turn lane, while giving room to people biking and walking

### How

A four lane roadway can be restriped to two throughways. This creates room for parking and left turn lanes at intersections.

## Shared lane markings

### What

A white bicycle and two chevron arrows are painted in the middle of the traffic lane. The shared lane markings are applied along the entire bicycle route to help guide cyclists.

### Why

Shared lane markings alert drivers to the presence of cyclists. The markings indicate proper lane position to cyclists and to drivers.

### When

Shared lane markings should be used on street with speeds under 30 mph and with less than 3,000 ADT. Streets with shared lane markings should not have centerlines, as they discourage the sense of shared space.

### How

Shared lane markings should be placed every 100 to 250 feet or more along a street. More frequent placing is used to guide cyclists along higher traffic routes or as wayfinding along routes with frequent turns.

### Using the street

Motorists should give cyclists room to operate safely. If there is no opposing traffic, they may pass on the left, giving cyclists at least 3 feet of passing distance.

Cyclists should position themselves over the shared lane markings to increase safety, visibility, and predictability

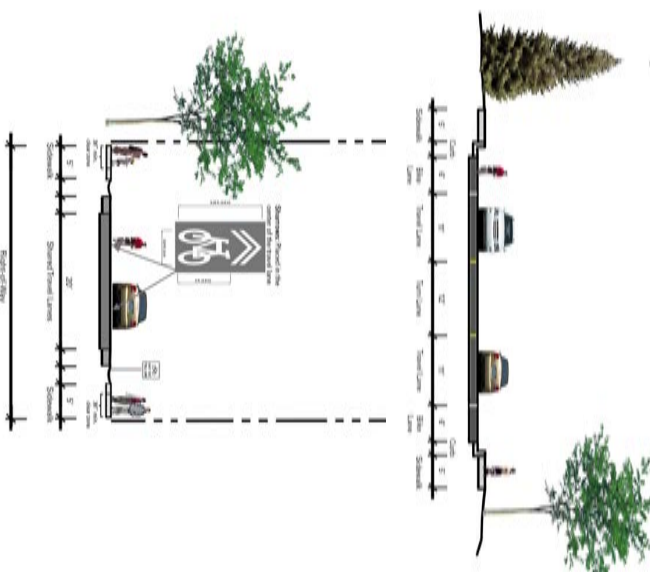


Figure 21:  
Example Road Diet & Shared Lane Markings (Sharrow)



Shared Lane Markings

Photo by: Greg Ralsman, xx

## Resources

- Manual on Uniform Traffic Control Devices, 2009 (US Department of Transportation): <http://www.fhwa.dot.gov/publications/2009/09112/>
- Guide for the Development of Bicycle Facilities, Fourth Edition (American Association of State Highway and Transportation Officials): 4.4 Marked Shared Lanes
- Urban Bikeway Design Guide, Second Edition (National Association of City Transportation Officials): <http://nacto.org/cities-for-cycling/design-guide/bikeway-signing-marking/shared-lane-markings/>

## Shared Use Path

### What

Shared use paths are for people walking, bicycling, skating, or using other forms of nonmotorized transportation. Paths can be in a separated right-of-way, such as Grant's Trail, or adjacent to a roadway.

### Why

Shared use paths create dedicated space for pedestrians and bicyclists. Shared use paths complement the on-street system by providing connectivity to destinations and sense of buildings or other destinations to increase safety for many users.

### When

Shared use paths can be used to provide convenient access to destinations, such as parks and schools. Paths can be popular recreation destinations as well. However, acquiring the right-of-way and funding needed for paths can be quite challenging.

### How

The design of the path should be based on the expected users and should be compliant with the Americans with Disabilities Act (ADA). For paths that are adjacent to a roadway, the path can follow the slope of the roadway. Trail crossing signs (MUTCD W11-15 and W11-15p) should be used in advance of all intersections. The Guide for the Development of Bicycle Facilities, Fourth Edition (AASHTO) provides a detailed engineering guide for the construction of paths.

### Using the street

Motorists must watch for through traffic coming from the left and right when making turns.

Pedestrians have the right of way, but should be aware of bicyclists. They must be careful when crossing streets and driveways.

Bicyclists must yield to pedestrians and give audible signal when passing. They must be careful when crossing streets and driveways.

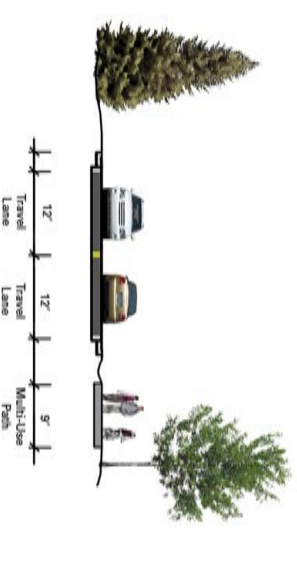


Figure 22 : Example Multi-Use Path



Shared Use Path



*Kirkwood has an extensive network of sidewalks, but utilities and trash receptacles can block the sidewalks.*



*Sidewalks support foot traffic in Kirkwood's vibrant downtown.*



*Sidewalks and ramps make it easier to families to travel safely.*

## Sidewalks

### What

Sidewalks are elevated from the roadway by several inches, separated from the street by a curb, and made of concrete.

### Why

Sidewalks improve safety and comfort for pedestrians.

### When

Sidewalks give pedestrians safe and comfortable space on virtually any roadway.

### How

Sidewalks should be a minimum of 5' wide. Street furniture or light posts should be placed to preserve at least a 48" continuous through path. Each intersection should have a sidewalk ramp (see ADA guidelines for more information). When possible, sidewalks should be on both sides of the street. If it is only possible to provide sidewalks on one side of the street, it is important to ensure that the sidewalk is provided on the same side along the length of the street. Every time a pedestrian crosses the street, it increases the chances of a crash.

### Resources

- Urban Street Design Guide (National Association of City Transportation Officials): <http://nacto.org/usdg/street-design-elements/sidewalks/>

## Traffic calming

Traffic calming can improve safety, reduce noise in neighborhood streets, and enhance walking and biking friendliness when there is not enough right-of-way to add separate facilities. During public meetings, and through the public survey, several residents reported that they felt drivers were speeding on neighborhood streets. The perception that people are driving dangerously fast on local streets can prevent people from walking or biking for transportation or recreation.

Well-designed traffic calming should be implemented as the last step in a phased approach to lowering speeds on neighborhood streets. The following process outlines steps that should be taken before considering traffic calming:

- 1. Establish need:** If residents perceive speeding on their streets, the first step is to establish that drivers are exceeding the speed limit. Speed should be monitored during peak hours and off-peak hours to determine if speeds exceed the speed limit, and by how much.
- 2. Speed monitor trailer:** If speeding is determined to be a problem, the City should place their speed monitor trailer along the street, in order to raise awareness of speeding behavior. The trailers allow drivers to monitor their own speed and self-correct. The speed monitor can be placed on the street for as long as the City and the neighbors feel it is appropriate. Three

months after the speed trailer is removed, speeds should be monitored to determine if the trailer had a lasting effect.

- 3. Neighborhood efforts:** If speeding persists on the street, the City should encourage residents to raise awareness of speeding issues by placing signs in their yards asking drivers to slow down. Ready-made signs can be purchased if the neighborhood wants a uniform look. However, homemade signs can offer more variety and may slow traffic more effectively by increasing intrigue, as drivers slow to look at the individual signs. Again, speeds should be monitored three months after the signs were installed to determine if they have had a lasting effect.

- 4. Spot enforcement:** If speeding persists, an officer should monitor speeds on the street, and issue warnings or tickets as necessary. Speeds should be monitored three months after the spot enforcement activities in order to determine if they have had a lasting effect.

- 5. Traffic calming:** If the previous steps have not had a lasting impact in reducing speeds, physical traffic calming should be considered. Traffic calming generally works to slow speeds by diverting drivers from a straight line of travel, either horizontally (like speed tables) or vertically (like an extra curve). This guide will list a number of possible traffic calming techniques that can be used. Many communities have



*This bumpout in front of the Kirkwood Library helps to narrow the roadway and calm traffic.*



*Speed cushions for designed for emergency vehicle access  
Photo by: Dan Burden, [www.pedbikeimages.org](http://www.pedbikeimages.org)*



Miniature roundabout and curb bumpouts

Photo by: Dan Burden, [www.pedbikeimages.org](http://www.pedbikeimages.org)

funded traffic calming by combining it with green infrastructure, such as rain gardens. The Funding Sources Guide has more information on green infrastructure grants.

### Options for Traffic Calming

The following traffic calming techniques can be considered in Kirkwood on neighborhood streets if other options to reduce speeding have been exhausted. The options are listed in order of effectiveness. The first option is the lowest cost, while the cost of curb extensions or mini-roundabouts depends largely on the size and material used.

**Centerlines:** One of the simplest traffic calming approaches can be to leave streets free of centerlines unless they are warranted. When centerlines are not present, drivers tend view the street as shared space, and slow down in order to be able to negotiate with oncoming traffic. As drivers often hesitate to cross centerlines when passing people on bicycles, streets without centerlines can be more bicycle-friendly as well. Currently, Kirkwood has many residential streets without centerlines that function well.

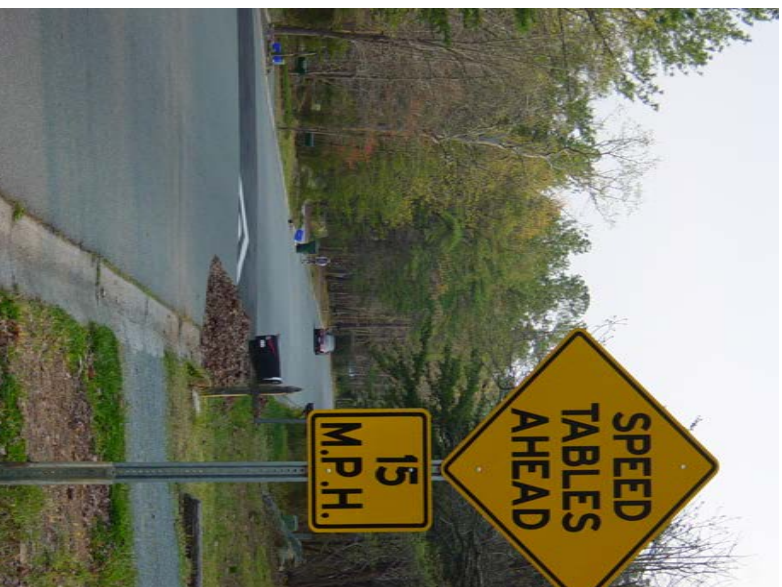
When streets are scheduled for resurfacing, it creates the opportunity to evaluate if streets meet the warrant for centerline striping. The MUTCD establishes that centerline markings shall be placed on streets with an Average Daily Traffic (ADT) of 6,000 or greater (Section 3B.01). For collectors with less than 6,000 ADT and a traveled way of 20' or more, centerlines may not be necessary.

**Curb extensions:** Kirkwood has curb extensions in the downtown area. These curb extensions help to slow traffic, by narrowing driving lanes, and encouraging drivers to slow down in order to negotiate the tighter lanes. Curb extensions can also shorten pedestrian crossing distance and increase visibility of pedestrians crossing the street. Curb extensions can take multiple forms, from the bulb-outs used in Kirkwood, to a simple extension that tightens the curb radii, in order to discourage fast turning movements.

**Mini Roundabout:** Mini Roundabouts are often used to enhance the aesthetics of a neighborhood, in addition to traffic calming. Mini roundabouts require drivers to turn out slightly out of a straight path of travel, thereby slowing. Unlike full-size roundabouts, they do not require additional right-of-way. A mini roundabout, typically with planters or a rain garden, is placed in the middle of the intersection. Traffic circulates through the intersection in one lane, and yields upon entry to the intersection. Mini-roundabouts can reduce crashes and slow speeds on local streets.

### Resources

- The City of Alameda, summary of centerline removal approaches: <http://www.acgov.org/pwa/programs/traffic/measures.htm#1A>
- The Urban Street Design Guide
  - <http://nacto.org/usdg/intersections/minor-intersections/mini-roundabout/>
  - <http://nacto.org/usdg/street-design-elements/curb-extensions/>



Speed tables are an effective and low cost traffic calming solution. Photo by: Austin Brown, [www.pedbikeimages.org](http://www.pedbikeimages.org)

## Evaluation and Implementation

Evaluation is an essential part of planning, as it allows the City to see if the recommendations are achieving the desired goals, and make changes as needed. The evaluation and implementation process starts as part of the planning process, and the following recommendations have been integrated into the planning work.

