Active Transportation Plan

A Complete Streets Roadmap

2021

St. Joseph Area Transportation Study Organization

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Recognitions

This plan was updated by several different contributors during the last several years, including Ty Nagle, MPO Transportation Planner, Steve Wenger, Vice-President of Mosaic Life-Care and founding member of *Live Well St. Joseph*, among others.

It was a difficult period to plan for the future of a walkable, non-motorized infrastructure with the rapid impact of technology on the subject that has been unprecedented. No longer can traditional lines be drawn in some areas of the subject between human powered and power assisted transportation modes. How to accommodate this new technology into the public infrastructure is a challenge at the cutting edge of the national experience. Pedal assist bikes, powered scooters, etc.--- were not common just a few years ago. New terms such as micro-mobility and micro-transit didn't exist a scant few years but are now part of the transportation lexicon.

National policy has greatly fluctuated in the last five years, recognizing the correlation between the use and availability of non-motorized infrastructure and the obesity rates in a community was a common-sense recognition but also new to the conversation. The perspective invited a new group of professionals to the table that were not conversant in the transportation dialogue but clearly understood its connection to their mission of supporting and creating a healthy community. Those insights made a difference and thank you to all of the professionals that lent their expertise to this update from Mosaic.

FORWARD

Bicycling and walking issues have grown in significance throughout the 1990's and continue to expand into the 21st Century. As the new millennium unfolds, public agencies and public interest groups alike are striving to define the most appropriate way in which to include the two modes within the overall transportation system so that those who walk or ride bicycles can safely, conveniently, and comfortably access every destination within a community.

Public support and advocacy for improved conditions for bicycling and walking has created a widespread acceptance that more should be done to enhance the safety, comfort, and convenience of the non-motorized traveler. Public opinion surveys in the last 15 years have demonstrated strong support for increased planning, funding and implementation of shared use paths, sidewalks, and on-street facilities.

At the same time, public agencies have become considerably better equipped to respond to this demand. Research and practical experience in designing facilities for bicyclists and pedestrians have generated numerous national, state, and local design manuals and resources. An increasing number of professional planners and engineers are familiar with this material and are applying this knowledge in towns and cities across the country.

The 1990 Americans with Disabilities Act, building on an earlier law requiring curb ramps in new, altered, and existing sidewalks, added impetus to improving conditions for sidewalk users. People with disabilities rely on the pedestrian and transit infrastructure, and the links between them, for access and mobility.

Congress and many state legislatures have made it considerably easier in recent years to fund non-motorized projects and programs, and a number of laws and regulations now mandate certain planning activities and design standards to guarantee the inclusion of bicyclists and pedestrians. In fact, the St. Joseph Area Transportation Study Organization, in its recent update to the twenty-year metropolitan transportation plan, it is stated that bicyclists and pedestrians are *intended users* of roadway network.

Despite these many advances, injury and fatality numbers for bicyclists and pedestrians remain stubbornly high, levels of bicycling and walking remain frustratingly low, and most communities continue to grow in ways that make travel by means other than the private automobile quite challenging. Failure to provide an accessible pedestrian network for people with disabilities often requires the provision of costly paratransit (public transit service for the disabled community) service. Ongoing investment in the Nation's transportation infrastructure is still more likely to overlook rather than integrate bicyclists and pedestrians.

--Excerpt from Federal Highway Administration *Design Guidance, Accommodating Bicycle and Pedestrian Travel: A Recommended Approach*, 1999.

St. Joseph Metro
Non-Motorized Plan
A Complete Streets Roadmap

Since the 2001 version of this plan, great work has been provided by leaders in the field to examine the impacts of policies upon pedestrian and bicycle safety. The following excerpt is from *Pedestrian and Bicyclist Standards in Large Central Cities*, Allison L.C. de Cerreno, Ph.D. and My Linh H. Nguyen-Novotny, Rudin Center for Transportation and Management, January 2006:

Short-Changing Pedestrians and Bicyclists?

Mean Streets 2004, a Surface Transportation Policy Project (STPP) report by Michelle Ernst, analyzes federal transportation funds over the twelve-year period from 1992-2003 and finds that no state spends more than 2.5% of federal transportation funds on safety programs for pedestrians and/or bicyclists. Additionally, Ernst suggests that for more than twelve years, states have missed the opportunity to allocate $1.6 billion on bicycle and pedestrian projects available through federal law; instead "many states have chosen to leave this money on the table rather than do the projects that could make walking and bicycling safer for everyone."

Anecdotally, it is important to note here that some state and local governments argue that the amount of money spent on bicycle and pedestrian facilities and safety is often undercounted. In many cases, they argue, when roadways or bridges are being rehabilitated, modifications for improved access or safety for pedestrians and bicyclists are made at the same time but such efforts are not formally tracked as pedestrian or bicycle-related projects. Further, while the percentages may still be small, the total amount of funding has increased greatly over the years. In 1991, states and MPOs spent $17.1 million in federal funds on stand-alone bicycle and pedestrian projects; in 2001, that figure had risen to $339.1 million.

In the Midwest is common to broach the subject of user fees and their relationship to non-motorized transportation project funding. Essentially, the argument is that non-motorized users do not pay user fees (vehicle registration and fuel taxes) and therefore are now "owed" any investment in facilities. However, In *Whose Roads?* Todd Litman states that "while it is true that most highway expenses are funded by user fees, roughly 40% still comes from general taxes and bonds. Moreover, most local roads, where 90% of walking and bicycling occur, are funded primarily through general taxes that residents pay regardless of how they choose to travel".

Litman relates similar findings to Ernst, noting that generally local governments provide about 5-15% of their transportation budgets on non-motorized modes while far less support is provided by other levels of government. He points to Oregon, a leading state in pedestrian and bicycling planning, noting that it spends only 2% of state transportation

funds on non-motorized programs. Most states are spending less than 1% of their budget (not counting the enhancement programs that are not state funds to begin with). Ernst notes that these low levels of spending on pedestrian and bicyclists' facilities results from the way funding is provided. "Because the state Departments of Transportation typically control the vast majority of federal funds…federally-funded roads have tended to be designed and built with little regard to local needs…." The result is often high-speed arterials, focused more on moving vehicles than on moving people or allowing for bicyclists; precisely the kinds of roads that pose the most hazards for pedestrians and bicyclists.

Context Sensitive Design/Solutions and Land Use Decisions

According to FHWA, context sensitive design (CSD) is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. New York State defines CSD as a philosophy wherein safe transportation solutions are designed in harmony with the community. However defined, CSD incorporates public involvement, an inclusive and multidisciplinary planning process, and flexibility in design.

According to FHWA, in the past:

> ..the "burden" of having to find space for pedestrians and bicyclists has often been rejected as impossible in many communities because of space and funding constraints and a perceived lack of demand. There was also anxiety about encouraging an activity that many felt to be dangerous and fraught with liability issues. Designers continued to design from the centerline out and often simply ran out of space before bike lanes, paved shoulders, sidewalks, and other "amenities" could be included.

These brief excerpts lend some understanding and urgency to employing the concept of designing complete streets in a community. The subject is not simply a mundane discussion of one way to do things versus another:

- The safety issues it represents will save lives in this community.
- The quality of life for the citizens living in the community hangs in the balance.
- For children, seniors, low-income, and increasingly more "regular" people, the mobility supported impacts jobs, health, medical care, neighborhood building, and social interaction.
- Increasingly, street rights-of-way constitute the public space of a community. If a community cannot put forth a plan for how to rescue its existing spaces and build new spaces that is compatible with its community vision, it has no hope for the future.

Unlike previous iterations of bicycle and pedestrian planning put forth and adopted by the MPO and its constituent governments, this update will not include an overview of the history discussing where the notion of planning for non-motorized modes came from, what federal programs encouraged it, and how they are and were funded. The reader is assumed to be knowledgeable of these issues.

Additionally, this document is not simply a plan to discuss trails, nor is it a plan that will discuss only complete streets. Instead, it is a merger of those design principals and concepts that are commonly applied in communities that have accepted the principals of a walkable community. Neither subject exists in a vacuum, thus it is reasonable that both be discussed in their mutual and shared contexts. Really, whether one speaks of trails, sidewalks, bike lanes, development, re-development, landscaping, aesthetics, street retrofitting, planning for the future, safe routes to school, or complete streets, the issue really comes done to defining what "walkability" means, what its benefits are, and how to do it. If one understands and is committed to the concept, the many popular tags concerning what to call it cease to matter.

WHAT ARE *COMPLETE STREETS*?
Unraveling the Mysteries of *Walkable Communities, Complete the Streets,* & Other Terms

The prevailing definition of *Complete Streets* is **streets that are designed and operated to enable safe access for all users.** Although there are subtle differences between *Complete Streets, Walkable Communities, Complete the Streets, Context Sensitive Design, Neo-Traditional Street Design,* and *Taking Back the Streets,* the aim of each is essentially the definition set forth herein. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely move along and across a complete street. Creating complete streets means changing the policies and practices of transportation agencies, from State Departments of Transportation, to cities, villages, and counties.

A complete streets plan ensures that the entire right of way is routinely designed and operated to enable safe access for all users. Transportation agencies must ensure that all road projects result in a complete street appropriate to local context and local planning.

Elements of a Good Complete Streets Plan*:*

- Includes a vision for how and why the community wants to build and re-build its streets.
- Specifies that 'all users' includes pedestrians, bicyclists, and public transportation passengers of all ages and abilities, as well as trucks, buses, and automobiles.
- Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes.
- Is adoptable by all agencies to cover all roads.
- Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way.
- Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions.
- Directs the use of the latest and best design standards while recognizing the need for flexibility in balancing user needs.
- Directs that complete streets solutions compliment the context of the community.
- Establishes performance standards with measurable outcomes.
- Includes specific next steps for implementation of the plan.

Implementation

An effective complete streets plan should prompt transportation agencies to:

- Restructure their procedures to accommodate all users on every project.
- Re-write their design manuals to encompass the safety of all users.
- Re-train planners and engineers in balancing the needs of diverse users.

- Create new data collection procedures to track how well the streets are serving all users.

Network & System Definitions
The terms "network" and "system" are significant within the context of this document.

A network is comprised of the many types of facility systems that support bicycle and pedestrian access. This includes sidewalks, urban trails, shared lane bicycle roadways, rail to trail projects, bicycle lanes, conservation trails, new boulevards, and rural trail connectors. Collectively, these elements or systems provide the infrastructure necessary to support non-vehicular modes of transportation.

Much like the functional classification hierarchy applied to roadways, i.e. local streets connect to collectors - which connect to arterials - which connect to expressways. The non-motorized network cannot function without each of its systems being well planned and designed. Roadways all operate differently and fulfill a different purpose, but the network of roads cannot operate without each of the systems being developed and operated properly. It is much the same with non-motorized transportation.

To that end, terms for the facility types that represent the relative role of each facility type are provided. One will note that many facilities are associated with other, more general designations. It can be part of the Urban Trail System, which also supports the Quad States Trail. These instances underscore the fact that many facility types are appropriate for multiple uses and fulfill multiple roles. A good analogy for the driving public would be a business route designation on an arterial street in a community. The community could look at the road as a local arterial but stepping back it would also fulfill an important role as a highway.

- Non-Motorized Network
  - Includes:
    - Urban Trail System
    - Rails to Trails
    - Historic Parkway & New Boulevard Systems
    - Connector Streets/Complete Streets
    - Safe Routes to School
    - Conservation Trails
    - Rural Trail Connectors
    - Roadways of Focus
    - On-Road Bicycle Routes
    - Traditional Sidewalks
    - Roadways of Focus

- Urban Trail System
  - Includes:
    - Urban Trail (10' wide concrete or crushed aggregate surface in greenway)
    - Rails to Trails
    - Connector Streets/Complete Streets
    - Levee Trails

        - Trail Heads
        - Abandoned Railroad Corridors (corridor preservation)

- Quad States Trail
    - Includes:
        - Urban Trail System (parts)
        - Rural Trail Connectors
        - Rails to Trail (parts)
        - Abandoned Railroad Corridors (parts)
        - On-Road Bicycle Routes (parts)
        - Complete Streets

COMPLETE STREET ELEMENTS
A Complete Streets Vision & Policy

Nearly all Complete Street plans include a vision statement that describes the community's general vision of how the community should function. The MPO's vision is a good example:

> **Transportation Vision Statement:** The St. Joseph MPO envisions a transportation system that encourages healthy, active living, promotes transportation options and independent mobility, increases community safety and access to healthy foods, reduces environmental impact, mitigates climate change, and supports greater social interaction and community identity by providing safe and convenient travel along and across streets through a comprehensive, integrated transportation network for pedestrians, bicyclists, public transportation riders, automobiles, freight, emergency vehicles, and agricultural vehicles. Also included are people of all ages, regardless of socio-economic status, race, ethnicity, as well as children, youth, families, older adults, and individuals with disabilities.

COMPLETE STREETS POLICY

Goal T1: Provide safe and comfortable routes for walking, bicycling, and public transportation to increase use of these modes of transportation. Enable convenient and active travel as part of daily activities. Reduce pollution and meet the needs of all users of the streets, including children, families, older adults, and people with disabilities.

Objective T1.1: Integrate Complete Design features into street design and construction to create safe and inviting environments for all users to walk, bicycle, and use public transportation.

- **T1.1.1.** In planning, designing, and constructing Complete Streets:
    - Include infrastructure that promotes a safe means of travel for all users along the right of way, such as sidewalks, shared use paths, bicycle lanes, and paved shoulders.
    - Include infrastructure that facilitates safe crossing of the right of way, such as accessible curb ramps, crosswalks, refuge islands, and pedestrian signals
    - Ensure that sidewalks, crosswalks, public transportation stops and facilities, and other aspects of the transportation right of way are compliant with the Americans with Disabilities Act and meet the needs of people with different types of disabilities, including mobility impairments, vision impairments, hearing impairments, and others. Ensure that each community's ADA Transition Plan

includes a prioritization method for enhancements and assist in revising if necessary.

- Prioritize incorporation of street design features and techniques that promote safe and comfortable travel by pedestrians, bicyclists, and public transportation riders, such as traffic calming circles, additional traffic calming mechanisms, narrow vehicle lanes, raised medians, transit priority signalization, transit bulb-outs, road diets, street connectivity, and physical buffers and separations between vehicular traffic and other users.
- Ensure use of additional features that improve the comfort and safety of users:
  - Provide pedestrian-oriented signs, pedestrian-scale lighting, benches and other street furniture, bicycle parking facilities, and comfortable and attractive public transportation stops and facilities.
  - Encourage street trees, landscaping, and planting strips, including native plants where possible, in order to buffer traffic noise and protect and shade pedestrians and bicyclists.

- **T1.1.2.** In all street projects, include infrastructure that improves transportation options for pedestrians, bicyclists, and public transportation riders of all ages and abilities.
  - Ensure that this infrastructure is included in planning, design, approval, construction, operations, and maintenance phases of street projects.
  - Incorporate this infrastructure into all construction, reconstruction, retrofit, maintenance, alteration, and repair of streets, bridges, and other portions of the transportation network.
  - Incorporate multimodal improvements into pavement resurfacing, restriping, and signalization operations where the safety and convenience of users can be improved within the scope of the work.
  - Develop systems to implement and monitor incorporation of such infrastructure into construction and reconstruction of private streets.

- **T1.1.3.** Develop policies and tools to improve the MPO's Complete Streets practices:
  - Develop a pedestrian crossings policy to create a transparent decision-making matrix, including matters such as where to place crosswalks and when to use enhanced crossing treatments.
  - Develop policies to improve the safety of crossings and travel in the vicinity of schools and parks.

- Consider developing a transportation demand management/commuter benefits ordinance to encourage residents and employees to walk, bicycle, use public transportation, or carpool.
- Develop a checklist for units of government within the MPO's development and redevelopment projects, to ensure the inclusion of infrastructure providing for safe travel for all users and enhance project outcomes and community impact.

- **T1.1.4.** Encourage transit-oriented development that provides public transportation in close proximity to employment, housing, schools, retailers, and other services and amenities.
- **T1.1.5.** Change transportation investment criteria to ensure that existing transportation funds are available for Complete Streets infrastructure.
- **T1.1.6.** Identify additional funding streams and implementation strategies to retrofit existing streets to include Complete Streets infrastructure.

Objective T1.2: Make Complete Streets practices a routine part of MPO's and member government's everyday operations.

- **T1.2.1.** As necessary, assist and encourage the restructuring and revision of member zoning and subdivision codes, and other plans, laws, procedures, rules, regulations, guidelines, programs, templates, and design manuals, including land use plans, comprehensive plans, and corridor plans in order to integrate, accommodate, and balance the needs of all users in all street projects on public and private streets.
- **T1.2.2.** Develop or revise street standards and design manuals, including cross-section templates and design treatment details, to ensure that standards support and do not impede Complete Streets; coordinate with related policy documents.
- **T1.2.3.** Make training available to planning and public works personnel and consulting firms on the importance of Complete Streets and on implementation and integration of multimodal infrastructure and techniques.
- **T1.2.4.** Encourage coordination among agencies and departments to develop joint prioritization, capital planning and programming, and implementation of street improvement projects and programs.
- **T1.2.5.** Encourage targeted outreach and public participation in community decisions concerning street design and use.
- **T1.2.6.** Establish performance standards with measurable outcomes to assess safety, functionality, and actual use by each category of users; include goals such as:

- By 2040, facilitate a transportation mode shift so that 20 % of trips occur by bicycling or walking.
- By 2030, reduce the number of injuries and fatalities to bicyclists and pedestrians by 10%.
- Reduce per capita vehicle miles traveled by 5% by 2030.
- Provide a high proportion of streets with sidewalks, low design speeds, tree canopy, and street furnishings.
- Increase the miles of bicycle lanes and other bikeways by 50% by 2040.
- Increase the miles of sidewalks by 10% by 2030.

- **T1.2.7.** Replace automobile level of service as a dominant determinant with multimodal level of service assessment criteria.
- **T1.2.8.** Collect baseline data and regularly gather follow-up data in order to assess impact of policies.
  - Collect data regarding the safety, functionality, and actual use by each category of users of the neighborhoods and areas within the MPO.
  - Track public transportation ridership numbers.
  - Track performance standards and goals.
  - Track other performance measures such as number of new curb ramps and new street trees or plantings.
  - Request that major employers partner to monitor and report how employees commute to work.

<u>Objective T1.3</u>: Plan and develop a comprehensive and convenient non-motorized network.

- **T1.3.1.** Follow the direction set for in the MPO's Non-Motorized Plan for a bicycle and pedestrian network that meets the needs of users, including pedestrians, bicyclists, public transportation riders, automobiles, freight operators, agricultural vehicles, and people of all ages and abilities, including children, youth, families, older adults, and individuals with disabilities.
  - Conduct a demand analysis for each category of user, mapping locations that are already oriented to each mode of travel and type of user and those for which there is latent demand.

- For each category of user, map out a preferred transportation network with routes that will enable safe, interconnected, direct, continuous, and efficient travel from each major origination area to each major destination area.
- Encourage public participation in community decisions concerning the demand analysis, preferred route network, and street design and use to ensure that such decisions: (a) result in streets that meet the needs of all users, and (b) are responsive to needs of individuals and groups that traditionally have not participated in public infrastructure design. Include pedestrians, bicyclists, individuals with disabilities, children and youth, families, older adults, public transportation riders, low-income communities, communities of color, and other distinct social groups, and their advocates. Establish ongoing advisory committees and public feedback mechanisms.
- Identify and prioritize necessary changes in order to implement the preferred network; prioritize neighborhoods with the greatest need and projects that significantly alleviate economic, social, racial, or ethnic inequities.
- Coordinate with other agencies to assist in neighborhood access to networks to provide ready access to healthy sources of nutrition.
- Explore the use of non-standard locations and connections for bicycle, pedestrian, and public transportation facilities, such as easements, restored stream corridors, and railroad rights-of way.

- **T1.3.2.** Evaluate timeline and funding of the plan.
  - Assess the degree to which implementation of the plan can be coordinated with planned reconstruction of streets, development projects, utility projects, and other existing funding streams.
  - Develop funding strategies for addressing additional needs; actively pursue funding from state, federal, and other sources.
  - Explore imposing development impact fees and dedication requirements on new development to create paths and other Complete Streets infrastructure.
- **T1.3.3.** In collaboration with other agencies, integrate bicycle, pedestrian, and public transportation facility planning into regional and local transportation planning programs and agencies to encourage connectivity between jurisdictions.
- **T1.3.4.** Develop programs to encourage bicycle use, such as enacting indoor bicycle parking policies to encourage bicycle commuting or testing innovative bicycle facility design.

<u>Objective T1.4</u>: Promote bicycle, pedestrian, and public transportation rider safety.

- **T1.4.1.** Identify physical improvements that would make bicycle and pedestrian travel safer along current major bicycling and walking routes and the proposed future network, prioritizing routes to and from schools.
- **T1.4.2.** Identify safety improvements to pedestrian and bicycle routes used to access public transportation stops; collaborate with St. Joseph Transit to relocate stops where advisable.
- **T1.4.3.** Identify intersections and other locations where collisions have occurred or that present safety challenges for pedestrians, bicyclists, or other users; consider gathering additional data through methods such as walkability/bikeability audits; analyze data; and develop solutions to safety issues.
- **T1.4.4.** Prioritize modifications to the identified locations and identify funding streams and implementation strategies, including which features can be constructed as part of routine street projects.
- **T1.4.5.** Collaborate with schools, senior centers, advocacy groups, and public safety departments to provide community education about safe travel for pedestrians, bicyclists, public transportation riders, and others.
- **T1.4.6.** Use crime prevention through environmental design strategies to increase safety for pedestrians, bicyclists, and other users. *(*1)*
- **T1.4.7.** As necessary, public safety departments should engage in additional enforcement actions in strategic locations.

<u>Objective T1.5</u>: Make public transportation an interconnected part of the transportation network.

- **T1.5.1.** Partner with St. Joseph Transit to enhance and expand public transportation services and infrastructure throughout the MPO and coordinate with the surrounding region; encourage the development of a public transportation system that increases personal mobility and travel choices, conserves energy resources, preserves air quality, and fosters economic growth.
- **T1.5.2.** Work jointly with St. Joseph Transit to provide destinations and activities that can be reached by public transportation and are of interest to public transportation-dependent populations, including youth, older adults, and people with disabilities.

- **T1.5.3.** Collaborate with St. Joseph Transit to incorporate infrastructure to assist users in employing multiple means of transportation in a single trip in order to increase transportation access and flexibility; examples include, but are not limited to, provisions for bicycle access on public transportation, secure bicycle racks at transit stops, access via public transportation to trails and recreational locations, and so on.
- **T1.5.4.** Ensure safe and accessible pedestrian routes to public transportation stops; relocate stops if safe routes are not feasible at current location.
- **T1.5.5.** Work with St. Joseph Transit to ensure that public transportation facilities and vehicles are fully accessible to people with disabilities.
- **T1.5.6.** Explore working with St. Joseph Transit to provide travel training programs for older adults and people with disabilities, and awareness training for vehicle operators.
- **T1.5.7.** Explore creation of public transportation priority lanes to improve travel time.
- **T1.5.8.** Partner with St. Joseph Transit to collect data and establish performance standards related to these steps.

(*1). Crime prevention through environmental design (CPTED) involves designing the built environment to deter criminal behavior. CPTED aims to create environments that discourage the commission of crimes by influencing offenders to not commit a contemplated crime, usually due to increased fear of detection.

TRAILS
When, Where & Why

Everybody likes trails, so let us start with talking about them. There are many types of trails: recreational (wood chip or dirt surface), horse trails (same types), mountain bike (same types), and multi-use trails (concrete or asphalt surface). In the St. Joseph region, many such trail types exist and are being developed.

There are also designated trails including the Lewis & Clark Trail, Oregon-California Trail, American Discovery Trail, Great American Rail-Trail, and the Quad States Trail. These designations apply identifiers as way-finders for users interested in the alluded topic or re-trace historic events for modern interests.

Generally speaking, when one speaks of "trails" in the region, what is being described is the "Urban Trail", a concrete, multi-use, bi-directional pathway. Some experts would call the facility a "shared-use path", but for the purposes of this plan the urban trail shall mean a hard surface trail that is wide enough to serve both pedestrians and cyclists moving in two directions.

Although residents are familiar with the urban trail (with a concrete surface), there is nothing sacred about concrete and its relationship with the urban trail. The surface may be asphalt, or concrete, or crushed rock. The key element that brings the surface types together is not its construction, but its location: grade separated greenways or rail to trail conversions. Asphalt or concrete surfaces are more common in higher volume routes within urban centers and crushed rock surfaces are more common on lower volume routes or rural areas.

As will be highlighted throughout the plan, the Urban Trail System (grade separated greenway trails or rail-to-trail conversions) is intended to link existing and new bicycle and pedestrian systems, called the Non-Motorized Network. Utilizing the network, a resident could access sections of trail, sidewalk, shared lanes, or even bike lanes to reach a destination. Just as the interstate cannot take one all the way to a destination, the urban trail system may only be a minor component of the facilities in place to support the trip taken. This is the line between "just a trail" and "Complete Streets".