### Annual bike walk counts

Biking and walking counts are an annual inventory of how many people are using active transportation in the community and can track progress over time. The national American Community Survey contains some data on transportation, but it is infrequent and the margin of error increases in communities with smaller populations. The National Project for Bicycle and Pedestrian Documentation coordinates an annual nation wide count. The methodology has been designed to be easy for volunteers to use. Counting locations and protocol for Kirkwood will be created as part of the planning process.

### Walk and bike audits

Both a walk audit and bike audit were conducted with City staff as part of the planning process. The staff was provided with walk and bike audit tools in order to perform audits before any planned street

work. The purpose of the audits are to look for opportunities to improve walking and/or biking access along streets.

### Designate a bicycle and pedestrian coordinator on City staff

The bicycle and pedestrian coordinator serves as the central point for coordinating information about bicycling and walking, especially in regards to implementation of the plan. The main staff contact for coordinating the planning process should remain the main staff contact for implementation. Coordination duties for a plan of this size are estimated to take approximately 10 hours per month, which would not justify additional staff. The coordinator will perform the following tasks:

- Be prepared to be the go-to person for biking and walking questions within the community
- Monitor Local Government Briefings for regional and federal grant opportunities, check for potential projects and submit applications as appropriate
- Monitor street maintenance and repair; when streets are scheduled for repaving, look for opportunities to implement plan
- When Saint Louis County or MoDOT facilities within the City bounds are set for repaving, contact the appropriate agency to see how plan can be implemented during the restriping process

### Seek Bicycle Friendly Community and

### Walking Friendly Community status

The Bicycle Friendly and Walk Friendly program are free and help the communities receive national and regional attention for their achievements. Both programs honor cities with different levels of awards: Bronze, Silver, Gold, or Platinum, and honorable mentions. The Bicycle Friendly program has recently introduced Diamond level as the highest level possible. The programs are designed to be easy to use for the communities, with comprehensive websites and online applications. Feedback is tailored to help communities identify the most important steps to take to advance rankings.

To apply for a Bicycle or Walk Friendly Designation, the bicycle and pedestrian coordinator should:

- Review the application online, and decide which objectives need to be completed before the community will be ready to go for bronze
- When the community is ready, the bicycle and pedestrian coordinator will complete and submit the application.

### Updates to City Code

Updating the City Code to be supportive of all modes of transportation will help the City of Kirkwood to implement the recommendations in the plan and to ensure that street design and law enforcement are supportive of walking

and biking. The plan recommends considering revisiting the following provisions in the Kirkwood City Code.

The Kirkwood City Code includes an entire section devoted to bicycles, Chapter 4 1/2. The Code differs from Missouri State Law in two ways:

1. The requirements for retroreflective material on the pedals and wheels of a bicycle are much more specific than those of the Missouri State Statutes. Currently the Kirkwood City Code requires reflectors on both sides of the pedals in addition to reflectors on both the rims and spokes of both sides of bicycle tires ( Section 4 ½ - 3 P. 4).

While it would be ideal for all bicyclists to have such reflectors, it may be easier to enforce a law that follows the Missouri States Statutes, which require reflectors on moving parts, but do not specify color, location, and size with such detail.

2. The City Code requires bicyclists to use paths adjacent to streets or highways when they have been officially designated (4 ½ - 5). Typically, bicyclists do use the paths, when they are available.

Similar laws across the country have been controversial, as they can be difficult to interpret and enforce, especially if there is glass, standing water, driveways, parked cars, or some other hazards for cyclists in or near the designated path.

Updating these two ordinances will bring Kirkwood's laws in line with those of the state of Missouri and many surrounding communities. This will reduce confusion when the laws are enforced.

### Complete Streets

The City Council should consider Complete Streets for the City of Kirkwood. A Complete Streets policy ensures that all modes of transportation are considered equally when transportation decisions are made. Enacting Complete Streets does not require additional funding, instead it works to shift priorities so that existing funds are spent in a way that addresses a wider variety of transportation needs. Several municipalities in the region and St. Louis County have a Complete Streets policy that can serve as the basis for the City of Kirkwood. In 2012, Clayton's Complete Streets policy was selected as one of the ten best policies in the United States.

### Resources

- The League of American Bicyclists report on the importance of bicycle and pedestrian staff in communities:  
[http://www.advocacyadvance.org/site\\_images/content/why\\_bike\\_ped\\_staff\\_april\\_2010.pdf](http://www.advocacyadvance.org/site_images/content/why_bike_ped_staff_april_2010.pdf)
- League of American Bicyclists Bicycle Friendly Program: <http://www.bikeleague.org/content/communities>
- Walk Friendly Communities: <http://www.walkfriendly.org/>
- The National Complete Streets Coalition, including sample policies, available: <http://www.smartgrowthamerica.org/complete-streets>



## Pre-Engineering Opinion of Pedestrian Facilities Cost

The following information provides a general opinion of probable construction costs for the recommended pedestrian facilities. Costs are based on conceptual design evaluation of the facilities and pre-engineering design development. The unit cost numbers are based on cost data in Trainet's Streets For Everyone (2013) and FHWA's Costs for Pedestrian and Bicyclist Infrastructure Improvements (2013). The costs were adjusted for inflation to reflect the year 2016 construction market. They are subject to traditional market place fluctuations.

The following costs estimates are based on adding curb and sidewalk to identified sidewalk gaps. They do not include an estimate of land acquisition, due to the high variability of costs. The cost estimates also include the costs associated with replacing all the sidewalks along recommended walking routes to meet ADA compliance. Many of these priority corridors already have full or partial sidewalks, at least along one side. As the scope of the project did not include a detailed, sidewalk assessment, this cost estimate is based on the worst-case scenario. The engineering phase of any sidewalk project should start by inspecting the sidewalk for ADA compliance.

Finally, the railroad crossing at Fillmore and the Grant's Trail extension calls for a detailed engineering feasibility study in order to produce a credible cost estimate. Pedestrian bridges over railroads can range from \$1 million to

several million, based on design, width, and right-of-way constraints. The Grant's Trail extension is based on cost estimates from national and local sources, however every site is unique and will require detailed engineering estimates.

Figure 23: Cost Estimates of Pedestrian Facilities

Infrastructure Type	Description	Cost	Cost Unit
Pedestrian	Crosswalk	\$3,3000	each
Pedestrian	Curb Ramp	\$800	each
Pedestrian	Sidewalk + curb	\$952,300	mile
Pedestrian	Pedestrian Route with crosswalks and signage	\$61,500	mile
Pedestrian	Crossing Island	\$11,100	each
Pedestrian	Ped/bike push button	\$300	each
Pedestrian	Raised Crossing	\$7,600	each
Pedestrian	Pedestrian Plaza	\$25,000	each
Traffic Calming	Traffic circle	\$28,900	each
Traffic Calming	Curb extension	\$10,800	each
Traffic Calming	Speed table	\$2,300	each

Figure 24: Pedestrian Recommendations

Recommendation	Cost Estimate	Length (mi)
High priority sidewalk gaps	\$1,018,400	1.1
Additional sidewalks to complete one side network	\$4,769,800	5.0
Sidewalks needed to complete two sided network	\$21,215,600	22.3
Paths, connections, lane diets, and road diets.	\$2,385,600	3.2
<b>Total:</b>	<b>\$29,389,400</b>	<b>31.6</b>

\* All cost estimates based on Cost for Pedestrian and Bicyclist Infrastructure

Figure 25: Cost Estimates of Sidewalks with Gaps in Recommended Network (Listed in order of Priority)

Streets	Recommendation	Length (mi)	Cost Estimate (sidewalks per side)
Kirkwood	Sidewalk	0.10	\$92,600
Manchester	Sidewalk	0.08	\$77,300
Big Bend	Sidewalk	0.35	\$336,000
Jefferson	Sidewalk	0.07	\$64,400
Fillmore south of railroad tracks	Sidewalk	0.08	\$76,300
Fillmore at Madison	Sidewalk	0.07	\$70,100
Ballas	Sidewalk	0.32	\$301,700
Essex	Sidewalk	0.17	\$159,100
Longview	Sidewalk	0.45	\$429,400
Clark	Sidewalk	0.07	\$69,100
Milwaukee	Sidewalk	0.09	\$83,400
Van Buren	Sidewalk	0.13	\$122,000
Madison	Sidewalk	0.57	\$546,900
Southbrook	Sidewalk	0.10	\$91,500
Timberbrook	Sidewalk	0.10	\$91,800
Monroe	Sidewalk	0.38	\$358,600
Rifle Range	Sidewalk	0.27	\$261,200
Bodley	Sidewalk	0.27	\$260,800
Brownell	Sidewalk	0.37	\$354,800
Wilson	Sidewalk	0.34	\$326,700
Lindeman	Sidewalk	0.37	\$354,100
Glenwood	Sidewalk	0.59	\$560,900
Highland	Sidewalk	0.73	\$699,500
<b>Total</b>		<b>6.08</b>	<b>\$5,788,200</b>

Figure 26: Cost Estimates for Sidewalks with One Side Sidewalk (Listed in order of Priority)

Streets	Recommendation	Length (mi)	Cost Estimate (to add sidewalks on second side)
Kirkwood	Sidewalk	0.32	\$309,100
Big Bend	Sidewalk	0.51	\$487,400
Geyer	Sidewalk	0.61	\$578,900
Manchester	Sidewalk	0.64	\$608,300
Adams	Sidewalk	0.32	\$305,400
Ballas	Sidewalk	2.09	\$1,994,000
Couch	Sidewalk	0.31	\$290,700
Dougherty Ferry between Ballas and Geyer	Sidewalk	0.81	\$775,100
Dougherty Ferry at i-270	Sidewalk	0.25	\$237,000
Rose Hill east of Kirkwood	Sidewalk	0.26	\$247,400
Rose Hill at Couch	Sidewalk	0.13	\$123,300
Essex at Dougherty Ferry	Sidewalk	0.42	\$404,000
Essex east of Woodlawn	Sidewalk	0.16	\$151,300
Woodlawn	Sidewalk	0.25	\$239,400
Clay	Sidewalk	0.10	\$94,200
Craig	Sidewalk	0.34	\$322,700
Jefferson	Sidewalk	0.39	\$370,500
Peeke	Sidewalk	0.15	\$139,500
Harrison south of Essex	Sidewalk	0.15	\$139,000
Harrison north of Monroe	Sidewalk	0.09	\$81,800
Harrison south of Woodbine	Sidewalk	0.18	\$175,500
Madison	Sidewalk	0.13	\$119,800
Taylor	Sidewalk	0.19	\$183,100
Fillmore	Sidewalk	0.44	\$422,100
Scott	Sidewalk	0.05	\$45,400

Cont. on next pg.