Trails, as one option for non-motorized modes, are appropriate in some instances and not in others. Outstanding design guidance is available in this regard from the American Society of Civil Engineers, AASHTO, and the Center for Livable Communities. The major recognition that is needed in many communities is that trails are NOT a good or safe replacement for standard sidewalks or bike facilities in all locations or in all situations. Trails, in fact, should generally make up a rather small percentage of the non-motorized network and an even smaller percentage of the overall mileage. Trails do and should connect to existing sidewalk systems when possible, not replace them. This plan is therefore a blueprint for what facility type should be constructed in a particular instance, why a design element should be selected instead of another option, and where the facility focus should be to develop an integrated system and network.

The Trail Map, contained in this document, is a system map that highlights corridors for trails. Future highway/street construction anticipated by the MPO should include sidewalks and bike elements as a result of capacity improvements, or simply bringing a road to a current standard, is presented on a separate map. Complete streets are utilized to make connections to the trails at various points throughout the system.

But - there are some road types that blur traditional lines. The plan highlights a special category of roadway that is envisioned to establish connections between St. Joseph's Parkway System. This particular category is special and warrant additional discussion.

System Components

Traditional system designations in the St. Joseph-Savannah-Wathena–Country Club-Elwood urbanized area consist of trails within greenways and "park-like" roadways. This plan formally recognizes the following components of the Urban Trail System:

1. "Parkway" or "boulevard" street typical sections (include both pedestrian and bicycle access in its design with special design features and landscaping)
2. 10' multi-use, bi-directional trails that provide a link to traditional sidewalk systems commonly called the urban trail; located in greenways.
3. Conservation Trails
4. Rails to Trails
5. Traditional sidewalk systems that link sections of the urban trail (connector streets).
6. Quad State Trail connections on the north and south of the metropolitan area (if off-road and part of Network if on-road).

CREATING SOMETHING SPECIAL
Historic Parkways & New Parkways

"Park-like" means many things to many people.

In St. Joseph proper, the community is fortunate to have established a 26-mile, curvilinear park system that connects the city from North to South. Within the larger park, which includes hundreds of acres of urban forest, are located pocket parks, ball fields, water features, urban trails, mountain bike trails, playgrounds, etc. These elements constitute the heart of the Parkway system.

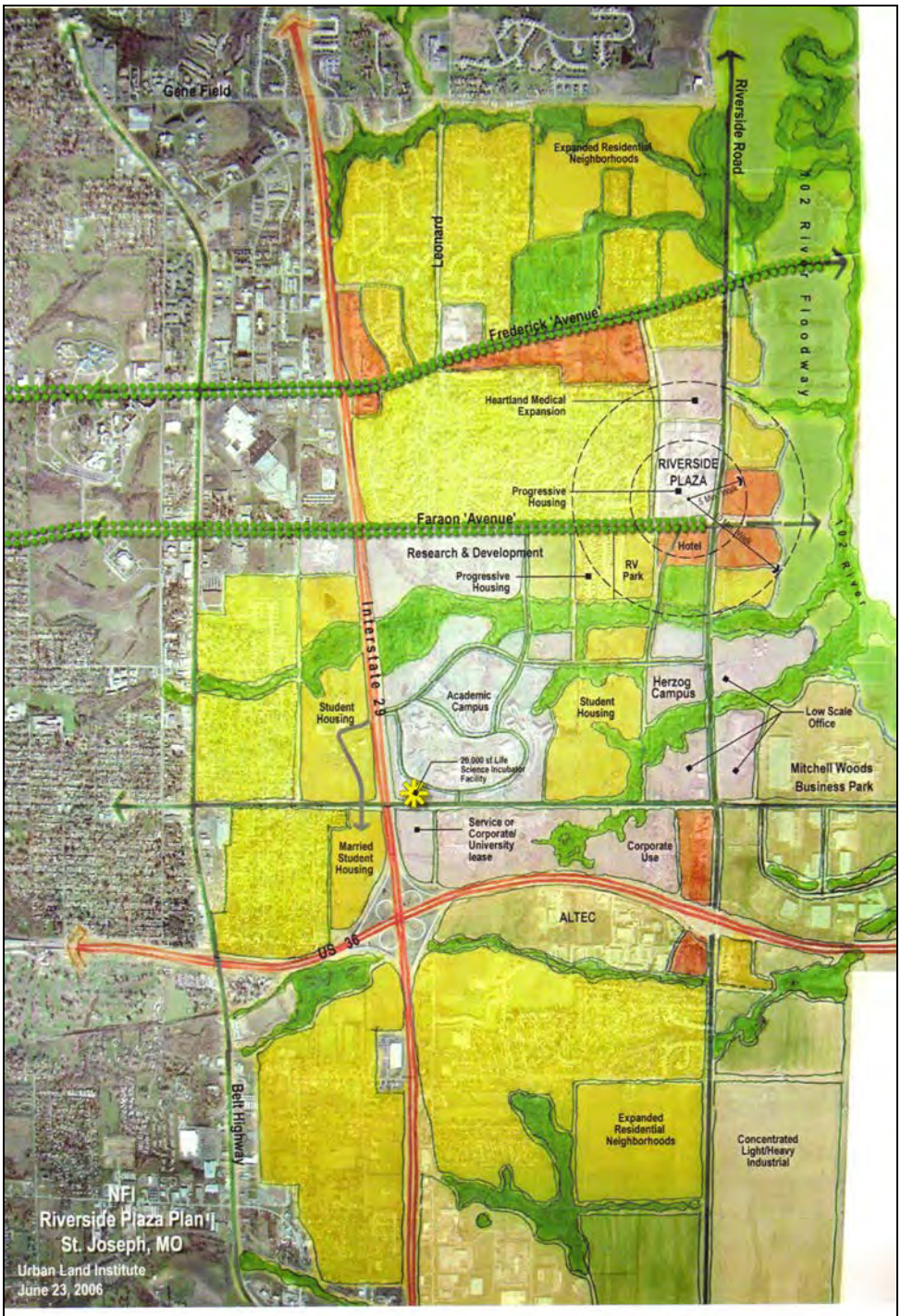
However, within the Parkway system is a roadway that provides motorists and on-road cyclists with a unique experience in the heart of the city. The roadway provides the access one needs to experience the Parkway, but the Parkway and the roadway are not one in the same. The road is not the Parkway but is an element of the Parkway. The Parkway itself is defined as a linear park that includes the elements already listed. That is what makes it unique in the United States.

The MPO, both in its 20 Year Metropolitan Transportation Plan (MTP) and the earlier iterations of this document, have designated certain corridors for "park-like treatment". What the term is intended to describe is a roadway designed in keeping with its functional classification designation, i.e., arterial or collector, as a basic, critical first step. This would carry forward with the number of lanes required to fulfill its role in the functional classification hierarchy. It could mean that a roadway would be built with a three or four lane section, but still be required to incorporate "park-like treatment".

During the last four decades planners have looked at where the Parkway could be extended. Unfortunately, many of the corridors identified did not obtain the necessary levels of staff or political support, until approximately 2007, to reasonably attain the goals of Parkway expansion, using the template established in the 1920's. Sections have been allowed to develop with multiple access points, shallow setbacks, and narrow rights-of-way, necessitating that a "new" old roadway prototype, that has a long history in the community, be re-applied to these corridors. The public lands that would have lined the Parkway extensions are now developed with yards and homes, eliminating the prospect of the urban forest associated with the original Parkway. As one examines the potential of a new Parkway, the roadway itself becomes the identifier and the larger context of the public lands within which the roadway functions falls away – but is not eliminated in total where land may still be available to partially extend the original vision.

One corridor that fits into this category is Riverside Road. It borders the 102 River and much of the property between the roadway and the river is floodplain, identified by the St. Joseph Parks Department as supporting suitable locations for new athletic fields in the future as well as the creation of another natural area much like the existing Parkway system. A study by the Urban Land Institute (ULI) suggests that the future roadway be re-constructed outside the normal as well; complimenting similar concepts of the 102 River floodplain being retained as a natural area, or a combination of natural areas and recreational areas.

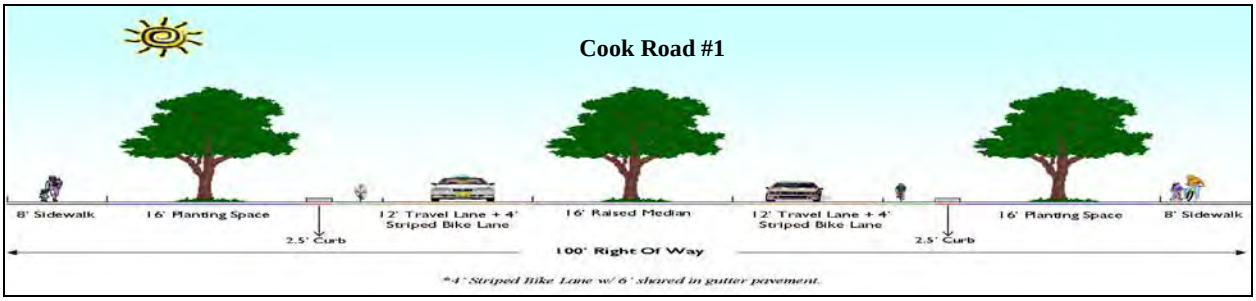
The ULI study is an important vision because it represents the coordinated agreement between the principal property owners within this corridor as well as the City of St. Joseph. It is positive that their shared vision is consistent with the new parkway concept, and is outlined in the following graphic:



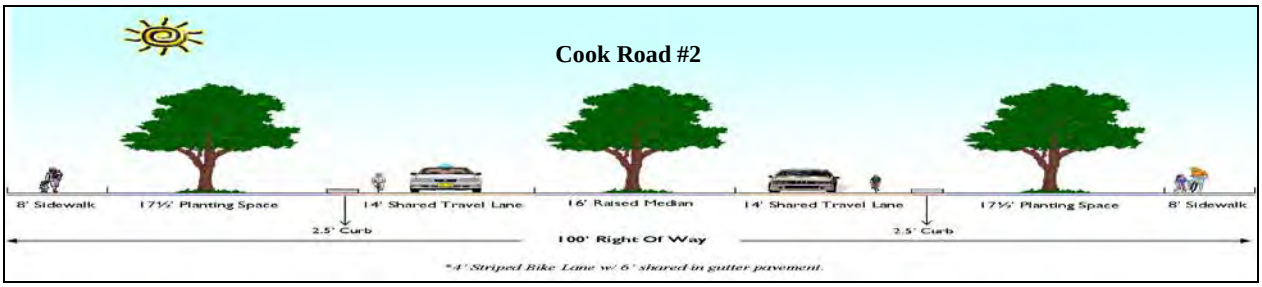
Riverside Plaza Plan

The current Riverside Road is largely comprised of a two-lane section, portions of which have shoulders, maintained by both the City of St. Joseph and the Missouri Department of Transportation. The future roadway plan calls for a four-lane, divided highway. However, to meet the park-like treatment requirement, the roadway would be designed with a typical section that would include four 12' travel lanes, 16' center turn lane (raised/landscaped median when turning movements for access points are not required), 2 ½' curb/gutter sections, 6' marked bike lane (6" of this width could utilize the gutter pavement), 25' of planting area for adequate space for large and mature trees, and 8' sidewalks, all of which would collectively require a 150' right of way:

Cook Road is another example. Currently a two-lane roadway with open ditches, the new roadway would require a 100' right of way in each of two design variants. The first would be two 12' travel lanes, 16' center turn lane (raised/landscaped median when turning movements for access points are not required), 4' bike lane (6" of gutter being used for width), 2 ½' curb and gutter section, 16' planting area for trees, and 8' sidewalks. Variant two would be largely the same but instead of marking a bike lane, the wide outside lane option could be used for a lane width of 14' to establish adequate width for a shared lane, which would result in a 17 ½' planting area. Both typical sections are shown as follows:



Or



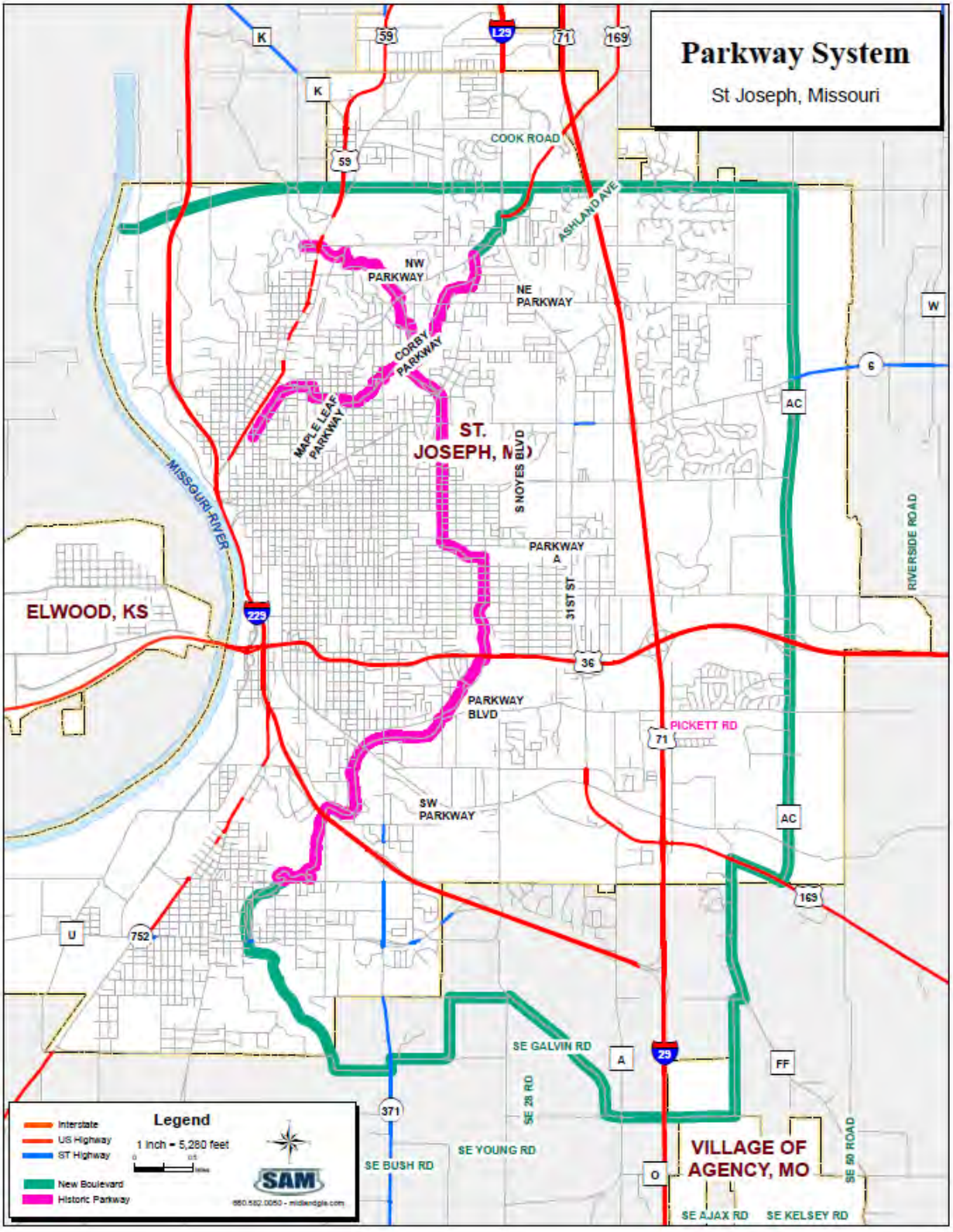
These variations in approach are not unique designs, nor are they new to the MPO or St. Joseph. The typical sections being described are commonly known as boulevards or avenues. Aside from what would now be called **Complete Streets**, or designs that appropriately **include all users** of the transportation system, these new boulevards would include features not common in most streets and would be located in much wider rights of way to accomplish that end.

In the urban area, Noyes Boulevard is a good example of a boulevard functioning as a collector or arterial in a residential area. In that case on-street parking is allowed, extra-wide lanes for biking, extra wide planting areas for large trees, and extra wide sidewalks were developed. Boulevards and avenues themselves represent good examples of "park-like treatment".

In St. Joseph, the facilities also <u>connect</u> the actual parkway system (a linear park that contains a curvilinear roadway, trails, natural areas, parks, and athletic fields). As one will note these streets are lined with homes and are not bordered with urban forest. This is the vision for corridors designated as "park-like treatment" or the new boulevard, as they will connect to the existing Parkway system to elements of future recreational opportunities outlined in ULI's "*Two Rivers Plan*". The plan has identified the relevance and potential of the natural features of the region, recommending extensions of the outer border of existing natural areas near these streams as public areas. To apply an appropriate street type designator, the "new parkway" shall be called "Boulevard".

Two Rivers Plan.

Two Rivers also falls into line with the same alignment of the new boulevard system, connecting the new public lands (with their future facilities) to the existing assets.


Parkway System
St Joseph, Missouri
COOK ROAD
ASHLAND AVE
NW PARKWAY
NE PARKWAY
CORBY PARKWAY
MAPLE LEAF PARKWAY
ST. JOSEPH, MO
S NOYES BLVD
MISSOURI RIVER
ELWOOD, KS
PARKWAY A
31ST ST
RIVERSIDE ROAD
PARKWAY BLVD
PICKETT RD
SW PARKWAY
SE GALVIN RD
SE 28 RD
SE YOUNG RD
SE BUSH RD
VILLAGE OF AGENCY, MO
SE 50 ROAD
SE AJAX RD
SE KELSEY RD
Legend
Interstate
US Highway
ST Highway
New Boulevard
Historic Parkway
1 inch = 5,280 feet
SAM

LET'S FOCUS
What Not to Do

To clarify, none of the typical sections established for Cook Road or Riverside Road would include a trail that would replace the traditional sidewalk system already discussed. Why?

As will be discussed further in this document, numerous driveways and street crossings make the deployment of a trail unsafe to the users of the system. With trails (bi-directional, grade separated facilities that operate in greenways [no conflicts], operational expectations are difficult to predict. A car backing out of a driveway would be exposed to the possibility of cyclists coming from either direction, at various rates of speed, before the vehicle operator enters traffic and is keeping a watchful eye. Cyclists also expect all traffic to yield to them on trails and do not have time to react when an oblivious operator enters onto their facility. The resulting conflict is a preventable one: do not deploy trails in place of sidewalks.

It is not needed either. With the inclusion of sidewalks, shared lanes, or bicycle lanes the need for a trail is not only unsafe, but duplicative.

It is possible that along Riverside Road, if at some point public lands are purchased along the 102 River, that a conservation trail system would be developed (or an extension of the urban trail) in the greenbelt created by the same and connect to the systems in place as part of the roadway, not to replace the systems contained within the roadways themselves. In areas with very wide rights-of-way, much like the existing Parkway, trails can operate safely if at-grade conflicts are minimized and significant setbacks from the roadway are in place for the majority of the trail. This exception applies to the urban trail being developed on the West side of Riverside Road at this time.

DEVELOPMENT AND RE-DEVELOPMENT
Complete Street Designs One Project at a Time

Issues of accommodation, inclusion type, and locations of improvements have been debated at the state and national levels for years. The St. Joseph metropolitan area has experienced intense debate with the Missouri Department of Transportation on this general theme and the City of St. Joseph reports the same with developers concerning designs that include all users as well. Progress is being experienced on many fronts with the conversation transforming from "why do I have to do it" to "what's the best place/way to design it?".

Much of the discussion pivots around one's definition of *right-of-way*. Regardless of the source, most authorities would agree that the following is a fair representation of the common definitions used today:

> **WAY - A passage, street, or road. A right of way is a privilege which an individual or a particular description of persons, such as the inhabitants of a particular place, or the owners or occupiers of such place may have, of going over another person's ground.**

Some jurisdictions argue that their rights-of-way cannot be used for purposes other than vehicular uses, which are in direct conflict with the basic definition that simply focuses on the right granted for a person to cross another person's property, not how they do it.

A secondary argument posed is that the definition of *highway* or *road* does not include non-motorized users, which means that road designs should not be inclusive by definition or that certain tax funds cannot be used. Merriam-Webster states:

> **ROAD - an open way for vehicles, persons, and animals; *especially*: one lying outside of an urban district**

> **HIGH·WAY - a public way; *especially*: a main direct road**

The challenge between the definition of terms and personal or organizational beliefs can best be described as one of perspective. On one hand, a project sponsor can say "I'm in the highway business and will include a sidewalk if you give me extra funding". On the other hand, is the prevailing perspective that complete design (that includes non-vehicular modes) is not "extra", and all projects should include a fully integrated approach to support all users of the transportation system. Put another way, the "Complete Streets" approach focuses upon designing streets to serve all users and should also include context sensitive support for and enhance the goals and objectives of the local community – not only move the most vehicles from point A-B at the highest rate of speed possible.

In other cases, an agency may be resistant to the construction of bicycle and pedestrian infrastructure even if it is not asked to fund them. This may be out of a concern for liability and evidenced through the imposition of construction requirements that may serve to artificially increase the cost of construction, therefore discouraging the initiative as a result.

In the News---

Belt Highway lacks safety infrastructure for pedestrians

By Quinn Ritzdorf News-Press NOW

Sandra Henderson was hit and killed by a car while trying to cross the South Belt Highway

Quinn Ritzdorf News-Press NOW

Three weeks ago, Sandra Henderson was hit and killed while trying to cross the South Belt Highway near Pickett Road. A little over a year earlier, a man suffered serious injuries in a pedestrian accident at the exact same location.

Multiple pedestrian accidents along the Belt Highway have led to safety concerns over one of the major roads that cut through St. Joseph.

Numerous restaurants, a bunch of shops, including two malls, and a plethora of gas stations all line the Belt and bring a lot of foot traffic, which the road isn't made for.

"There's not a sidewalk running from north to south," said Sgt. James Tonn of the St. Joseph Police Department. "There are blocks that have them and lots of blocks that don't. It'll be nice to have sidewalks for everyone, because we do have a lot of people that even though they walk in the grass, a lot of people walk right along the edge of the road or even right along the edge of the road in the roadway, which is just as dangerous."

Sandra Henderson's boyfriend, Timothy Comeau, said these pedestrian accidents happen because there aren't enough safety measures.

"There's no sidewalks," Comeau said. "You can't go down to the light when you're on a cane because there is a 4-foot drop-off of grass. She would have had to walk in the road to get down to the light because there's no sidewalk."

The Belt Highway is one of the busiest roads in St. Joseph in terms of traffic and storefronts. But after multiple accidents, it's clear the Belt isn't for pedestrians, at least not yet.

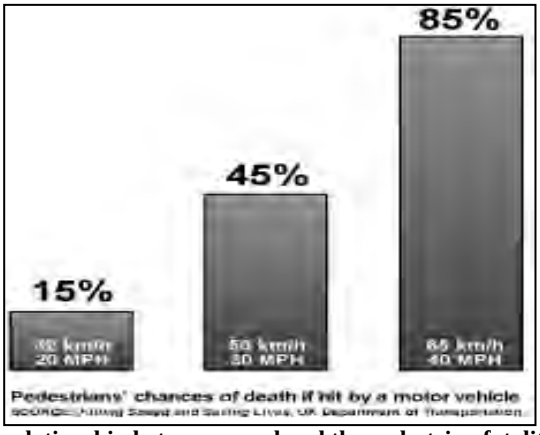
The goal should be to overcome such institutional barriers through education and the understanding that bikers and walkers are not "ghosts" on the transportation system. Users will walk or bike safely or unsafely in certain corridors, so it would not be responsible to fail to recognize and address the problem. As Hans Bleiker *Bleiker Consent Building* would say, "Is this a legitimate problem and would it be responsible of government not to address the problem if it is legitimate?"

SAFETY

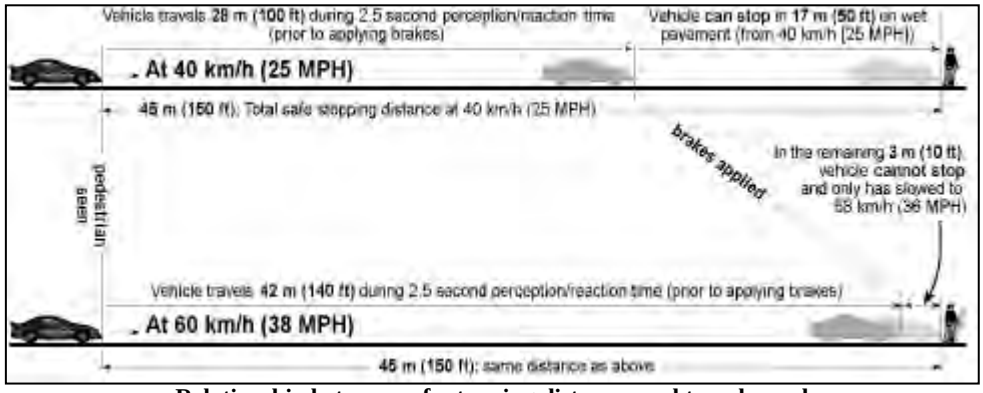
Defining the Problem

Compared to bicycle crashes, virtually all reported pedestrian crashes are the result of a collision with a motor vehicle. When a person trips and falls while walking, the resulting injury is rarely reported as a pedestrian crash. Most pedestrian crashes are the result of an attempt to cross a roadway; fewer occur as pedestrians walk along a roadway. While this document is aimed at both bicycle and pedestrian facility design, perhaps the pedestrian safety issue deserves special attention at the onset because of the historical inattention paid the subject over the last forty years.