Figure 26 cont.: Cost Estimates for Sidewalks with One Side Sidewalk (Listed in order of Priority)

Streets	Recommendation	Length (mi)	Cost Estimate (to add sidewalks on second side)
Argonne	Sidewalk	0.31	\$292,200
Monroe	Sidewalk	0.43	\$411,700
Washington	Sidewalk	0.13	\$121,800
Meacham	Sidewalk	0.11	\$106,900
Memphis	Sidewalk	0.12	\$115,500
Orleans north of Memphis	Sidewalk	0.05	\$43,800
Orleans south of Attucks	Sidewalk	0.09	\$86,800
Van Buren	Sidewalk	0.26	\$247,800
Alsbrook	Sidewalk	0.24	\$224,900
Attucks	Sidewalk	0.12	\$114,700
Bodley	Sidewalk	0.18	\$172,700
Milwaukee	Sidewalk	0.14	\$129,800
Tolstoi	Sidewalk	0.09	\$83,900
Lindeman	Sidewalk	0.70	\$667,000
Ann	Sidewalk	0.38	\$361,500
Dickson	Sidewalk	0.92	\$878,200
Dickson	Sidewalk	0.09	\$88,500
Holmes	Sidewalk	1.09	\$1,038,600
Lockett	Sidewalk	0.43	\$409,500
Quan	Sidewalk	0.26	\$248,500
Scottsdale	Sidewalk	0.09	\$86,400
Timberbrook	Sidewalk	0.52	\$491,300
Wilson	Sidewalk	0.17	\$160,100
<b>Total: (to add to streets that currently have sidewalks on one side)</b>		<b>16.20</b>	<b>\$15,427,400</b>
<b>Total: (for entire recommended net-work to have sidewalks on both sides)</b>		<b>21.82</b>	<b>\$20,786,200</b>

Figure 27: Cost Estimates for other connections (Listed in order of Priority)

Streets	Recommendation	Length (mi)	Cost Estimate
Fillmore	Ped Rail Crossing	0.03	\$292,200
Kirkwood	Road Diet / On-Street Parking	1.28	\$411,700
Marshall	Meramec Greenway Connection	0.06	\$121,800
Ballas	Restriped Shoulder	0.45	\$106,900
Adams	Restriped Shoulder	1.41	\$115,500
<b>Total:</b>		<b>3.24</b>	<b>\$2,385,600</b>

**Figure 28: Cost Estimates for Bicycle Facilities**

Infrastructure Type	Description	Cost	Cost Unit
Bicycles	Bicycle lane	\$95,000	mile
Bicycles	Buffered Bicycle Lane*	\$122,100	mile
Bicycles	Signed route	\$28,900	mile
Bicycles	Shared lane markings	\$200	each
Bicycles	Signed route with SLM every 250 ft	\$32,500	mile
Bicycles	Shared use path	\$276,900	mile
Bicycles	Neighborhood Greenway*	\$137,300	mile
Traffic Calming	Traffic Circle	\$28,900	each
Traffic Calming	Curb extension	\$10,800	each
Traffic Calming	Speed table	\$2,300	each

**Figure 29: Bicycle Recommendations**

Recommendation	Cost Estimate	Length (mi)
Phase 1	\$930,900	10.8
Phase 2	\$1,148,200	9.3
Phase 3	\$530,200	4.1
As Feasible	\$1,026,800	10.5
Grants Trail Connection	\$471,700	0.7
<b>Total:</b>	<b>\$4,107,800</b>	<b>35.3</b>

All cost estimates based on Cost for Pedestrian and Bicyclist Infrastructure

\* Cost estimate based on Streets For Everyone (Trailnet, 2014)

## Pre-Engineering Opinion of Bicycle Facilities Cost

The following information provides a general opinion of probable construction costs for the recommended bicycle facilities in the Kirkwood Pedestrian and Bicycle Master Plan. See Page 54 for a description of the sources used in the cost estimates.

For corridors marked “As Feasible,” several of the changes could come through restriping during routine mill and overlay. The cost is calculated based on painting the street after a routine mill and overlay and does not include the cost of grinding out the existing striping pattern, as grinding out existing lanes for changes is not recommended by the plan.

Figure 30: Cost Estimates for Bicycle Facilities (Listed in order of Priority)

Corridor	Recommended Facility	Length (mi)	Phase	Cost Estimate (per mile)	Total Cost Estimate
Dougherty Ferry	Bike Lane	1.73	Phase 1	\$95,000	\$164,100
Fillmore	Neighborhood Greenway	0.41	Phase 1	\$137,300	\$56,300
Fillmore	Neighborhood Greenway	0.60	Phase 1	\$137,300	\$82,800
Geyer	Shared Lane Marking	3.26	Phase 1	\$5,280	\$17,200
Glenwood	Neighborhood Greenway	0.77	Phase 1	\$137,300	\$106,100
Highland	Neighborhood Greenway	0.72	Phase 1	\$137,300	\$99,000
Holmes	Shared Lane Marking	0.36	Phase 1	\$5,280	\$2,000
Monroe	Neighborhood Greenway	0.24	Phase 1	\$137,300	\$32,700
Rose Hill	Neighborhood Greenway	0.74	Phase 1	\$137,300	\$102,200
Rose Hill	Neighborhood Greenway	0.75	Phase 1	\$137,300	\$103,100
Scott	Neighborhood Greenway	0.32	Phase 1	\$137,300	\$44,300
Timberbrook	Neighborhood Greenway	0.43	Phase 1	\$137,300	\$59,300
Woodlawn	Neighborhood Greenway	0.45	Phase 1	\$137,300	\$61,800
	<b>Total Phase 1:</b>	<b>10.79</b>			
Ann	Neighborhood Greenway	0.51	Phase 2	\$137,300	\$70,700
Ballas	Shared Lane Marking	0.93	Phase 2	\$5,280	\$5,000
Couch	Neighborhood Greenway	1.09	Phase 2	\$137,300	\$150,300
Essex	Neighborhood Greenway	1.47	Phase 2	\$137,300	\$202,100
Harrison	Neighborhood Greenway	2.02	Phase 2	\$137,300	\$277,200
Longview	Neighborhood Greenway	0.45	Phase 2	\$137,300	\$61,800
Taylor	Neighborhood Greenway	0.12	Phase 2	\$137,300	\$16,100
Woodbine	Neighborhood Greenway	1.26	Phase 2	\$137,300	\$173,200
Woodlawn	Neighborhood Greenway	1.40	Phase 2	\$137,300	\$191,800
	<b>Total Phase 2:</b>	<b>9.26</b>			\$1,148,200

Corridor	Recommended Facility	Length (mi)	Phase	Cost Estimate (per mile)	Total Cost Estimate
Argonne	Neighborhood Greenway	0.37	Phase 3	\$137,300	\$51,000
Argonne	Bike Lane	0.63	Phase 3	95,000	\$60,200
Lindeman	Neighborhood Greenway	1.34	Phase 3	137,300	\$184,500
Taylor	Neighborhood Greenway	1.71	Phase 3	\$137,300	\$234,500
	<b>Total As Phase 3:</b>	<b>4.06</b>			<b>\$530,200</b>
Adams	Lane Diet	1.45	as Feasible	\$95,000	\$137,500
Adams	Shared Lane Marking	0.74	as Feasible	\$5,280	\$4,000
Adams	Bike Lane	0.58	as Feasible	\$95,000	\$54,900
Ballas	Lane Diet	0.49	as Feasible	\$95,000	\$47,000
Ballas	Bike Lane w/ Road Diet	1.38	as Feasible	\$95,000	\$130,800
Big Bend	Bike Lane w/ Road Diet	2.74	as Feasible	\$95,000	\$260,400
Manchester	Bike Lane	3.05	as Feasible	\$95,000	\$289,400
Connection to Meramec Greenway	Shared Use Path	0.07	as Feasible	\$1,500,000	\$102,800
	<b>Total As Feasible:</b>	<b>10.49</b>			<b>\$1,026,800</b>
Elliot	Neighborhood Greenway	0.41	Phase 2	\$137,300	\$56,700
Planned Connection	Shared Use Path	0.28	Phase 2	\$1,500,000	\$415,000
	<b>Total Connection:</b>	<b>0.69</b>			<b>\$471,700</b>
	<b>Total for recommended improvements</b>				<b>\$4,107,800</b>

## Funding Sources

Bicycle and pedestrian improvements can be funded through a variety of federal and local sources. Federal funds are well suited to higher cost infrastructure projects, such as sidewalks or the Grant's Trail Extension. Improvements that involve mainly paint, such as Shared Lane Markings, could be implemented through routine maintenance, set-aside funds, or grouped as one federal funding application. The City of Kirkwood should plan for the cost of ongoing maintenance for maintenance and paint, as grants for maintenance are rare.

### Federal funding sources

The current transportation bill, Moving Ahead for Progress in the 21st Century, MAP-21, has since been extended through May 31, 2015. It is possible that a new funding bill will replace MAP-21, instituting new rules for funding. It is reasonable to expect that many of the same funding opportunities will exist under a new transportation bill, however the names or performance measures may change slightly. In addition to funding sources through Map-21, there are other federal funding options. Federal funding sources are described below in more detail, including contact information for each source.

### Federal funding opportunities administered by East West Gateway Council of Governments

As part of the Transportation Improvement

Plan, East West Gateway Council of Governments (East West Gateway), administers several federal transportation funds. The programs are described below.

#### *Congestion Mitigation and Air Quality Improvement Program (CMAQ)*

The CMAQ Program is a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Projects eligible for CMAQ include walking and biking transportation infrastructure and programs encouraging walking and biking. In order to apply for the funding, an agency must demonstrate a project's impact on emissions. Applications are made available in December and are due in February on an annual basis.

#### *Surface Transportation Program (STP)*

The Surface Transportation Program provides flexible funding that may be used by States and localities for projects to preserve or improve conditions and performance on any Federal-aid highway, bridge projects on any public road, facilities for nonmotorized transportation, transit capital projects and public bus terminals and facilities. The funds can be used for walking and biking infrastructure, including on local roads. Applications are made available in December and are due in February on an annual basis.

- <http://www.ewgateway.org/TIPAppInfo/tipappinfo.htm>

- <http://www.fhwa.dot.gov/map21/stp.cfm>
- #### *Transportation Alternatives Program (TAP)*

The Transportation Alternatives Program is a new funding program under MAP-21. TAP provides for a variety of alternative transportation projects that were previously eligible activities under separately federally funded programs. This program is funded at a level equal to two percent of the total of all MAP-21 authorized Federal-aid highway and highway research funds, with the amount for each State set aside from the State's formula apportionments. Pedestrian, bicycle, trails, and safe routes to school programs are eligible for TAP funding. Specifically:

- Construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other nonmotorized forms of transportation
  - Construction, planning, and design of infrastructure-related projects and systems that will provide safe routes for non-drivers, including children, older adults, and individuals with disabilities to access daily needs
- East West Gateway typically does not have adequate funding to distribute TAP funds every year. As a round of TAP funding will be obligated in October 2015, the next round of applications for TAP funding should be expected in 2017.

- <http://www.fhwa.dot.gov/map21/tap.cfm>

- <http://ewgateway.org/TransAlternatives/transalternatives.htm>

#### *Safe Routes to School Program (SRTS)*

The SRTS Program was formerly an independent funding round focused on safe walking and bicycling to schools. With MAP 21, the program was rolled into the Transportation Alternatives Program as a potential funding category.

- <http://www.fhwa.dot.gov/map21/tap.cfm>
- <http://www.modot.org/safety/SafeRoutesToSchool.htm>

### **Federal funding opportunities administered by state and federal agencies**

#### *Highway Safety Improvement Program (HSIP)*

The HSIP emphasizes a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. Eligible projects include safety improvements for all roadway users.

- <http://www.fhwa.dot.gov/map21/hsip.cfm>

The Missouri Department of Transportation oversees the distribution of HSIP funds, with an emphasis on proactive, system wide improvements. Projects should align with Missouri's Blueprint to Arrive Alive (Strategic

Highway Safety Plan). In 2014, MODOT worked with St. Louis County to create a County-level Strategic Highway Safety Plan. The final document will include pedestrian safety improvements that align with MODOT's overall Strategic Highway Safety Plan.

- [http://epg.modot.org/index.php?title=907.1\\_Safety\\_Program\\_Guidelines](http://epg.modot.org/index.php?title=907.1_Safety_Program_Guidelines)

#### *State and Community Highway Safety Grant Program (Section 402)*

Section 402 funds are used to support State and community programs to reduce deaths and injuries. Pedestrian safety has been identified as a national priority. Section 402 funds can be used for a variety of safety initiatives including conducting data analyses, developing safety education programs, and conducting community-wide pedestrian safety campaigns. The funds must be consistent with the State Highway Safety Plan

- <http://safety.fhwa.dot.gov/policy/section402/>

- [http://epg.modot.mo.gov/index.php?title=132.4\\_Highway\\_Safety\\_Plan\\_and\\_Performance\\_Plan](http://epg.modot.mo.gov/index.php?title=132.4_Highway_Safety_Plan_and_Performance_Plan)

#### *Recreational Trails Program (RTP)*

The RTP is a program incorporated into the MAP-21, Transportation Alternatives Program. However, funding for this program is administered by the Missouri Department

of Natural Resources, a division of the State Parks. Grants are available for trail development and renovation. Projects require a minimum of a 20% local match.

- [http://www.fhwa.dot.gov/environment/recreational\\_trails/](http://www.fhwa.dot.gov/environment/recreational_trails/)
- <http://www.mostateparks.com/page/55065/outdoor-recreation-grants>

#### *Environmental Protection Agency*

The Environmental Protection Agency offers a variety of grants that address community health. Grants may help fund green infrastructure that can also be used enhance walkability and bikeability. These broad-based community grants require significant collaboration with local coalitions. Trailnet is available to partner and help with community engagement on this type of grant. As grants opportunities are always evolving, the EPA website should be checked regularly.

- <http://www.grants.gov/web/grants/view-opportunity.html?oppId=252553>

Learn more about federal funding here:

- <http://bikewalkalliance.org/resources/reports/advocacy-advance-reports/64-understanding-federal-funding-for-biking-and-walking-projects-and-programs>

## Local funding sources

Local funding for bicycle and pedestrian projects and programs is an important component when considering developing new facilities. Many federal programs require a local match, the funding sources below can be used to fund projects in full or to be used as a local match when using federal funds.

### *Local Option Economic Development Sales Taxes*

Cities in the State of Missouri have the option to impose a local sales tax of no greater than one half per cent. This sales tax can be used to fund projects including pedestrian improvements related to stormwater management (sidewalks, curbs, gutters, etc.)

### *Capital Improvement Budget Set-Aside*

Kirkwood could make a policy decision to set-aside a percentage of capital improvement budget to fund bicycle and pedestrian projects. These projects could be incorporated into other road work being done (complete streets) or stand-alone projects. These funds can be leveraged as a local match to secure federal funds.

### *Other Local Options*

A few other local funding options including the creation of a Community Improvement or Neighborhood Improvement District or assessing development fees are also possible to fund improvements. Information on these

funding options can be found at:

- <http://www.missouridevelopment.org/community%20services/Local%20Finance%20Initiatives.html>

### **Private funding sources**

Several national and state foundations provide grants for pedestrian and bicycle projects. These grants can play a significant role in funding projects and providing match for federal funds.

#### *Bikes Belong Grant Program*

Bikes Belong is a national organization dedicated to putting more people on bikes. The organization funds multi-use trails with a strong desire to leverage federal funding.

- <http://www.bikesbelong.org/grants/>

#### *Robert Wood Johnson Foundation (RWJF)*

The RWJF offers a wide range of funding opportunities to promote healthy and active living. The website offers details on various grants and calls for proposals.

- <http://www.rwjf.org/applications/solicited/cfpelist.jsp>

Figure 31: Potentially eligible pedestrian and bicycle projects under federal highway programs

	TAP	CMAQ	STP	HSIP	RTP	SECTION 402
Bicycle lane	X	X	X	X		
Shared lane marking	X	X	X	X		
Signed bike route	X	X	X			
Shared use path	X	X	X	X		X
Sidewalks	X	X	X	X		
Crosswalks	X	X	X	X		
Signals	X	X	X	X		
Trails	X		X	X	X	
Curb cuts and ramps	X	X	X	X		
Traffic calming	X		X	X		
Bike racks	X	X	X			
Educational safety brochure			X		X	
Training		X	X			X
Technical Assistance	X	X	X			X

**Programs**  
 TAP = Transportation Alternative Program  
 CMAQ = Congestion Mitigation and Air Quality Improvement  
 STP = Surface Transportation Program  
 HSIP = Highway Safety Improvement Program  
 RTP = Recreational Trails Program  
 NHPP = National Highway Performance Program  
 Section 402 = State and Community Highway Safety Grant Program

# APPENDICES

## Analysis of Surveys

### Summary

Two community surveys were used in Kirkwood during the planning process, using different methodology in order to capture a greater variety of responses. Neither survey is representative of residents of Kirkwood. A one-page survey focused on transportation habits and community priorities was mailed with utility bills. Residents could mail in their responses, scan and email them, or hand them in directly. One hundred seventy residents responded to the mail survey.

The mail-in survey results suggested that walking and bicycling are already an integral part of transportation for Kirkwood residents responding to the survey based on these findings:

- Almost 9 out of 10 respondents reported walking at least a few times a week
- Over half of respondents would like to bike more, and 70% would like to walk more, while almost half would like to drive less.

### Transportation habits

Driving was the most frequently used form of transportation, with 83% of respondents reporting that they drive daily. Walking was also common, with about half of respondents reporting walking daily, and another 40% reporting walking a few times a week. While only 1% of respondents bicycle daily, over

one quarter of respondents report bicycling a few times a month or more. Transit was the least common form of transportation, with 63% of respondents reporting that they never use transit. The survey also asked about park usage. The majority of respondents did report visiting parks at least a few times a month, and 3% visit parks in Kirkwood daily.

### Transportation preferences

Respondents were asked if they would like to change anything in their transportation habits looking forward 10 years. Almost half (48%) indicated they would like to drive a car less, while only 5% wanted to drive more. This is in strong contrast with other modes, where 70% of respondents wanted to walk more, 55% wanted to bicycle more, and 46% wanted to take transit more. Visiting parks was the most alluring option, with 72% of respondents expressing a desire to visit parks more often, and only 1% wanting to visit less. This suggests that respondents are eager for more transportation options, this in concert with our findings from the other survey and public engagement.

### Transportation priorities

Survey respondents were asked to rank six transportation priorities for Kirkwood, using percentages. Safety was the number one priority by far, with a median score of 30%. Walking options (20%) and biking options (15%) were next the two most popular. The top three priorities are complementary in many ways, as well designed pedestrian and bicycle

	How often do you walk?	How often do you bike?	How often do you take transit?	How often do you drive a car?	How often do you visit parks in Kirkwood?
Daily	49%	1%	2%	83%	3%
A few times a week	40%	15%	1%	12%	20%
A few times a month	6%	21%	5%	1%	33%
A few times a year	1%	43%	63%	1%	42%
Never	1%	1%	1%	2%	2%
Total respondents	166	165	168	169	168

Figure A-1: Survey Summary

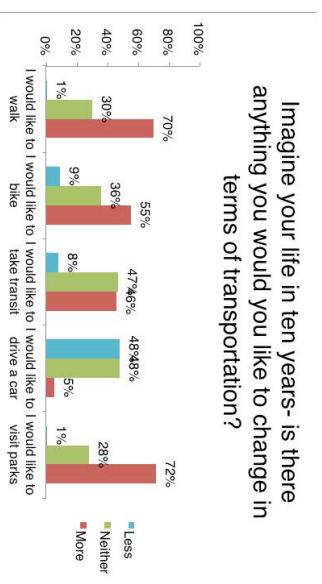


Figure A-2: Transportation Preferences

	Median	Mean	Max	Min	Standard Deviation
Making trips as safe as possible for everyone on the road	30%	36%	100	0	26.6
More walking options	20%	11%	85	0	10.9
More biking options	15%	22%	80	0	17.2
Maintaining the current transportation system	10%	16%	50	0	16.5
Keeping transportation costs in check	10%	14%	100	0	15.8
Making trips as fast as possible	5%	5%	70	0	9.6

Figure A-3: Transportation Priorities

infrastructure can reduce injury and fatal crashes across all modes by calming traffic speeds and increasing driver attentiveness. The least important priority was speed (5%), suggesting the respondents would trade a reduction in speeds for increased safety and transportation options.

### Park priorities

Finally, the survey asked about priorities for walking and biking in and near parks. Trails were by far the highest priority, with paved trails and nature trails being equally weighted with a median score of 25%. Walking routes to parks were the third highest priority, with a median value of 15%. Bike racks (10%), accessible ramps (10%), and bike racks (5%) were the least highly ranked. Each of these features are important, but generally appeal to certain groups of the population, as opposed to a trail that serves people of all ages and abilities.

### Online survey

An online survey was made available on the Kirkwood website and Trailnet website. Paper copies were also available during public outreach events. The questions focused on transportation preferences. Overall, 387 responses were received. Due to the collection method, the survey is not representative of Kirkwood residents.

### Walking environment

Overwhelmingly, respondents felt that walking in Kirkwood is safe, easy, and enjoyable. The responses in the online survey echo the sentiment that the planning team has heard throughout the outreach process- Kirkwood residents enjoy walking and they appreciate the walking opportunities in their town.

When the respondents were asked why they walk, the top three answers were recreational. At the same time, going to school, transit, and work were the least common reasons for walking. This suggests that for the respondents, walking is currently a form of recreation, rather than transportation for meeting daily needs. However, 180 of the 379 respondents reported walking to local stores, indicating that for some residents, walking is a way of getting to local destinations.

### Encouraging Walking

When asked what their barriers were to walking lack of sidewalks, uneven sidewalks, and crossing busy roads were the in the top five reasons. Lack of time and weather were also common barriers to walking. While the City of Kirkwood cannot address weather and time, improving sidewalk connectivity and crossing opportunities is feasible. When asked what changes could help them to walk more, 72% of respondents indicated more walking and biking paths, and 52% indicated more sidewalks.

Figure A-4: Park Priorities

	Median	Mean	Max	Min	Standard Deviation
Paved trails for biking and walking	25%	29.72916667	100	0	21.12766824
Nature trails for walking	25%	28.23778555	100	0	21.29257356
Walking routes to the parks	15%	17.75234742	100	0	6.42240006
Biking routes to the parks	10%	14.36374696	60	0	11.69594393
Accessible ramps	10%	10.29037879	70	0	17.69273842
Bike racks	5%	6.970149254	30	0	13.35100268

Figure A-5: Walking Environment

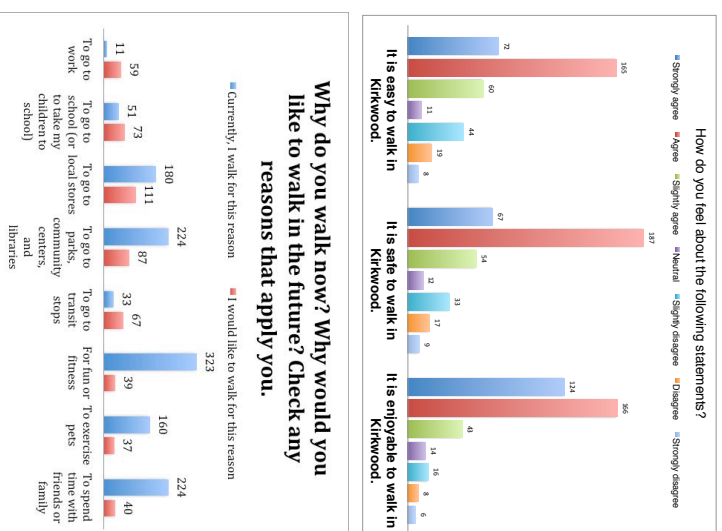


Figure A-6: Encouraging Walking

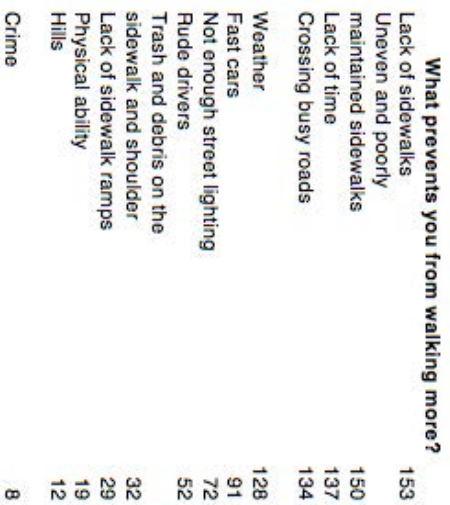
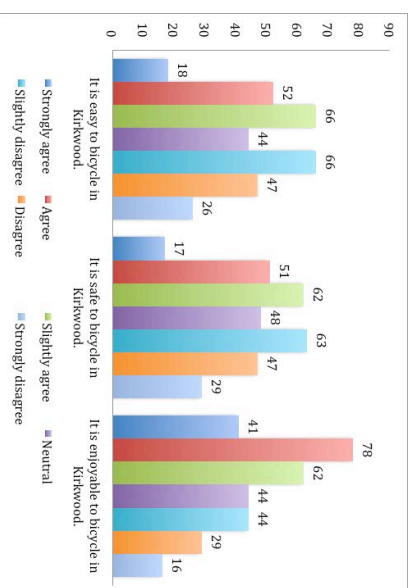


Figure A-8: Bicycling



Respondents were also asked what events and programs would be good for walking in their community. The most popular response was programs that encourage people to walk to local businesses (205 respondents) followed by community walks and fun runs (175) and programs encouraging children to walk to school (169). Each of these types of programs has been successful in similar communities, and can be considered during the planning process and beyond.