Effective pedestrian safety programs should target behaviors that cause the majority of crashes. Analysis of pedestrian/motor vehicle crashes can help establish engineering, education, and enforcement solutions (the 3 E's). One important factor in all pedestrian crashes is speed. A study conducted in Great Britain (Killing Speed and Saving Lives) demonstrates a dramatic correlation between motor vehicle speeds and fatality rates.



The relationship between speed and the pedestrian fatality rate.



Relationship between safe stopping distances and travel speed.

Reducing traffic speeds not only reduces the severity of pedestrian crashes, but may reduce their occurrence, as slower speeds increase braking distances and reaction time. All engineering, education and enforcement programs should include reducing speeds as an important step. This does not necessarily mean reducing existing speed limits, as much as ensuring that the current limits are observed.

According to *National Strategies for Advancing Bicycle Safety* (4/24/01), a study completed by the National Highway Traffic Safety Administration, the National Center for Injury Prevention and Control, and the Federal Highway Administration, "about eighty-five million adults and children [27% of the nation's total population] ride their bikes every year. For children and teens, the bicycle is a primary means of transportation when traveling independently. Neighborhoods and communities where bicycle usage are not evident in the stated age groups are most often associated with physical barriers/lack of facilities rather than the interest or predisposition of the subject age groups to not bicycle.

Every morning an estimated half-million people bike to work in the United States. Each year, more than five hundred thousand bicyclists of all ages sustain a cycling injury that requires emergency room care. Of the approximately eight hundred bicyclists killed annually, about seven hundred and fifty are killed in traffic crashes. Perhaps not surprisingly, more than half of the bicyclists riding in or near traffic report feeling unsafe.

In a nation where traffic is increasing and roadways are becoming more congested, a community must, to the best of its collective ability, ensure the safety of *all* roadway users.

Long-term Trends

The number and severity of pedestrian crashes could rise in the future due to an unintentional consequence of cars being built with more safety features: as drivers and passengers are better protected within their vehicles, and further isolated from the outside world (with quiet interiors and improved sound systems), the unprotected pedestrian will not be noticed or perceived as a threat. Add to that advances in technology and the evolving autonomous driving vehicle, the non-motorized user is increasingly separated from the engaged and observant vehicle operator. This could lead to pedestrians being invisible to or ignored by motorists.

Pedestrian fatalities have been on the rise the last few years. Current plans in Missouri and Kansas do not include safety elements and goals that focus upon non-motorized movements and are encouraged to expand upon the mode, that while less in frequency than motorized accidents, are much more likely to fatalities as a percentage of overall conflicts.

Pedestrian/motor vehicle Crashes

There are approximately 700-800 pedestrian injury crashes reported each year in most states. Of these, approximately 60-80% are fatal (+/-10%). Some characteristics follow:

- 80% of the crashes occur in urban areas.
- 80% occur as a pedestrian crosses a street.

- Of the crossing accidents, 50% occur at mid-block locations.
- Of the crossings that occur at intersections, about half are at signalized intersections, and half are at non-signalized intersections.
- In 90% of the intersection crashes, the pedestrian was in a crosswalk.
- At signalized intersections, in 65% of the crashes, the pedestrian was crossing with the signal.

The turning movements of motor vehicles in intersection crashes were:

- Motor vehicle going straight: 50%
- Motor vehicle turning: 50% (63% turning left, 37% turning right)

Most safety efforts should be aimed at crossing movements; greater education of motorists is necessary to make them aware of the rights of pedestrians and proper design that reinforces the physical dynamics of the driver's ability to identify pedestrians is required for new roadway projects.

Planning & Engineering Solutions

Although some pedestrian/motor vehicle crashes are caused by improper behavior, many improvements can be made to roads to reduce the potential for crashes. If facilities are well designed and pedestrians and motorists use them correctly, the likelihood of crashes will decrease.

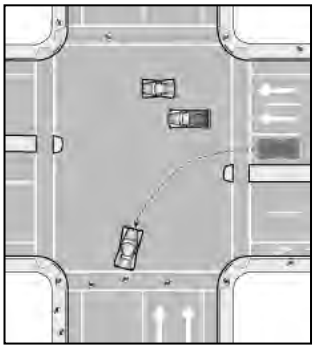
The most important step that jurisdictions can take is to design bicycle and pedestrian facilities that enable motorists to clearly see users along the roadway and those preparing to cross the roadway. Users must be given opportunities to cross roadways with minimal conflicts with motor vehicles.

Pedestrian Walking along the Roadway

- The addition of sidewalks in urban areas and wider shoulders in rural areas are the preferred treatments.
- Sidewalks separated from traffic with planter strips increase pedestrian safety.

Pedestrian Crossing at Intersection

- Shortening the total distance to be crossed decreases the exposure time; techniques include curb extensions, median islands, and islands at complicated turn movements.
- Placement of signs reminding motorists of their duty to yield to pedestrians when they turn left or right can help improve awareness of the pedestrian's right of way.
- Illumination can improve visibility of pedestrians under nighttime conditions.
- Improved marking of crosswalks enhances their visibility.

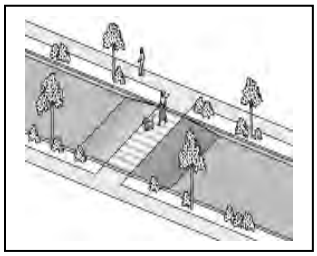


Left-turning vehicle & Pedestrian conflict

Pedestrian Crossing Outside an Intersection

- On wide, multiple lane roads, a center median improves crossing opportunities: a pedestrian only has to concentrate on traffic coming from one direction at a time, as the median provides a refuge.
- Mid-block curb extensions can reduce crossing distance and improve the visibility of pedestrians waiting to cross.
- Illumination improves the visibility of pedestrians under nighttime conditions.
- Improved marking of crosswalks enhances their visibility.

Motorist Speeding



Though this is usually considered an enforcement issue, there are many roadway design features that influence the speed at which motorists drive - motorists will usually travel at speeds that seem appropriate for the roadway.

Traffic calming measures can be used on local streets and minor collectors. On arterials and major collectors, there are features that can be incorporated that discourage excessive speeds: trees along the road, narrower lanes, landscaping, bike lanes, etc.

Education Solutions

Many pedestrian crashes are due to the ignorance of the rules pertaining to the right-of-way. A recent study conducted by the AAA revealed that nearly 50% of Americans do not know some of the basic laws as applied to pedestrians. More information should be made available to motorists, so they know that pedestrians have the right-of-way at crosswalks, *both marked and unmarked.*

The consequences of excessive travel speeds must be made known to the motorists; many do not understand that traveling above the speed limit in residential areas can result in a fatal pedestrian or cyclist crash.

Pedestrians must know how to safely cross streets. It should never be assumed that a signal guarantees safety; one should always look before crossing. The meaning of "WALK/DON'T WALK" signals is not clearly understood by all (the white WALK phase of a signal is a time during which pedestrians may begin to enter the crosswalk; the flashing red DON'T WALK phase indicates that pedestrians in the crosswalk may safely proceed across the street, but pedestrians approaching the intersection should wait).

Though there are many situations in which the pedestrian is technically at fault (e.g. mid-block dart out), more emphasis needs to be placed on the driver's responsibility, since he or she is the one moving in a high-speed, heavy vehicle.

Enforcement Solutions

Along with education, increased enforcement can have the greatest effect on safety. The lack of consequences to motorists who run lights and stop signs or fail to yield at crosswalks is

mostly due to the insufficient numbers of law enforcement officers dedicated to traffic enforcement.

Increased education efforts aimed at law enforcement officers can help them understand the severity of pedestrian infractions. An effective program in Seattle combined increased citation of motorists at crosswalks with extensive media coverage. The result was a dramatic decrease in the number of pedestrian crashes following these efforts.


Genefield & Woodbine

Attitudes towards the relative severity of pedestrian crashes need to change among prosecutors and judges. Motorists often get off fairly lightly following crashes that result in pedestrian injuries or deaths. The pedestrian is often assumed to be partially at fault for simply "being in the road." The consequences of failing to yield to pedestrians need to be more severe and better publicized for motorists to change behavior.

NETWORK USERS
How Defined

Cyclists and pedestrians, and how each level of user is categorized, are defined by many different methods. Depending upon skill level, comfort of facility, and age, different users will operate differently and select facilities for their use individually. The most common definitions are as follows:

Cyclists-

Class 1 – Advanced or Experienced riders are generally using their bicycles as they would a motor vehicle. They are riding for convenience and speed and want direct access to destinations with a minimum of detour or delay. They are typically comfortable riding with motor vehicle traffic; however, they need sufficient operating space on the traveled way or shoulder to eliminate the need for themselves or a passing motor vehicle to shift position.

Class 2 – Basic or Less Confident adult riders may also be using their bicycles for transportation purposes, e.g., to get to the store or to visit friends, but prefer to avoid roads with fast and busy motor vehicle traffic unless there is ample roadway width to allow easy overtaking by faster motor vehicles. Thus, basic riders are comfortable riding on neighborhood streets and trails and prefer designated facilities such as bike lanes or wide shoulder lanes on busier streets.

Class 3 – Children, riding on their own or with their parents, may not travel as fast as their adult counterparts but still require access to key destinations in their community, such as schools, convenience stores and recreational facilities. Residential streets with low motor vehicle speeds, linked with trails and busier streets with well-defined pavement markings between bicycles and motor vehicles, can accommodate children without encouraging them to ride in the travel lane of major arterials.

Pedestrians-

The *child pedestrian*, 14 years of age or younger, shares many of the characteristics of the Class 2 cyclist. Supervision is often needed in heavier traffic. Children are limited to walking to areas in their immediate neighborhood whether it is for social interaction or errands for the family.

The *recreational pedestrian* may be of all ages. This group tends to utilize pedestrian facilities, such as sidewalks and trails whenever available to minimize potential vehicular conflict and improve the overall experience. A common activity shared by the recreational pedestrian is often the family walk.

The *fitness pedestrian* can be adults of all ages. This group ranges from joggers and competitive runners to senior citizens walking for health purposes. Fitness pedestrians typically exercise on a frequent basis. Consequently, they are more experienced in handling traffic conditions. Senior citizens also may utilize walks or trails with limited conflict.

The *utilitarian pedestrian* is of all ages as well. Utilitarian pedestrians walk or jog with a specific destination in mind, such as work, school, or shopping areas. For people without automobiles, walking may be their only source of transportation. Walking may be combined with other forms of public transportation.

The wisdom of recognizing different types and user levels in design is not to simply provide facilities for one group instead of another, but to make one aware that sometimes a single accommodation may not be serving users adequately, or all users safely. Many times, a multi-faceted approach is needed depending upon the community/neighborhood/corridor in question.

The *commuter* is a person that walks or bikes to work or school on a daily basis. While one could argue that commuting is a trip purpose and not a type of user, the use is distinctive enough to represent specific mention. Commuter skill levels vary as already outlined, but are compounded because the activity is repeated on a daily basis, to a consistent location. Commuter trips can often involve public transportation in the overall trip, perhaps beginning or terminating on a transit vehicle. This classification of user is the critical area that focused upon for growth because its development has the most direct correlation to a significant reduction of motor vehicle trips.

TRIP PURPOSE, LAND USE & ITS IMPACT ON DESIGN
What Facilities - Where

Many authorities on the subject of bicycle and pedestrian transportation focus upon the purpose of the trip. The concept is that the needs of non-motorized modes differ in direct relationship to whether the trip is recreational, work, or other. If the purpose can be determined, then the appropriate design needed can be understood.

In practical application, trip purpose could be tied to the same concepts applied to the functional classification of a roadway. That is, treatments in some areas should not be as extensive in some areas as in others (i.e. bike lanes may not be required on residential streets).

In a typical neighborhood the minimum approach from the toolkit would be applied: sidewalks on both sides and bike traffic sharing space within automobile travel lanes and spaces for on-street parking. On a collector street, one would include a wider sidewalk along with a wider automobile lane to more efficiently and safely "share" the lane with bikers. On an arterial, a wider sidewalk would be constructed and either a shared lane or a bicycle lane provided.

Land use is the factor that would most greatly impact the sidewalk width along any street. For example, retail areas typically attract more pedestrian traffic and therefore would require a wider sidewalk to accommodate the traffic. Restaurants and retail areas also typically desire to utilize the public sidewalk to display products or provide for outside dining. Such uses should be encouraged but should also be anticipated in the design of the sidewalk facility that supports the use: a wider sidewalk.

Factors Influencing Walking & Biking

As cited in the Rudin Center's 2006 report, FHWA identifies a three-tiered hierarchy of factors that may influence a person's decision to walk or bike, rather than using another mode of transport.

The first set of factors is grouped under the first tier in the hierarchy: initial considerations. This would include such elements as habits of relying upon driving for short trips, distances involved in trips, individual attitudes and values, perceptions and misperceptions related to safety, individual capabilities, and situational constraints.

The second group of factors involves trip barriers. In this case, even if a person would prefer to walk, it may be difficult to do so. Actual safety problems are a key concern for this factor. Also, in this category of factors are access and linkage difficulties as well as the directness of the route, or direct path.

Direct path is a principal that recognizes that individuals will not travel further, or out of their way, if there is a quicker or more direct link to their destination. Especially for pedestrians, directness has a direct upon other factors including initial considerations and environment.

For example, if a walker sees that the direct path from point A to B is a short distance and will take X amount of time to reach, the walker will decide whether to make that trip based upon an evaluation of this criteria. If the same walker has to choose between a route that is closest (without designed facilities) versus another path (with designed facilities), most walkers will choose the closest route. Why? Because it is closer and takes less time.

There are several great examples in the region that illustrate these points. Observe the campus of Missouri Western State University. The campus itself provides no sidewalks along the circular roadway internal to the grounds itself but does provide sidewalks to and from the facilities on the campus itself. However, one will quickly note that students at some locations do not use the sidewalks in place because to use them lies outside the direct path. Some of these sidewalks slowly circle around the grounds and generally head to other buildings. Shortcuts from these sidewalks are evidenced by worn, foot paths between various buildings where students have chosen to walk based upon the shortest path, not whether the sidewalks that take the walker way out of the way are there or not. Some of the extant sidewalks may have been located where they are for aesthetics instead of pedestrian utility.


Buchanan Co. Courthouse

Shoppes at North Village is another more recent example. Developers had explained to the City of St. Joseph that the need for sidewalks on the east side of the Belt Highway would not be needed. Why? The development provided an internal sidewalk network that could be used. Tt was felt the sidewalks on its frontage would not be needed as a result. This decision ignored the principal of direct path. Since the development completed its construction, walkers have not chosen to take a curvilinear path through the development if their destination were at a spot where it could be reached more quickly or directly. The evidence will show that a large number of walkers in the Shoppes area walk on the east shoulder of the Belt Highway or the sidewalk on the west and then leave it at the appropriate point where they utilize the internal system. Users in this development would often respond that the development itself is walkable, but it left out the infrastructure necessary to link to the surrounding community.

The point of these two examples is that one cannot build infrastructure in one location and expect the concept of direct path to be ignored. The option of "let's save money and build it here instead of there" only leads to additional foot paths as walkers will continue to walk where it is easiest and shortest to walk. Facilities have to be constructed at the correct location.

Automobiles are little different, with scores of research and source material discussing "cut-thru" traffic and other operational characteristics that relate to the causes of the "direct path syndrome" on traffic. The common denominator between walking, biking, and the automobile is that people like to reach their destination quickly. Human tolerance for the degree of detour varies by mode.

The third group of factors is environmental, such as steep hills or extreme temperatures that may change a person's mind about the trip option. This factor is subjective and varies widely by region. For example, residents of Colorado Springs, Colorado enjoy some of the most progressive, non-motorized policies and facilities in the Midwest, but the hilly topography and

climate that is found acceptable by residents there may not be in another location. "Steep", "cold", and "hot" mean different things to different people in different locations.

Trip Purpose

Trip purpose for non-motorized traffic would logically mimic that of motorized traffic. If a common destination along a given street is the mall, then non-motorized traffic would likely be similar along the same route. An observation of many experts in the field has been that the vast majority of trips on facilities within neighborhoods is of short duration (two blocks), but longer in other corridors depending upon functional class and adjoining land use (i.e. commercial or retail vs. residential).

Perhaps the most effective method of analyzing trip type is to do so by turning the table around by focusing not upon where the user is going, but instead upon what's in the area that would attract traffic – much as a traffic model uses the concept of generators and attractors.

As a practical matter a large percentage of walkers will not travel over a certain distance to a job or for certain types of shopping, whether that measure is established at one mile or four miles. Given this assumption, perhaps it would be more accurate to focus upon trip types as they correspond to land use activity.

For example, facilities on the Belt Highway (largely retail) will likely carry a predominant percentage of users whose trip purpose is shopping. For those individuals that live within a personally determined, feasible proximity to their workplace, some of the users may use the same for a means to travel to and from work.

In retail areas where facilities are extant, the trip is often of short duration. Perhaps it is a short walk to investigate the price of a product at Game Stop and then a competitor at East Hills Mall. The ability to access each site without having to drive the automobile reduces stress on the roadway system but results in a trip purpose that is short in duration and classified as "other" in type.

In a region where accommodations are inconsistent at best, with miles of community that entirely lack appropriate facilities terminating in sections that do, it is difficult to apply professionally recognized criteria to determine where people walk/bike and for what purpose. At present the system is too disconnected for an objective analysis, but over time it may be possible to apply traditional approaches toward monitoring use and purpose. The fact is that people are walking - and walking a lot.

As an interim plan toward data gathering, the MPO has been coordinating with community volunteers to conduct bicycle and pedestrian traffic counts at various locations. Some locations have facilities, while others do not. Yet other locations had facilities constructed after data collection began in 2015. Some locations do not have facilities but are located a distance from other locations that do. The value of selecting a mix of location types is that one can begin to understand the level of activity with and without facilities and establish a baseline for statistical

tracking over time. The data is collected using the protocols established by the National Bicycle and Pedestrian Documentation Project. The results from recent counts are as follows:

Bike/Ped Locations	Facility	Avg Daily 2015	Avg Daily 2016	Avg Daily 2017	Avg Daily 2018
Belt & Cook	Intersection	58	250	268	241
22nd St. & Frederick	Intersection	60	318	176	521
Belt & Frederick	Intersection	38	259	107	161
Gene Field between Woodbine &I-29	Intersection	15	9	18	57
22nd St. & Faraon	Intersection			176	259
Urban Trail & NW Parkway near pedestrian bridge	Trail	221	554	655	565
Noyes Blvd. near Central High school and Tennis Courts	Trail	92		631	646
St. Joseph Avenue near Krug Park	Trail	43	232	262	292
Ashland Avenue near Beck	Trail	155	607	449	405
Riverfront Trail	Trail	139	1,122	1,071	952
Urban Trail near Commercial	Trail	147	500	613	554

Lacking such data, common sense must prevail to determine trip purpose. Depending upon the nature of the generator and the attractor, it is generally accurate to associate the trip purpose with the adjacent land use adjacent to roadway classifications of collector and local streets. One could assume that arterials would also have a general association with the land use, but also such corridors support a strong relationship in providing connections to and from areas served by the collector and local street, as would be expected with the function of an arterial. One thing is certain; all logic breaks down when there are no connections and no facilities.

OBJECTIVE MEASURES FOR PROJECT SELECTION
Making the Case

Policy statements are common in Complete Streets plans because they often contain guidelines that can be used in decision making. But guidelines are interpreted as a voluntary measure when those affected do not agree with the subject matter. To clarify, the following information is a flexible requirement for project selection within the MPO and by units of government that have adopted this Complete Streets plan.

1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects throughout the metropolitan area, unless one or more of three conditions are met:

A. Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right-of-way or within the same transportation corridor (interstates).

B. The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use, as determined by the MPO. Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project, exclusive of right-of-way and engineering costs for new construction.

C. Where sparsity of population indicates an absence of need or the street has severe topographic or natural resource constraints. This provision does not mean that planning and constructing improvements for all users in-advance of development shall exempt a project from including a complete design based upon the density of land use in place at the time. Designing and building improvements that support all users in-advance of other planned improvements or development represents a sound investment of infrastructure resources and is encouraged.

2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day. In conservation design subdivisions, “bike friendly” lanes may be provided in lieu of other accommodations such as interior sidewalks. These treatments have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate.

Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate. The exact location of the rumble strip in relation to the automobile travel lane may be determined by the agency concerned until such time that sufficient research has been completed to indicate safe placement of this safety feature at a national level.

3. Sidewalks, shared use paths, street crossings (including over and under crossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, can travel safely and independently. For all citizens, Title VI, Environmental Justice, and ADA populations, the Americans with Disabilities Act Standards design shall be in compliance with guidance set forth by the Americans with Disabilities Act Accessibility

Guidelines (ADAAG), *Designing Sidewalks and Trails for Access* and its successor updates/revisions.

4. The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

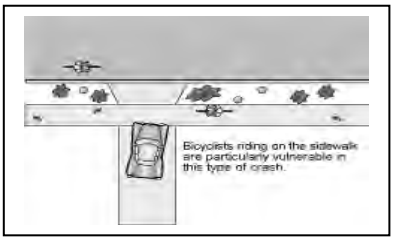
- Planning projects for the long-term. Transportation facilities are long-term investments that remain in place for many years. The design and construction of new facilities shall anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years might be built with sufficient width for safe, non-motorized use in anticipation that facilities will be available at either end of the bridge, even if that is not the existing condition. This shall also include major maintenance projects to bridges, including bridge deck replacements. Bridge decks are a special category of maintenance because of the impact a project can have in providing access and the useful life of the improvement itself (30 years +).
- Addressing the need for bicyclists, pedestrians, and disabled populations to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, users need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible, and convenient.
- Designing facilities to the best currently available standards and guidelines. The design of facilities for bicyclists and pedestrians shall follow design guidelines and standards that are commonly used, such as the ITE Recommended Practice *Design and Safety of Pedestrian Facilities*, AASHTO *Guide for the Development of Bicycle Facilities*, and AASHTO's *A Policy on Geometric Design of Highway and Streets*. Where these standards are in conflict with the Americans with Disabilities Act Accessibility Guidelines (ADAAG), *Designing Sidewalks and Trails for Access*, the ADAAG shall have precedence. However, except in the case of ADA standards, the standards set forth in this document shall have precedence, followed in descending order by the remaining citations listed in this paragraph in the order listed.

THE IMPORTANCE OF GOOD DESIGN
Everything Has Its Place

If all traffic- cars, trucks, bikes, and pedestrians- moved at similar speeds, then a wide shared avenue would work. The reality is that each mode operates at its own speed. Therefore, separation of cars, bikes, and people are essential in most places. The separation pattern requires a car place, a bike place, and a pedestrian place. Trees providing shade and green, street furniture, and buffers must be factored in where appropriate.

How Many Sidewalks Are Needed?

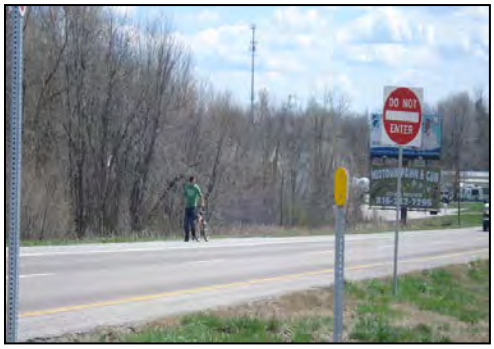
When it comes to funding, the omission of a sidewalk can be a big and costly mistake. A total lack of sidewalks in a place keeps motorists and pedestrians on their toes, and conflicts at a maximum. Children, older adults, and people with disabilities may not be able to move at all. Sidewalks on one street side show only favoritism and creates conflicts. It also begs the question: "Which side is the 'right' side?" Equally sized sidewalks (in areas of similar land use on both sides of the street) on both sides of the street provide essential property buffers and complete the fundamental architecture of the street.



Mixing "trails" and sidewalks on a street places the young biker wanting to ride the "trail" in conflict with the motor vehicle when crossing the street to access the facility. It also exposes the pedestrian on the trail to greater risks with the increase in youth biking by concentrating such use on a single side of the street, not to mention that the cyclist/automobile conflicts on trails built next to a street expose both to a much higher incidence of collision and serious injury.