### Walking Accessories

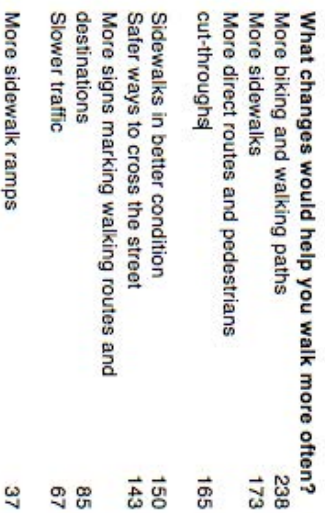
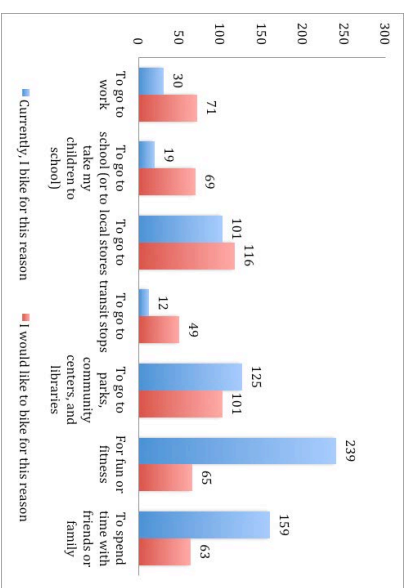
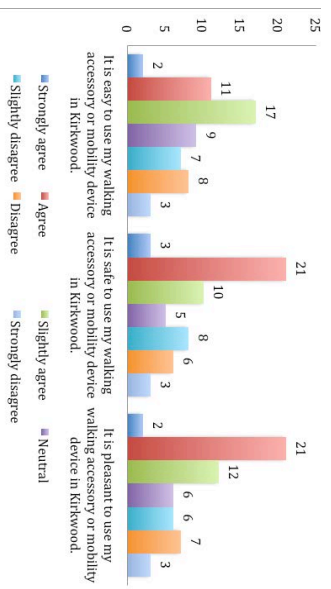


Figure A-7: Walking Accessories



Respondents were asked whether they used canes, wheelchairs, strollers, or other walking accessories and their experience using such devices. People using such devices are often a vulnerable population, including those who cannot walk without some form of assistance. Of respondents, 64 indicated using a device, and strollers were the most common accessory. Overall, the respondents slightly agreed or were neutral, that it was easy to use their walking accessories in Webster Groves. Respondents were more likely to agree that it was safe and pleasant to use their walking accessory or mobility device. Sidewalk ramps and busy roads were highlighted as problems in the open-ended questions.

### Bicycling

Compared to walking, respondents were much less likely to view bicycling as easy, safe, or enjoyable in Kirkwood. Many of Kirkwood's streets were built when walking was a primary

mode of transportation, and feature sidewalks. However, there is only one street with infrastructure where bicycles are separated from traffic.

Similar to walking, the most often cited reasons were recreational, including for fun or fitness. Again, going to local stores was a popular destination, an indication of Kirkwood's strong downtown retail sector.

### Encouraging bicycling

When asked what prevents them bicycling more now, respondents identified physical barriers, similar to the walking responses. Lack of bicycle infrastructure was the top barrier, with 193 respondents saying it prevented them from bicycling more. Lack of time and weather did not make it into the top five barriers, suggesting that physical changes would help respondents to bicycle more.

Finally, when asked where bicycle racks could help encourage bicycling, over half of respondents (104) indicated stores. Parks, community centers, and schools were all indicated by more than 30% of the respondents. Having a secure place to lock a bicycle is essential for bicycling for transportation. The survey suggests that Webster Groves does not have enough bike parking to meet demand near businesses.

These answers were echoed when respondents were asked what changes would help them to bicycle more. More biking and walking paths, and more bike lanes, were the most popular answers in the survey.

Finally, respondents were asked what events and programs would be good for bicycling in their community. Similar to walking, respondents identified community bike rides, programs that encourage people to bike to stores, and programs that encourage children to bike to school. Frequently, walking and bicycling encouragement programs are combined in schools. Bicycling encouragement programs at local stores are often times easier to administer than walking programs, as helmets offer "proof" that customers arrived by bike.

Figure A-9: Encouraging Bicycling

What prevents you from bicycling more?	
Lack of bike infrastructure	193
Crossing busy roads	164
Fast cars	155
Uneven and poorly maintained pavement	112
Rude drivers	112
Lack of time	103
Weather	103
Not sure how to bicycle on streets	46
Not enough street lighting	36
Trash and debris on the sidewalk and shoulder	33
Hills	29
Lack of ramps	26
Physical ability	12
Crime	7
What changes would help you to bicycle more often?	
More biking and walking paths	
	242
More bike lanes	
	213
More direct routes and cut-throughs for people biking and walking	
	186
More signs that show people on bikes can use the street	
	144
More signs showing biking routes and destinations	
	142
Safer ways to cross the street	
	119
Slower traffic	
	81
Education on how to bicycle on streets	
	68

## Tell us about walking and bicycling in Kirkwood!

The City of Kirkwood is partnering with Trailnet to create a Pedestrian and Bicycle Master Plan. The plan will look at how Kirkwood can improve walking and bicycling opportunities in Kirkwood over the next 10 years. You can help us make a plan that suits the community by answering this five-minute survey and returning it with your utility bill, dropping it off at City Hall (139 S. Kirkwood Rd.) or emailing your answers or a scanned copy to [info@kirkwoodmo.org](mailto:info@kirkwoodmo.org). All results will be recorded and reported anonymously.

In this survey, "walking" refers to any kind of traveling that is usually done on a sidewalk, including using a walker, a wheelchair, or any mobility device. "Biking" refers to using a bicycle, handcycle, tricycle, or recumbent.

	Daily	A few times a week	A few times a month	A few times a year	Never
How often do you walk?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you bike?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you take transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you drive a car?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you visit parks in Kirkwood?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Imagine your life in ten years - is there anything you would like to change in terms of transportation?

	Less	Neither more nor less	More
I would like to walk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would like to bike	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would like to transit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would like to drive a car	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would like to visit parks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

When it comes to transportation decisions in Kirkwood over the next ten years, what should be the highest priorities? Please use a percentage to indicate the importance of each of the following priorities. Together, the importance for all six priorities should add up to 100%.

Priority	Importance
Making trips as safe as possible for everyone on the road	%
Maintaining the current transportation system	%
More walking options	%
More biking options	%
Keeping transportation costs in check	%
Making trips as fast as possible	%

When it comes to biking and walking in Kirkwood's parks, what would you like to see more of in the next ten years? Please use a percentage to indicate the importance of each of the following priorities. Together, the importance for all six priorities should add up to 100%.

Priority	Importance
Nature trails for walking	%
Paved trails for biking and walking	%
Bike racks	%
Accessible ramps	%
Walking routes to the parks	%
Biking routes to the parks	%

What is your gender? \_\_\_\_\_

What is your age? \_\_\_\_\_

**Survey Overview**

This anonymous survey will take 10 minutes. Your answers will help Trailnet and Kirkwood understand what the community needs in the Kirkwood Pedestrian and Bicycle Master Plan.

In this survey, "walking" refers to any kind of traveling that is usually done on a sidewalk, including using a walker, a wheelchair, or any mobility device.

"Biking" refers to using a bicycle, handycycle, tricycle, or recumbent.

You will have a chance to tell us more about what "walking" and "biking" mean for you.

**Walking**

**1. How do you feel about the following statements?**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
It is easy to walk in Kirkwood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is safe to walk in Kirkwood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is enjoyable to walk in Kirkwood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**2. Why do you walk now? Why would you like to walk in the future? Check any reasons that apply you.**

	Currently, I walk for this reason	I would like to walk for this reason
To go to work	<input type="radio"/>	<input type="radio"/>
To go to school (or to take my children to school)	<input type="radio"/>	<input type="radio"/>
To go to local stores	<input type="radio"/>	<input type="radio"/>
To go to parks, community centers, and libraries	<input type="radio"/>	<input type="radio"/>
To go to transit stops	<input type="radio"/>	<input type="radio"/>
For fun or fitness	<input type="radio"/>	<input type="radio"/>
To exercise pets	<input type="radio"/>	<input type="radio"/>
To spend time with friends or family	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>

**3. What prevents you from walking more?**

- Lack of time
  - Fast cars
  - Hills
  - Lack of sidewalk ramps
  - Weather
  - Lack of sidewalks
  - Crossing busy roads
  - Not enough street lighting
  - Uneven and poorly maintained sidewalks
  - Crime
  - Rude drivers
  - Trash and debris on the sidewalk and shoulder
  - Physical ability
- Other (please specify) \_\_\_\_\_

**4. What changes would help you to walk more often?**

- More sidewalks
  - More sidewalk ramps
  - Slower traffic
  - More signs marking walking routes and destinations
  - Sidewalks in better condition
  - Safer ways to cross the street
  - More biking and walking paths
  - More direct routes and pedestrian cut-throughs
- Other (please specify) \_\_\_\_\_

**5. Please share any streets that are particularly difficult to walk on.**

**6. Please check the events and programs that would be good for walking in your community.**

- Community walks and fun runs
  - Programs that encourage children to walk to school
  - Neighborhood walking groups
  - Programs that encourage people to walk to local businesses
  - Greater police enforcement of transportation laws
- Other (please specify) \_\_\_\_\_

**\* 7. When you are walking, do you use any accessories or mobility devices, such as a stroller, a cane, a wheeled cart, a walker, a wheelchair, or an electronic mobility cart?**

- Yes  No

**Walking Accessories**

**\* 8. Please tell us what kind of accessories you use, and whether you use them everyday, or just sometimes.**

\_\_\_\_\_

**9.**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
It is easy to use my walking accessory or mobility device in Kirkwood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is safe to use my walking accessory or mobility device in Kirkwood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is pleasant to use my walking accessory or mobility device in Kirkwood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**10. If you use multiple walking accessories or mobility devices, please tell us about your experience using the accessories in Kirkwood.**

\_\_\_\_\_

**Bicycling**

**\* 11. When it comes to bicycling, how would you describe yourself?**

- Strong and fearless- I feel comfortable riding my bicycle on ANY road, even in heavy traffic.
- Enthusiased and confident- I feel comfortable riding my bicycle in most situations, but I avoid roads with lots of fast cars.
- Interested but concerned- If I ride, it is mostly on trails or very quiet streets. I would like to ride more, but it feels dangerous.
- No way, no how- I have no interest in riding a bicycle.

**Bicycling**

**12. How do you feel about the following statements?**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
It is easy to bicycle in Kirkwood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is safe to bicycle in Kirkwood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is enjoyable to bicycle in Kirkwood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**13. What kinds of bicycles do you and your family ride?**

- Adult bicycles  Child bicycles or triycles
- Recumbents or handcycles  Adult tricycles

Other (please specify) \_\_\_\_\_

**14. Why do you bicycle now? Why would you like to bike in the future? Check any reasons that apply you.**

	Currently, I bike for this reason	I would like to bike for this reason
To go to work	<input type="radio"/>	<input type="radio"/>
To go to school (or to take my children to school)	<input type="radio"/>	<input type="radio"/>
To go to local stores	<input type="radio"/>	<input type="radio"/>
To go to transit stops	<input type="radio"/>	<input type="radio"/>
To go to parks, community centers, and libraries	<input type="radio"/>	<input type="radio"/>
For fun or fitness	<input type="radio"/>	<input type="radio"/>
To spend time with friends or family	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>

**15. What prevents you from bicycling more?**

- Lack of time  Physical ability
  - Hills  Fast cars
  - Weather  Lack of ramps
  - Not sure how to bicycle on streets  Lack of bike infrastructure
  - Crossing busy roads  Not enough street lighting
  - Uneven and poorly maintained pavement  Crime
  - Ride drivers  Trash and debris on the sidewalk and shoulder
- Other (please specify) \_\_\_\_\_

**16. What changes would help you to bicycle more often?**

More bike lanes

More biking and walking paths

Slower traffic

More signs that show people on bikes can use the street

More signs showing biking routes and destinations

Safer ways to cross the street

More direct routes and out-througths for people biking and walking

Education on how to bicycle on streets

Other (please specify) \_\_\_\_\_

**17. Please share any streets that are particularly difficult to bicycle on.**

\_\_\_\_\_

**18. Please check the events and programs that would be good for bicycling in your community.**

Bicycle classes for adults  Greater police enforcement of transportation laws

Bicycle classes for children  Programs that encourage children to bike to school

Community bike rides  Programs that encourage people to bike to local businesses

Other (please specify) \_\_\_\_\_

**19. Where in your community could bicycle racks help people to bicycle more?**

Schools  Community centers

Stores  Parks

Transit stops

Other (please specify) \_\_\_\_\_

**20. What is your age?**

Under 18  19 - 34  35 - 49  50 - 64  65 and older

**21. What is your gender?**

\_\_\_\_\_

**22. What is your ethnicity?**

\_\_\_\_\_

**23. If you would like to receive updates about the Pedestrian and Bicycle master planning process, including upcoming events and activities, please provide your contact information below. All survey answers will be confidential.**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Address 2: \_\_\_\_\_