Well-designed bicycle and pedestrian elements of a design are safe, attractive, convenient, and easy to use. It is costly to plan, design and build a facility that is little used, or is used irresponsibly because of poor design.

Bicycle and pedestrian facilities must be considered at the inception of transportation projects and incorporated into the total design, so that potential conflicts with the safety and level of service for various modes are resolved early on. Bikeways and walkways may be under-designed if they are considered add-on features.



Good design cannot solve all safety problems: enforcement and education are needed to make all road users aware of the presence of others.

FACILITY TYPES
What Type of Bike Facility is Needed - Where?

Bicycles are legally classified as vehicles and are ridden on most public roads in Missouri and Kansas that are open to bicycle traffic, with a few exceptions (interstates). Roadways, which are defined as including the automobile travel lanes to the back edge of the sidewalk, must be designed to allow bicyclists to ride in a manner consistent with the vehicle code.

A bikeway is created when a road has the appropriate design to support bicyclists, based on motor vehicle traffic volumes and speed. The basic design approaches used for bicycle travel on the road are shared roadway, shoulder bikeway, or bike lane. Another type of facility is separated from the roadway: multi-use path.

SHARED ROADWAY - On a shared roadway, bicyclists and motorists share the same travel lanes. A motorist will usually have to cross over into the adjacent travel lane to pass a cyclist. Shared roadways are common on neighborhood streets and on rural roads and highways. There are two treatments that enhance shared roadways for cyclists:

- Wide Outside Lane — Where shoulder bikeways or bike lanes are warranted but cannot be provided due to severe physical constraints, a wide outside lane may be provided to accommodate bicycle travel. A wide lane usually allows an average size motor vehicle to pass a bicyclist without crossing over into the adjacent lane.
- Bicycle Boulevards — A modification of the operation of a local street to function as a through street for bicycles while maintaining local access for automobiles. Traffic calming devices control traffic speeds and discourage through trips by automobiles. Traffic controls limit conflicts between automobiles and bicycles and give priority to through bicycle movement.

SHOULDER BIKEWAY - Paved roadway shoulders on rural roadways provide a suitable area for bicycling, with few conflicts with faster moving motor vehicle traffic. Most rural bicycle travel on the state highway system could be accommodated on shoulder bikeways. AASHTO has supported the concept of shoulders for rural roadways for some time in the areas of safety, capacity, and maintenance.

Safety- highways with paved shoulders have lower accident rates as paved shoulders:

- Provide space to make evasive maneuvers;
- Accommodate driver error;
- Add a recovery area to regain control of a vehicle, as well as lateral clearance to roadside objects such as guardrail, signs and poles (highways require a “clear zone”, and paved shoulders offer the best recoverable surface);
- Provide space for disabled vehicles to stop or drive slowly;
- Provide increased sign distance for through vehicles and for vehicles entering the roadway (*rural*: in cut sections or brushy areas; *urban*: in areas with many sight obstructions);
- Contribute to driving ease and reduced driver strain;
- Reduce passing conflicts between motor vehicles and cyclists and pedestrians;
- Make the crossing pedestrian more visible to motorists; and

- Provide for storm water discharge farther from the travel lanes, reducing hydroplaning, splash and spray to following vehicles, pedestrians and cyclists.

Capacity- highways with paved shoulders can carry more traffic, as paved shoulders:

- Provide more intersection and safe stopping sight distance;
- Allow for easier exiting from travel lanes to side streets and roads (also a safety benefit);
- Provide greater effective turning radius for trucks;
- Provide space for off-tracking of truck's rear wheels in curved sections;
- Provide space for disabled vehicles, mail delivery and bus stops; and
- Provide space for cyclists to ride at their own pace.

Maintenance- highways with paved shoulders are easier to maintain, as paved shoulders:

- Provide structural support to the pavement;
- Discharge water further from the travel lanes, reducing the undermining of the base and subgrade;
- Provide space for maintenance operations and snow storage;
- Provide space for portable maintenance signs; and
- Facilitate painting of fog lines.

BIKE LANE - A portion of the roadway designated for preferential use by bicyclists. Bike lanes are appropriate on urban arterials and major collectors. They may be appropriate in rural areas where bicycle travel and demand is substantial. Bike lanes must always be well marked to call attention to their preferential use by bicyclists. Many of the benefits of shoulders also apply to bike lanes in urban areas, whether they were created by re-striping or by widening the road. Some street enhancements cannot be measured with numbers alone, as they offer values (i.e. trees) that simply make a community better. The following information should be viewed in this context:

For Pedestrians-

- Greater separation from traffic, especially in the absence of on-street parking or a planter strip, increasing comfort and safety. This is important to young children walking, playing or riding their bikes on curbside sidewalks;
- Reduced splash from vehicles passing through puddles (a total elimination of splash where puddles are completely contained within the bike lane);
- An area for people in wheelchairs to walk where there are no sidewalks, or where sidewalks are in poor repair or do not meet ADA standards;
- A space for wheelchair users to turn on and off curb cut ramps away from moving traffic;
- The opportunity to use tighter corner radii, which reduces intersection crossing distance and tends to slow turning vehicles; and
- In dry climates, a reduction in dust raised by passing vehicles, as they drive further from unpaved surfaces.

For Motorists-

- Greater ease and more opportunities to exit from driveways (thanks to improved sight distance);

- Greater effective turning radius at corners and driveways, allowing large vehicles to turn into side streets without off-tracking onto curb;
- A buffer for parked cars, making it easier for motorists to park, enter and exit vehicles safely and efficiently. This requires a wide enough bike lane so bicyclists aren't "doored"; and
- Less wear and tear of the pavement, if bike lanes are restriped by moving travel lanes (heavier vehicles no longer travel in the same, well-worn ruts).

For Other Modes-

- Transit: A place to pull over next to the curb, out of the traffic stream;
- Delivery vehicles (including postal service): A place to stop out of the traffic stream;
- Emergency vehicles: Room to maneuver around stopped traffic, decreasing response time;
- Bicyclists: Greater acceptance of people bicycling on the road, as motorists are reminded that they are not the only roadway users;
- Non-motorized modes: An increase in use, by increasing comfort to both pedestrians and bicyclists (this could leave more space for motorists driving and parking).

For the Community (Livability factors)-

- A traffic calming effect when the bike lanes are striped by narrowing travel lanes;
- Better definition of travel lanes where road is wide (lessens the "sea of asphalt" look); and
- An improved buffer to trees, allowing greater plantings of green canopies, which also has a traffic calming effect.

MULTI-USE OR SHARED-USE PATH (previously called "Bike Path" or "trail") - A facility separated from motor vehicle traffic by a **very wide** open space or barrier, either within the roadway right-of-way or within an independent right-of-way. These are typically used by pedestrians, joggers, skaters, and bicyclists as two-way facilities. Multi-use paths are appropriate in corridors not well served by the street system (if there are few intersecting roadways), to create short cuts that link destination and origin points, a shortcut between neighborhoods (two cul-de-sac streets), and as elements of a community trail plan along greenways and railroad corridors. They represent limited use applications that would be the exception for design inclusion, not the rule. Trail systems are not solely comprised of "trails" but will link with and connect to traditional sidewalk networks where present. Thus, a trail network may be signed from point X to Y, but the trail itself would be comprised of multi-use trail sections through greenways, sections of traditional sidewalk, and perhaps back to multi-use trail. The concept is integration and connectivity, not a stand-alone system akin to that of an interstate highway.

According to AASHTO, trails should be thought of as a complementary system of off-road transportation routes for cyclists and pedestrians that serve as a necessary extension to the roadway network. Shared use paths should not be used to preclude on-road bicycle facilities, but rather to supplement a system of on-road bike lanes, wide outside lands, paved shoulders, bike routes, and sidewalks.

When two-way trails are located immediately adjacent to a roadway, some operational problems are likely to occur. In some cases, paths along highways for short sections are permissible, given an appropriate level of separation between facilities (possibly a curb, wide planter strip and a fence).

Problems with paths located immediately adjacent to roadways are as follows (AASHTO, 2018):

- Unless separated, they require one direction of cycling traffic to ride against motor vehicle traffic, contrary to normal rules of the road.
- When the path ends, cyclists going against traffic will tend to continue to travel on the wrong side of the street. Likewise, cyclists approaching a trail often travel on the wrong side of the street in getting to the path. Wrong-way travel by cyclists is a major cause of bicycle/automobile crashes and should be discouraged at every opportunity.
- At intersections, motorists entering or crossing the roadway often will not notice cyclists approaching from their right, as they are not expecting contra-flow vehicles. Motorists turning to exit the roadway may likewise fail to notice the cyclists. Even cyclists coming from the left often go unnoticed, especially when sight distances are limited.
- Signs posted for roadway users are backwards for contra-flow bike traffic; therefore, these cyclists are unable to read the information without stopping and turning around.
- When the available right-of-way (ROW) is too narrow to accommodate all highway and shared use path features, it may be prudent to consider a reduction of the existing or proposed widths of the various roadway (and bikeway) cross-sectional elements (i.e. lane and shoulder widths, etc.--). However, any reduction to less than AASHTO (or other applicable design criteria cited in this document) design criteria must be supported by a documented planning and engineering analysis.
- Many cyclists will use the roadway instead of the shared use path because they have found the roadway to be more convenient, better maintained, or safer. Some motorists, who feel that in all cases cyclists should be on the adjacent path, may harass cyclists using the roadway.
- Although the trail should be given the same priority through intersections as the parallel roadway, motorists falsely expect cyclists to stop or yield at all cross-streets and driveways. Efforts to require or encourage cyclists to yield or stop at each cross-street and driveway are inappropriate and frequently ignored by cyclists.
- Stopped cross-street motor vehicle traffic or vehicles exiting side streets or driveways may block the path crossing.
- Because of the proximity of motor vehicle traffic to opposing cycling traffic, barriers are often necessary to keep motor vehicles out of trails and cyclists out of traffic lanes. These barriers can represent an obstruction to cyclists and motorists, can complicate maintenance of the facility, and can cause other problems as well.

*Note: bikeways are listed in increasing order of complexity, with no implied order of preference.

What to do when a multi-use trail intersects with a street without sidewalks? Pay attention to the numerous facts that state that the well-intentioned but unsafe impulse to build a trail next to a street is not the correct design approach. Instead, the trail should transition to a traditional sidewalk system (even if only constructed for a short distance). This approach will be consistent with the overall non-motorized network concept, operate more safely for the user, and operate more safely for the automobile. The only exception to this rule shall be when a multi-use trail literally crosses a roadway and does not involve the construction of facilities that run parallel to the roadway.

ON-STREET FACILITY DESIGN STANDARDS
Options for Complete Streets

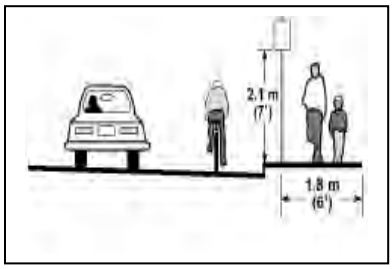
There are no specific bicycle standards for most shared local roadways; they are simply the roads as constructed. Shared roadways function well on local streets and minor collectors, and on low-volume rural roads and highways. Mile per mile, shared roadways are the most common bikeway type.

Shared roadways are suitable in urban areas on streets with low speeds - 30 MPH or less - or moderate traffic volumes (12,000 ADT or less, depending on speed and land use).

In rural areas, the suitability of a shared roadway decreases as travel speeds and volumes increase, especially on roads with poor sight distance. Where bicycle use or demand is potentially high, roads should be widened to include shoulder bikeways where the travel speeds and volumes are high.

Many urban local streets carry excessive traffic volumes at speeds higher than they were designed to carry. These can function as shared roadways if traffic speeds and volumes are reduced. There are many "traffic calming" techniques that can make these streets more amenable to bicycling on the road.

Wide Curb Lanes

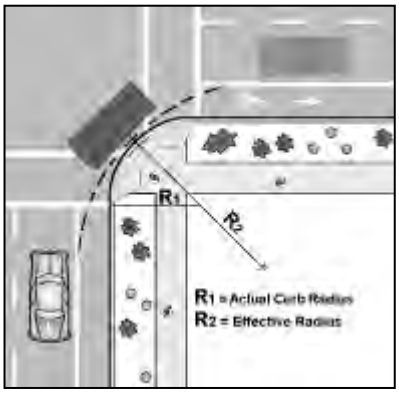


A wide curb lane (bike friendly lanes) may be provided where there is inadequate width to provide the required bike lanes or shoulder bikeways. This may occur on retrofit projects where there are severe physical constraints, and all other options have been pursued, such as removing parking or narrowing travel lanes. Wide curb lanes are not particularly attractive to most cyclists; they simply allow a motor vehicle to pass cyclists within a travel lane.