City/Town: \_\_\_\_\_

State: \_\_\_\_\_

ZIP: \_\_\_\_\_

Country: \_\_\_\_\_

Email Address: \_\_\_\_\_

**\*24. Would you like to be included in future email updates about bicycling and walking in the region?**

Yes  No

Planning Advisory Committee  
 Meeting #1: April 28, 2014  
 Draft Summary Notes

**Location:** Kirkwood Recreation Center

**Attendees:**

Name	Affiliation
Steve Coates	Kirkwood Park Board
David Eagleton	Kirkwood Resident
Alan Hopefl	Kirkwood Park Board
Nancy Luetzow	Kirkwood Council
Madt Mallinckrodt	Kirkwood Planning and Zoning Commission
Donna Muellner	Kirkwood Resident
Ryan Moore	Kirkwood Resident
James Myers	Kirkwood resident/ Board of Adjustment
Robert Trottmann	Kirkwood Resident
Frank Wentz	Kirkwood Resident
Bill Bensing	City of Kirkwood Public Services
Murray Pounds	City of Kirkwood Parks and Recreation
Ryan Spencer	City of Kirkwood Zoning
Carey Bundy	Great Rivers Greenway
Kim Fitzgerald	St. Louis Community College – Meramec
Tobi Moriarty	St. Louis County Highways and Traffic
Michelle Voegelé	MODOT Area Engineer
Marielle Brown Trailnet	
Cindy Mense	Trailnet

**Summary:**

The Honorable Art McDonnell, Mayor of Kirkwood, opened the meeting and welcomed the committee members. After introductions from the committee members, Marielle Brown, Trailnet Transportation Planning

Manager, led a presentation on the planning process and the public engagement strategy.

The presentation began with a discussion on what makes a place walkable and bikeable. The committee mentioned the following:

**Walkability**

- Sidewalks- existing, safe
- Downtown- destinations
- Street grids
- Parks
- Destinations
- Accessibility
- Wayfinding and signs

**Bikeability**

- Grant’s Trailnet Trail from Creve Coeur
- Bike Lanes on Wydown

The presentation continued with an overview of how the planning process could help enhance walking and biking in Kirkwood. The need for being aware of costs and balancing them with the vision was also discussed.

The public engagement strategy will focus on tabling at community events in order to inform residents, get their input, and build enthusiasm for walking and biking. When discussing public outreach, the committee raised the following questions and suggestions:

**Public outreach**

- How to reach out to schools?
- Kirkwood School District Facebook page?
- Before and after pictures for infrastructure
- Posts on Kirkwood’s Facebook page
- Information on infrastructure changes at planning events

The planning team will work to address these suggestions. Ryan Spencer will look into posting on the Kirkwood Facebook page. Marielle Brown will develop additional literature for the public outreach events.

The committee also discussed existing conditions in Kirkwood, including popular destinations and barriers. Committee members and the planning team wrote and drew on a map of Kirkwood to help create the existing conditions maps and report, with the following notes:

### Map Comments: Destinations

- Regional attraction: Powder Valley Conservation Center
- Nice Trail: Greentree Park
- Bread Co moving next to Schnuck's on Manchester, increasing ped demand
- Business district
- Keyser Elementary
- Ballas and Dougherty Ferry: Popular route for joggers and bikers
- Connect Kirkwood park to Meramec Greenway
- Adams to Webster Groves
- Robinson Elementary
- Kirkwood Park

### Map Comments: Barriers

- Steep Hill: Marshall under 270
- Intersection of Craig and Old Big Bend
- Intersection and RR crossing Geyer and Big Bend
- Milwaukee and RR - no crossing
- Kirkwood and Woodbine
- Kirkwood and Argonne-- Dark crossing, no lights on street
- Holmes Ave
- Scott Ave
- Bad drain at Manchester and Kirkwood
- Dougherty Ferry and Kirkwood
- Overall, LOTS of interest in Grant's Trail access
- Manchester and Kirkwood
- Manchester and Dickson

Overall, the committee members were enthusiastic about the possibilities for improvement in Kirkwood. Trail access is a major concern for walking and biking, and especially for families. The numerous railroad crossings in Kirkwood are a special challenge for walking and biking access. During and after the mapping exercise, the following concerns were also mentioned in conversation:

- Connections from Meacham to Nipher Middle School (and the rest of town)
  - Kirkwood road connecting to Meacham lacks sidewalks
  - RR Crossing at Argonne
  - Kirkwood is a rail road Quiet Zone, and pushing the railroad too hard could endanger the quiet zone
  - Big Bend and South Geyer intersection difficult for walking and biking
  - Create a strong connection between downtown Kirkwood and downtown Webster
  - There is a bike unfriendly drain at the southwest corner of Geyer and Manchester. Bicyclists are trying to ride to the right, and they are confronted with a fore/aft slotted drain.
  - Cut thru from Pamela lane (north Kirkwood) to the walking path would be a great improvement. There was an unofficial cut thru for years, but a new owner shut it down. This allowed kids to get to both North middle school and Westchester grade school
  - Encouraging walking and biking through incentive programs at local businesses for people arriving on foot and on bike
- The meeting ended with a brief discussion of early action projects. Marielle Brown will share additional information about potential early action projects with the committee in order to discuss the project at the next meeting. As the meeting was closing, members emphasized the importance of prioritizing school and trail access, reaching out to children, and ensuring improvements are family friendly.

## Kirkwood Planning Advisory Committee

### Meeting #2: June 23, 2014

#### Summary

#### Attendance:

Community members:

Steve Coates

David Eagleton

Alan Hopefl

Nancy Luetzow

Marcia Marden

Ryan Moore

James Myers

Robert Trottnan

#### Technical members:

Michelle Voegele, MODOT

Tobi Moriarty, St. Louis County Highways & Traffic

Carey Bundy, Great Rivers Greenway

John Wagner, Metro Transit (Bi-State Development Agency)

#### City of Kirkwood:

Bill Bensing, Public Services

Murray Pounds, Parks & Recreation

Ryan Spencer, Engineering/ Planning & Zoning

#### Trainer:

Marielle Brown

Melissa Chapnick

#### Meeting summary

The meeting started with speakers: Donna Poe, of the Kirkwood Small Business District, and the Reilly family, speaking about walking and biking to school in Kirkwood. Donna Poe spoke about the importance of walking and biking for a vibrant business district. Bicycle parking racks have recently been installed in downtown, and she believes that there may still be demand for more racks. Committee members

asked questions about high priority intersections and planning for bicycle parking. Following the meeting, Donna Poe submitted the following additional comments:

1. We are very interested in some sort of bike sharing program. We have talked about testing it with reclaimed bikes and possibly having a corporate sponsor as some other cities have done. We think there are good opportunities for circulation between Kirkwood Park and downtown Kirkwood in addition to around the business district.
2. There is a limit to the amount of funding we have for bike racks and appropriate places for them—but we don't believe we have exhausted the supply of appropriate locations.
3. The SBD has a significant investment in the plantings and street furniture that make our district pedestrian friendly. We believe there are significant opportunities for improvement on the north end of the SBD. Sidewalk maintenance/tree roots are issues along with the some dangerous places as discussed last night.
4. From a resident's perspective, there are several neighborhoods in Kirkwood that have walking paths already through them and leading to schools and other neighborhoods. Some of these paths need maintenance and rehabilitation. It would be a good thing to find out where all of these existing paths are located and work on marking them to increase use. Several in the Greenbriar/Osage Hills neighborhood are not marked or maintained.

Jan Reilly and her two sons spoke about getting to school on foot and on bicycle. The family chose to live in Kirkwood in part because of the active lifestyle. Currently, her sons are able to walk to school as they live a few blocks away. However, in the fall the oldest son will be starting at North Kirkwood Middle School, which is 1.4 miles from their house. The family does not feel safe crossing Kirkwood Road. Crossing Manchester can also be difficult.

After the guest speakers, Marielle Brown presented the results of the public outreach. The main objective of the meeting was to identify

community priorities for the plan. The priorities are meant to guide decisions made during the planning process and beyond. Committee members were asked to create a set of up to 5 community priorities based on the input from the public outreach and surveys, in addition to their experiences and knowledge of Kirkwood. Committee members were asked to write down priorities on sticky notes during the discussion of public outreach results.

The presentation focused on the poster poll, the online survey, and the mail-in survey. Committee members questioned the reliability of the surveys. None of the surveys used a random sample. It was possible for non-residents to take the online poll, or for someone to take the survey multiple times by clearing their internet browser, or using a different computer. Due to the weaknesses with online surveys, including self-selection, the planning team also sent out a survey with utility bills and performed public outreach at community events to get a wider group of responses. When looking at the results, the results can not be extended to all Kirkwood residents.

Respondents across all three surveys tended to favor safety over speed and convenience for driving. Respondents were interested in walking and bicycling, and many expressed the desire to increase their walking and bicycling. A full summary of the survey results will be made available to the public as part of the planning process.

After the presentation, the committee members were given several minutes to write notes on priorities. They were then broken into two smaller groups to discuss their priorities and come to a consensus on up to five priorities. Finally, the two groups shared their priorities, and combined them into one list. Throughout the process there were several recurring themes, including safety, connecting popular destinations, and promoting Kirkwood's reputation for being walkable and bikeable. Technical members and Kirkwood staff participated in the conversation as well.

**Priorities:**

The first group to present was facilitated by Melissa Chapnick, and the

members were David Eagleton, Alan Hopefl, Nancy Luetzow, Robert Trotman, Ryan Moore, James Myers Tobi Moriarty, and Carey Bundy. The priorities they reported out were:

- Traffic calming, especially along major intersections and major roads
- Share the Road education
- Connectivity between trails, schools, downtown, and other cities
- Infrastructure, including sidewalks and crosswalks
- Normalization of walking and bicycling
- Kirkwood should be promoted as a bicycle friendly destination
- Responsible funding for implementation

The second group, facilitated by Marielle Brown, included Steve Coates, Marcia Marden, Ryan Moore, Michelle Voegele, John Wagner, Bill Bensing, and Murray Pounds. The group had similar priorities, with the additions of:

- Accessibility for people of all ages and abilities
- Showcasing Kirkwood's greenspace

The group focused on concepts, rather than refining the language. Combining the two lists, the draft priorities were:

1. Safely connecting schools, businesses, and parks
2. Traffic calming infrastructure that supports walking, biking and accessibility for people of all ages and abilities
3. Education and promotion of walking, biking, and greenspace in Kirkwood
4. Financial responsibility and consideration of multiple funding sources

The committee was supposed to brainstorm Early Action Projects, but ran out of time. The Early Action Project brainstorm will take place on line.

The next meeting will take place in September. Once the date is scheduled, the information will be available online.

## Kirkwood Planning Advisory Committee

**Meeting #3: July 16, 2014**

### Summary

#### Attendance:

Community members:

David Eagleton

Kim Fitzgerald

Carol Gilster, via phone

Nancy Luetzow

Ryan Moore

James Myers

Donna Poe

Robert Trotzman

#### Technical members:

Tobi Moriarty, St. Louis County Highways & Traffic

Carey Bundy, Great Rivers Greenway

#### City of Kirkwood:

Bill Bensing, Public Services

Todd Rehg, Engineering

Ryan Spencer, Engineering/ Planning & Zoning

#### Trailnet:

Marielle Brown

Melissa Chapnick

#### Meeting Summary

The meeting focused on determining a feasible Early Action Project.

Marielle Brown reviewed the reasons for an Early Action Project—mainly to demonstrate a walkable and bikeable place, and to create enthusiasm for improved walking and biking in Kirkwood. The group then set about brainstorming ideas for an Early Action Project, along with possible locations and times.

Marielle Brown reviewed the previously described the previously

mentioned ideas: intersection repair or painting, Open Streets, and Parking) Day. The committee agreed the project should reflect the themes of the plan, including safety.

Carol Gilster noted the importance of focusing on fixing existing infrastructure, especially sidewalks and sidewalk ramps that cause problems for people using mobility devices or pushing strollers. The committee agreed to the high priority of addressing infrastructure during the implementation phase.

The possibility of a bike lane along Scott Avenue, to connect to Grant's Trail, was brought up by David Eagleton. He supplied supporting documents, including an email from Ryan Moore, another committee member. The committee agreed that finding a safe connection to Grant's Trail should be a high priority for the implementation phase.

Open Streets with model infrastructure would allow the bike lane to be piloted for the day without the need to pass an ordinance before the event. The committee expressed support for an Open Streets event that would incorporate education by displaying temporary pilots of bicycle infrastructure. The two locations discussed were either near Scott Avenue, or near Keysor Elementary School to coincide with an annual bike event hosted by the school. The committee ultimately decided Scott Avenue was a better choice, as it would appeal to the larger community, and would help demonstrate safe access to Grant's Trail.

Pedestrian audits were discussed, as well as ways to educate people at the event about inadequate curb cuts. Melissa Chapnick circulated a sample pedestrian audit form that could be made available to residents if they would like to perform pedestrian audits independently. Educational flyers could also be created for the Open Streets event.

The last weekend in September and the first weekend in October were considered. Donna Poe noted there would be events in Downtown Kirkwood both weekends if we would like to cross-promote. Marielle Brown will meet with the City of Kirkwood staff to figure out the exact location and date that is the most feasible.

The meeting adjourned at 7:00 pm.

**Kirkwood Planning Advisory Committee Meeting #4: August 28, 2014 Summary**

Attendance:

Community members:

- David Eagleton
- Alan Hopefl
- Madt Mallinckrodt
- Donna Muellner
- Donna Poe

Technical members:

- Carey Bundy, Great Rivers Greenway
- Tobi Moriarty, St. Louis County Highways & Traffic
- John Wagner, Metro Transit (Bi-State Development Agency)

City of Kirkwood:

- Bill Bensing, Public Services
- Ryan Spencer, Engineering/ Planning & Zoning

Trailnet:

- Marielle Brown
- Cindy Mense

Meeting Summary

The meeting focused on promoting the upcoming public review opportunities and reviewing the Draft Plan and its presentation.

Marielle Brown started the meeting by reviewing the location and activities planned for Bike Walk Play Kirkwood! and soliciting volunteers from the Committee. She also asked the committee members to help promote the plan review at the Greentree festival and at Bike Walk Play Kirkwood! The committee brainstormed multiple ways to promote the activities, and potential partners. The committee also discussed handing out bicycle safety equipment such as mirrors at the event. David

Eagleton will work with Marielle to find partners and to promote Bike Walk Play Kirkwood!

The second part of the meeting was devoted to discussion of the draft plan. The committee agreed that the maps were confusing, and did not give a clear picture of the proposals, especially the pedestrian maps. Marielle and Cindy will work to improve and revise the map presentation before the first public review event. Bill Bensing suggested adding the classification of roads, to help distinguish those that are eligible for federal funding. The committee would also like to see sample pictures of crosswalks that could be considered in Kirkwood.

In terms of the proposed bicycle route alternatives, the following issues were raised:

- Taylor should be included in the plan, as should Clinton between Fillmore and Leffingwell
- Adams and Ballas are an important route and need safe infrastructure
- Kirkwood Road is unpleasant to bike on and almost never used; however extending the current road diet could improve walking and commerce along Kirkwood Road

The pedestrian map needed lots of clarification, and the committee agreed that the current color scheme was not useful. Committee members identified the following areas as high priority:

- Ballas and Adams in Sugar Creek Valley
- Dougherty Ferry from Essex to Geyer, and Essex from Dougherty Ferry to Geyer
- Kirkwood Road south of Big Bend
- The railroad tracks at Fillmore where students cross to get to school

The following intersections were also considered high priority:

- Manchester at the following intersections: Woodlawn, Kirkwood, Geyer, and the crossing in front of North Kirkwood Middle School
- Kirkwood at Manchester, Essex, and Big Bend
- Geyer at Manchester, Peeke/Dougherty Ferry, Essex, Adams, Jefferson, and Big Bend
- Taylor at Argonne, Adams, and Quan

In terms of overall priorities, the committee discussed the need for the downtown grid to be walkable, and for streets near schools to have sidewalks on both sides. The committee also discussed the need for prioritization of key north/south and east/west corridors.

**Kirkwood Planning Advisory Committee Meeting #5: November 18, 2014 Summary notes**

Attendees:

Steve Coates	Park Board
David Eagleton	Resident
Alan Hopefl	Former Park Board Member
Nancy Luetzow	City Council
Madt Mallinckrodt	Planning and Zoning Board of Adjustment
James Meyers	St. Louis County Traffic and Highways
Tobi Moriarty	Resident
Donna Mueller	Downtown Kirkwood
Donna Poe	Resident
Robert Trotman	MODOT
Michelle Voegele	Resident
Denise Whitworth	
Bill Bensing	Kirkwood Public Services
Murray Pounds	Kirkwood Parks and Recreation
Ryan Spencer	Kirkwood Planning
Marielle Brown	Trailnet
Cindy Mense	Trailnet

The Planning Advisory Committee met to review public comments and the proposed changes to that will be included in the final version of the Pedestrian and Bicycle Master Plan.

The meeting started with a review of the Early Action Project and the public comment received at the event. The pop-up crosswalk was generally well received by the public and there is interest in a permanent crosswalk being installed on Argonne. The planning team and volunteers talked to dozens of people at the event. The feedback largely supported earlier outreach efforts, with general support for the plan and increased walkability and bikeability.

The planning team did not collect demographic information at the event, and the public outreach has not included a statistically valid sample. There is concern that the public outreach does not accurately reflect the residents of Kirkwood. While a statistically valid sample was not feasible for the budget of this project, the planning team sought public outreach opportunities where they could talk to a larger group of people than those that might already be involved in walking or biking issues.

Both at the event and through emails, some residents expressed concern over the shared use paths that were included as alternatives for Marshall Road and Adams Road. The planning team proposed the final recommendation for access to Meramec Greenway to be along Timberbrook Drive, rather than Marshall Road. There is the potential to connect the existing greenway to the intersection of Timberbrook Drive and Marshall via the land owned by the City of Kirkwood Utilities.

The proposed final recommendation for Adams will be to reduce the width of the lanes, based on engineering judgment and St. Louis County Highways and Traffic Policy, when the road is repaved next. This will increase space for walking and biking, without adding any additional pavement. There is a potential that a "lane diet" (narrowing the lanes), will reduce traffic speeds slightly. At this time, there are no plans to repave this section of Adams, but it is conceivable that it will happen within the next 15 years.

The alternatives that were listed as neighborhood greenways were largely unpopular, and will not be in the final plan, with the exception of the Timberbrook Drive route. There is no clear alternative to the Manchester route because of lack of connectivity along neighborhood streets.

Michelle Voegele of MoDOT spoke to the sections of MO 100 (Manchester Rd) and Lindbergh/Kirkwood Rd under MoDOT jurisdiction. MoDOT does support the Gateway Bike Plan. Kirkwood Rd/Lindbergh is identified as a "share the road" facility not road diet on the draft map. MO 100 is shown as 'bike lane' on the Gateway Bike Plan but that does not mean that it will be a road diet as the draft plan and map incorrectly

identified, but rather that it would be reserved through redevelopment with right of way dedications where applicable. Any reduction in the number of existing through lanes must be documented with further analysis and supported in a traffic impact study.

The final version of the plan will correct these mistakes, and it will reflect the Gateway Bike Plan, without reference to a road diet.

The final plan will include prioritization based on the principles identified by the committee, along with cost estimates. The planning team will also include a recommendation for Kirkwood to consider a Complete Streets policy and an ongoing Pedestrian and Bicycle Committee.

The Committee suggested several things should be added to the plan, including:

- Crossing improvements Manchester and Woodlawn
- Library crosswalk
- Examples of crosswalks
- Argonne crossings
- Railroad crossings
- Definitions/ glossary
- Graphics
- Details on potential Grant's Trail connections

The final Planning Advisory Committee Meeting will take place on December 10th. Prior to the meeting, the Committee will receive the final content for the plan, though the layout will not be finished until January. At that meeting, the Committee will discuss next steps for walking and biking in Kirkwood.

The planning team will present the plan during a Council Work Session in January or February. The plan will be made available to the public before it is presented to City Council.

## Kirkwood Pedestrian and Bicycle Master Plan Planning Advisory Committee December 10, 2014 Meeting Summary

Committee members in attendance:

Carey Bundy	Great Rivers Greenway
David Eagleton	Resident
Alan Hopefl	Former Park Board Member
Nancy Luetzow	City Council
Madt Mallinckrodt	Planning and Zoning
Tobi Moriarty	St. Louis County Highways and Traffic
Donna Muellner	Resident
Robert Trottmann	Resident
Michelle Voegele	MODOT
John Wagner	Metro
Frank Wentz	Resident
Bill Bensing	City of Kirkwood
Murray Pounds	City of Kirkwood
Ryan Spencer	City of Kirkwood
Marielle Brown	Trailnet
Cindy Mense	Trailnet

Community members in attendance:

Ed Bovier	Resident
John Klingner	Resident
Wes Ridgeway	Missouri Bicycle and Pedestrian Federation

### Summary:

The objectives of the meeting were to review the final recommendation based on committee and public feedback and to discuss next steps for implementation. Marielle Brown presented the final recommendations, which can be reviewed in the accompanying presentation.

The final recommendations for walking and biking routes follow what was discussed in the previous meeting. Marshall Road will not have any recommended changes. The recommended route for accessing the Meramec Greenway will be Timberbrook Drive. In Sugar Creek Valley, W Adams and N Ballas are recommended for a "lane diet," or lane narrowing, the next time the road is repaved. The travel lanes may be able to be striped more narrowly, to create additional room in the shoulders without expanding the pavement. Ultimately, the width of the lanes should be determined by the St. Louis County Highways and Traffic engineering expertise.

The final recommendation for access to Grant's Trail comprises two phases-- a first phase of Shared Lane Markings along Holmes and a Neighborhood Greenway on Scott. At the same time, the City should continue working with Great Rivers Greenway to collaborate on a separated trail along the old railroad spur.

The committee discussed bicycle signage for Kirkwood. Trailnet recommends that the signage be consistent, with wayfinding information for destinations and routes on all signs. Donna Muellner pointed out that Bike St. Louis in Kirkwood and the Kirkwood routes serve different functions. The City of Kirkwood will have to decide on the type of signage they will use to establish the wayfinding system, based on whether they want locally unique signs or standard signs that are eligible for federal grants.

The draft recommendations for encouragement, education, enforcement, and evaluation have been carried forward into the final plan recommendations. Several of the recommendations, including a bike audit for the staff, will be initiated as part of the planning process, in order to jump start implementation. The final plan recommends updating City Code to support walking and biking, including a Complete Streets Policy to assure that future street improvements accommodate all users.

The next steps in the planning process are two neighborhood walks and tours of planned improvements on Saturday, January 24, and a presentation of the recommendations to the City Council during a work session. The work session date will be announced when it is finalized.

## First Round of Public Outreach

The first round of public outreach for the Kirkwood Pedestrian and Bicycle Master Plan took place from April 1, 2014 through June 14, 2014. The public outreach consisted of two surveys and four pop-up tabling events.

The first round of public outreach emphasized gathering comments and opinions from the public to better understand community values and priorities for transportation in Kirkwood. The pop-up tabling events captured public comments in the following ways:

- poster poll of six questions
- maps of Kirkwood, for residents to draw favorite routes and barriers on
- comment cards
- paper copies of the online surveys
- surveys designed for children 6 through 16

In addition to capturing public comments, the public was able to talk to the planning team about the process. We provided fliers on the process itself, and fliers with information about different forms of walking and biking infrastructure. Overall, we interacted with over 90 people, based on the number of stickers on the poster polls. The results from the process are summarized below.

### Events

The pop-up tabling events were conceived as a chance to take the materials typically found in an Open House to public events, in order to get both a larger and wider audience for the public outreach. The tabling events were publicized online (on Trainet's website and Kirkwood's website), as well as in the Webster-Kirkwood Times. The pop-up tabling events took place at popular social events in Kirkwood, which gave us the chance to talk with residents who may not have otherwise come to a traditional Open House. The events were:

- Kirkwood Chamber of Commerce Expo, April 1

- Kirkwood Mayfest, May 10
- Kirkwood Summer Concert, June 5
- Magic House Good To Grow Festival in Kirkwood, June 14

The Chamber Expo was an excellent opportunity to speak with retired residents. Mayfest and the Summer Concert Series both drew residents of all ages, and from all over Kirkwood. We chose to table at The Good To Grow Festival in the hopes of speaking to families with children in Kirkwood. While the festival was well attended by families with children, few of them were from Kirkwood, so very few responses were gathered.

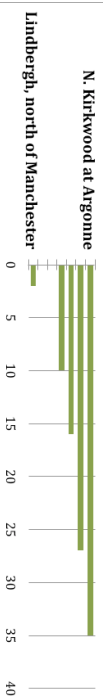
### Poster poll

The informal poster poll asked residents to place stickers along a scale with 7 marks between two opposite choices. Each choice was illustrated with a photo. At the end of the event, the stickers were counted, and were assigned to the mark it was closest to. When the stickers were halfway between two marks, they were assigned to the mark to the right on the poster (lower on the scale on these graphs). Both the survey collection and counting methodology can only give a general impression of the opinions expressed. They do not represent a rigorous survey process.

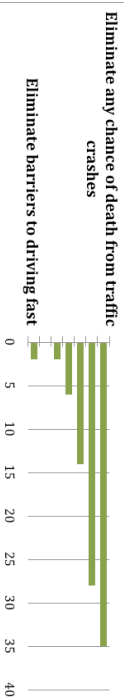
### Mapping comments

Residents were invited to give written comments through a map of Kirkwood and through comment cards. When residents were hesitant to draw on the maps, the planning team recorded the residents' comments on the maps. At the Chamber Expo, the table was narrow, which discouraged residents from drawing on the map. In order to improve clarity, residents were asked to use color-coded markers at the last two events.

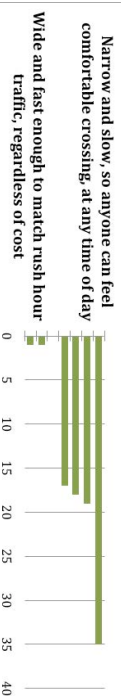
### Imagining Kirkwood in 15 years, I would like to see streets look more like...



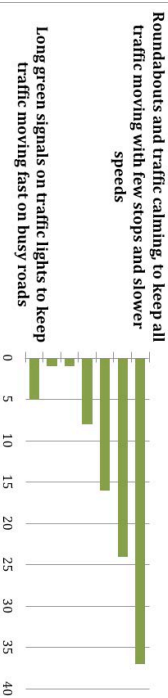
### Streets should be designed to...



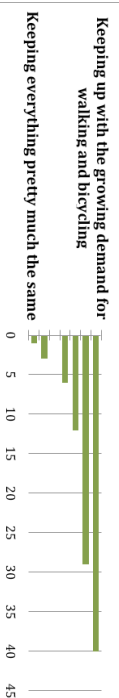
### Streets should be...



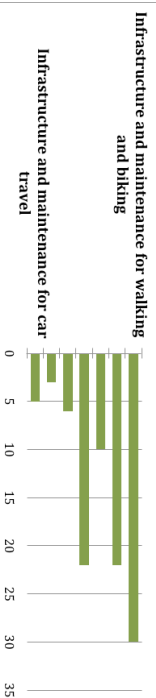
### If travel time is the same, I'd like car traffic to be controlled through...



### The highest priority for the transportation system should be...



### The transportation budget should be spent on...



## Chamber Expo map comments

- Bridge over 270 at Big Bend is unpleasant and dangerous. The low railing makes it scary for riding a bike, and apparently attracts people trying to commit suicide.
- Sidewalk on Craig is not continuous.
- Is there a chance of paving trails in the Kirkwood City Park?
- Get bikes off of Geyer. They do not follow the rules of the road.
- I want bikes on Geyer! The shoulder is not clean and there are too many ruts, so it is unsafe for cycling.
- Taylor at Taylor Woods is a great place to walk.
- Mermud is an awkward intersection, and a place for a potential roundabout.

## Mayfest map comments

- Brownell, Glendower and Chelsea- people walking in street and cut-through traffic; headed to school in Glendale
- Swan and Kirkwood- stop sign needed: high speeds and children walking; visibility issues due to hill
- Streets like Bodley should be one-way traffic only as they are too narrow
- Bodley needs a sidewalk on both sides
- Longview and Bodley are highlighted with needs sidewalk
- Wilson, between Simmons and Kirkwood Ave, is dotted with needs sidewalk for loop
- Churchill, between Clay and Kirkwood, is highlighted with Needs Sidewalk in sidewalk gap
- The intersection of Woodlawn and Jefferson is highlighted as Needs 4-Way Stop
- The intersections of Geyer and Peeke and Geyer and Essex are also highlighted as places of concern
- Argonne- Connection from City Park to Grant's Trail; need ped/bike signage
- Ballas, from Ebsworth Park to Kirkwood City Park, is marked needs better shoulders
- An additional note adds, beautiful, but difficult to change
- The intersection of Lark and Couch is marked Dangerous Pedestrian

### Crossing

- Marshall Road - Narrow, trucks
- Sidewalk in need of repair on Lee Ave, speed bump would be helpful- cut thru is too fast
- Need crosswalk on Big Bend and Geyer on east side over railroad tracks
- Sidewalks only one side of Geyer between City boundaries and Geyer Forest and no shoulders; there are no crosswalks on Geyer along the same stretch
- I want my child to bicycle to the park is also noted at this intersection
- Bike lanes along Rose Hill are so comfortable for riding
- Multiple blind spots along Geyer headed out of Kirkwood are noted
- The land between Greentree Park and Emmenegger Nature Park is highlighted as private property.
- Signage is important for proper entrance to Emmenegger Park is noted along the north side of the park
- The area around Greentree park is noted Safe connection to Grant's Trail
- Big Bend between the city limits and 270 is noted needs better shoulders
- Big Bend, where it crosses 270, is noted as a dangerous intersection.
- An additional note says "Need a bridge here like on Clay and Argonne for pedestrians"

### Concert Series map

The following corridors are highlighted in red for danger:

- Geyer, between Rose Hill and 44
- Marshall from Greentree Park to Big Bend
- Big Bend from City limits to Marshall
- N Kirkwood Rd from Washington to Swan
- Taylor, from Adams to Nipher Middle School
- Fillmore from Adams to the train tracks, along with a note- need to make sidewalk connections
- Adams, north of Kirkwood park, with a sign that says Speed limit

needed, people too fast.

The following intersections are highlighted in red for danger:

- Intersection of Old Big Bend and Craig is highlighted in red with the note "still dangerous for bicyclists:"
- The intersection of Dougherty Ferry and 270
- The intersection of Dougherty Ferry and Ballas

### Additional comments:

- A note on Ballas says "Neighborhood opposed to widening"
- The intersection of Argonne and Van Buren is highlighted with "Should be a stop sign." Also traffic is too fast on Argonne is noted.
- Dougherty Ferry, Peeke, and Essex were all highlighted in green by a man who wanted to mark where he saw cyclists.
- Geyer and Harrison are marked in blue with the note No Full Sidewalk
- Good to Grow Festival Map
- Manchester is too busy for walking. It needs real crosswalks.
- Woodard and Geyer are marked "Feels safe going from Woodard to City Park."

### Children's surveys

Children were asked to fill out a survey that consisted of one question, "How would you make Kirkwood a better place to walk and bike?" The survey provided several lines for text, in addition to a space for drawing a picture. Markers and crayons were provided for filling out the surveys. Children were asked to write down their age, and some did. Many also wrote down their names. To protect their anonymity, the names have not been included. No children filled out a survey at the Chamber Event.

### Mayfest children's surveys

- I propose that we make a bike riding course to bike around the neighborhood.
- Hi. I'm L\_\_\_\_\_. I am 8. I think flat spaces would make Kirkwood a

better place to walk and bike. (Drawing features picture of girl biking on a flat line with a tree in the background).

- I would like to see more trails and more bike paths. Also more plants and trees along all paths. (Drawing features trees and flowers with the words "Need" and "Flowers" repeated multiple times).

- My name is L\_ \_ \_ \_ \_ . I am 9. I think we should have trails and more roads. Thank you! (Drawing features several roads with the word roads).

- I think that it would be nice if there were more trails and places to ride. (Drawing features a bike on a flat line with a frowny face. A bike near a hill has a smiley face).

- I would like to see more trails in Kirkwood and bike routes. (Drawing has trail, bike rack, and tree, all labeled).

- I would like to see that there are more bikeriding and walking trails. (Drawing has boys, girls, and bikes along multiple trails).

### Good to Grow Festival children's surveys

- Make lights for bikes so people can see us. Illustrated with a bicycle and lights.

- Birds. Illustrated with a bird.

- Illustration of flowers.

- I think a way people could make Kirkwood a better place to walk and bike is to make sure all of the sidewalks are even to build more parks and natures reserves. Thanks.

### Comment cards

Comment cards were provided at all of the events. For the most part, residents preferred to note their comments on the maps. We received no comment cards at the Chamber Expo, nor at the Good To Grow Festival. Several residents at the Concert Series added bullet points and numbers within their comments, so the overall comments are lettered for clarity.

### Mayfest comment cards

- Public awareness and encouragement to support "Good Neighbor" relationships with private landowner neighbors. Appreciate and respect each others rights. The "few" ruin for the majority. Self police and awareness to correct the few.

- Comments regarding sidewalks for pedestrians and w/c [wheelchair] users- uneven sidewalks ramps between Woodlawn and Walgreens to Finch.

### Concert series

A.

- Kirkwood need to create a single lane of traffic from Essex South to Woodbine. Add street parking with added landscape also promote shops and restaurants to use the added space as street shopping and dining (outdoor).

- Kirkwood need to reduce the traffic (auto) speed through downtown - from Woodbine to Manchester to 20 mph. This would help reduce excess through traffic.

- Shops need to address the street front and parking needs to be behind shops and stores to help create a community experience.

B.

- I am passionately opposed to any bike/hike trail development through Emmenegger Nature Park, our legacy nature park deserves preservation and restoration, not recreational development, aka WRECK-REACTION.

- The Sugar Creek Valley area of West Adams/ Ballas is a natural treasure and its ambience should not be destroyed by street widening or sidewalks. Respect the signs: "Entering Sugar Creek Valley. Preserve its beauty and wildlife."

C.

- Please provide dedicated bike lanes that will connect Grants Trail with Fenton trails

- Improve quality of roads. Kirkwood roads are full of potholes (much worse than Webster).

D.

- Good - excellent bike parking, locking, protection in downtown area as well as other strategic areas.
- Very safe obvious dedicated bike/walk connection from downtown (train station) to Grant's Trailhead with signage at the trail head and downtown to let people know what's available. (such as a list of amenities in downtown Kirkwood. Also makes Holmes safer for bikes (very sad that wasn't addressed during recent improvements).
- I personally think with handicaps and elderly people can ride their electric transportation. There are an increasing number and this would profoundly increase their ability to transport and enjoy the outdoors.
- I Getting annual weekends where Kirkwood partners with towns that Amtrak stops at near Katy Trail and connect with each other.

**Figure D-1 :Sample Pedestrian Prioritization Table**

<b>Street Name:</b>				
<b>Recommended improvement:</b>				
<b>Length (miles):</b>				
<b>Estimated Cost:</b>				
<b>Existing sidewalk? (No = 0, One Side = 1, Two Sides = 2, Path = 3)</b>				
	Prioritization Criteria	Score	Weight	Weighted Score
1.1	Number of Public and Private Schools (k-12 and Community College) near route		30	
1.2	Direct access to a transit stop (yes=1; no=0)		15	
1.3	Direct access to a commercial area (yes=1; no=0)		20	
1.4	Number of public facilities (city hall, library, etc.) near route		10	
1.5	Number of parks with direct access		25	
2.1	Connects existings sidewalks (yes=1; no=0)		25	
2.2	Access to a regional multi-use path (yes=1; no=0)		25	
2.3	Improves pedestrian access along or across a major road (yes=1; no=0)		25	
2.4	Crosses freeway or railroad tracks (yes=1; no=0)		25	
3.1	Recommended by community feedback (1 = maximum support; 0 = little to no support)		60	
3.2	Recommended by agency feedback (1 = maximum support; 0=little to no support)		60	
3.3	Multiple funding sources possible		15	
3.4	Cost (4 = under \$80,000; 3 = \$80,001 to \$160,000; 2 = \$160,001 to \$320,000; 1 = \$320,001 to \$640,000; 0 = over \$640,000)		30	

**Total Score**