Bike Lanes

Bike lanes are advantageous in certain applications because by providing cyclists with their own space on the road, bike lanes improve access to destinations and commute options. Bike lanes on arterials:

- Establish the correct position of bicyclists on the roadway.
- Reduce bicycle/pedestrian conflicts as fewer cyclists ride on sidewalks.
- Provide bicyclists a space to travel at their own speed next to motorists.
- Increase the effective turning radius for right turns at



intersections.

- Guide bicyclists through intersections.
- Provide additional pedestrian buffer from adjacent automobile traffic.
- Allow bicyclists to pass motor vehicles backed up at intersections (a bike lane is a legal travel lane); and
- Send a message to motorists that bicyclists have a right to the roadway.

Shoulder Bikeways

Paved shoulders are provided on rural highways for a variety of safety, operational and maintenance reasons:

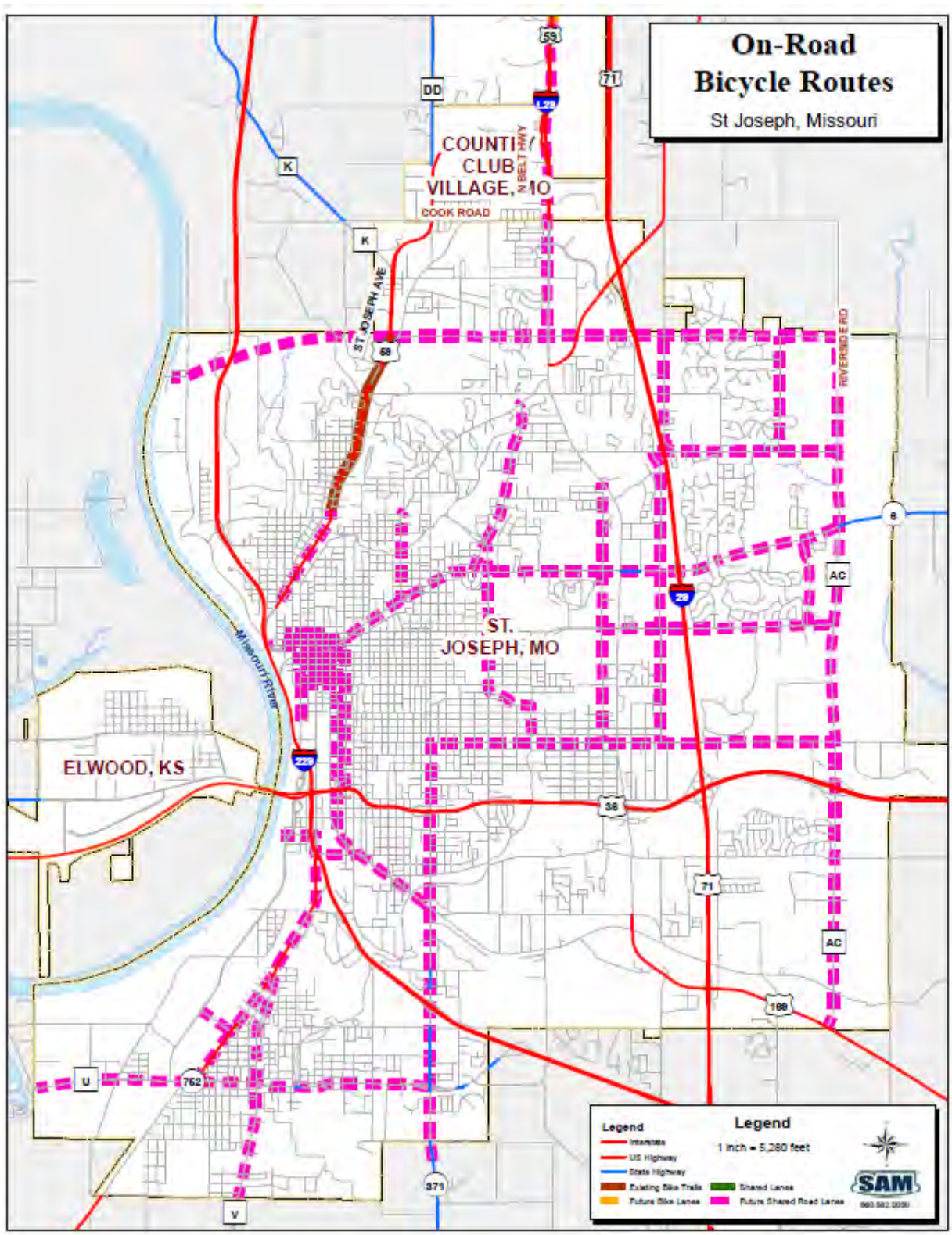
- Space is provided for motorists to stop out of traffic in case of mechanical difficulty, a flat tire or other emergency;
- Space is provided to escape potential crashes;
- Sight distance is improved in cut sections;
- Highway capacity is improved;
- Space is provided for maintenance operations such as snow removal and storage;
- Lateral clearance is provided for signs and guardrail;
- Storm water can be discharged farther from the pavement; and
- Structural support is given to the pavement.

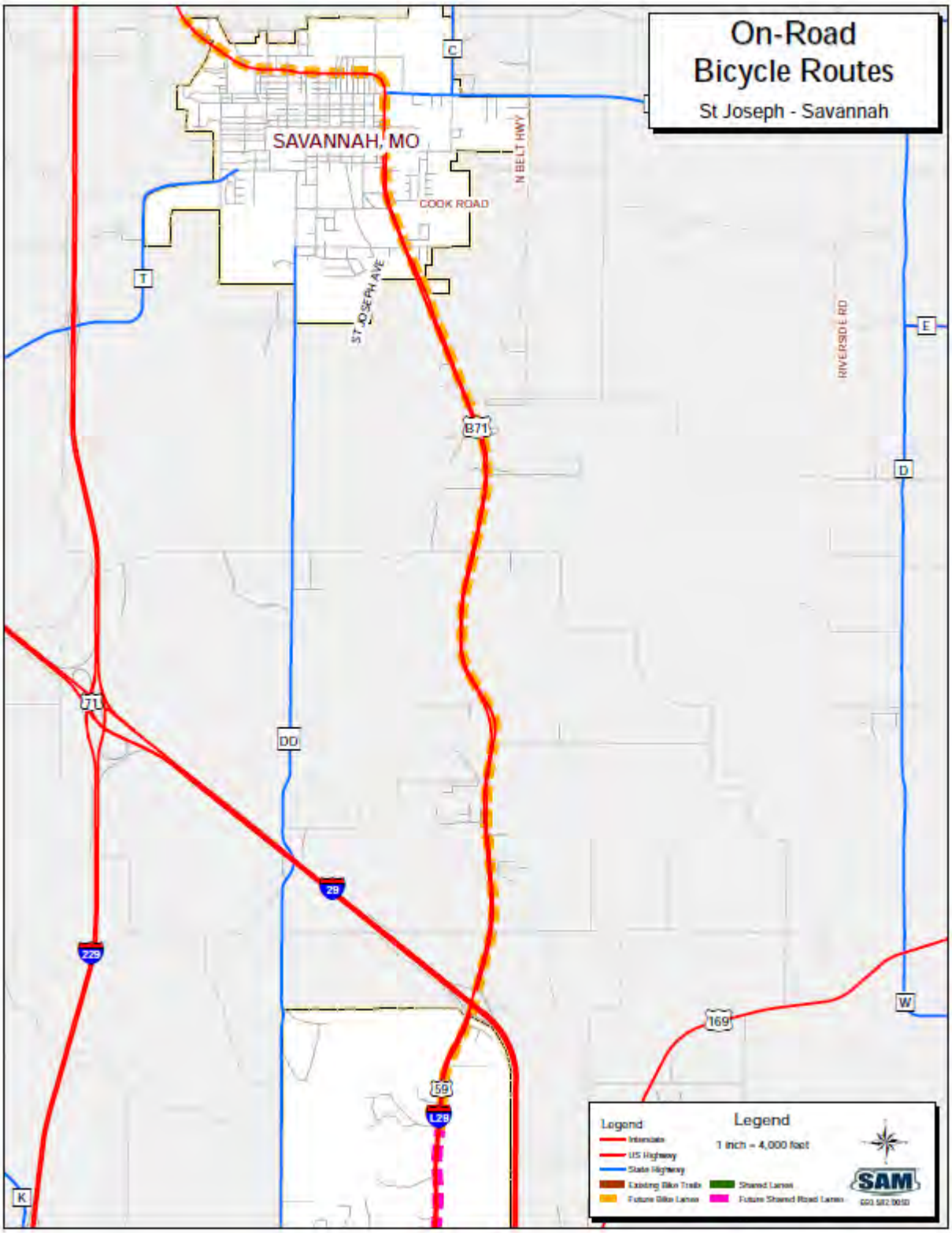
Width Standards

In general, the shoulder widths recommended for rural highways in the MoDot Highway Design Guide serve bicyclists well, when constructed. The following table should be used when determining roadway shoulder widths:

	ADT under 250	ADT 250-400	ADT 400-DHV* 100	DHV 100-200	DHV 200-400	DHV over 400
Rural Arterials	1.2 m (4 ft)	1.2 m (4 ft)	1.8 m (6 ft)	1.8 m (6 ft)	2.4 m (8 ft)	2.4 m (8 ft)
Rural Collectors	0.6 m (2 ft)	0.6 m (2 ft)	1.2 m (4 ft)	1.8 m (6 ft)	2.4 m (8 ft)	2.4 m (8 ft)
Rural Local Route	0.6 m (2 ft)	0.6 m (2 ft)	1.2 m (4 ft)	1.8 m (6 ft)	1.8 m (6 ft	2.4 m (8 ft)

*DHV (Design Hour Volume) is the expected traffic volume in the peak design hour (usually at commuter times); usually about 10% of ADT in urban areas, higher on rural highways with high recreational use.


On-Road
Bicycle Routes
St Joseph, Missouri
COUNTRY CLUB VILLAGE, MO
COOK ROAD
ST. JOSEPH, MO
ELWOOD, KS
ST JOSEPH AVE
N BELT HWY
RIVERSIDE RD
MISSOURI RIVER
Legend
Interstate
US Highway
State Highway
Existing Bike Trails
Future Bike Lanes
Shared Lanes
Future Shared Road Lanes
Legend
1 inch = 5,280 feet
SAM


On-Road
Bicycle Routes
St Joseph - Savannah
SAVANNAH, MO
COOK ROAD
N BELT HWY
ST JOSEPH AVE
RIVERSIDE RD
C
T
E
D
W
K
DD
B71
71
29
229
169
59
L29
Legend
Legend
1 inch = 4,000 feet
Interstate
US Highway
State Highway
Existing Bike Trails
Shared Lanes
Future Bike Lanes
Future Shared Road Lanes
SAM

SIDEWALKS
Widths, Uses & Standards

Sidewalks are a very important component of the pedestrian network and of the roadway itself. As the public way is constructed and maintained to provide safe and efficient circulation for automobiles and bicycles, so too should the needs of the pedestrian be included.

To quote from AASHTO, 2018:

> *Utilizing or providing a sidewalk as a shared use path is unsatisfactory for a variety of reasons. Sidewalks are typically designed for pedestrian speeds and maneuverability and are not safe for higher speed bicycle use. Conflicts are common between pedestrians traveling at low speeds (exiting stores, parked cars, etc.) and bicyclists, as are conflicts with fixed objects (e.g., parking meters, utility poles, sign posts, bus benches, trees, fire hydrants, mail boxes, etc.) Walkers, joggers, skateboarders, and roller skaters can, and often do change their speed and direction almost instantaneously, leaving bicyclists insufficient reaction time to avoid collisions.*

Sidewalks, then, are provided to serve pedestrians. This might range from the resident walking from home to a neighbor's house, to a child walking to a friend's house a few blocks away. Individuals may walk, jog, or skate to reach their destination, but this is the type of use intended to operate on the facility. Users groups may further be subcategorized to include the same elements for persons with disabilities. Design efforts should focus upon these collective uses and the requirements necessary to support the same.

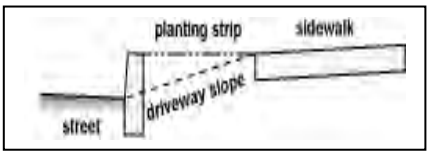
Width

The width of sidewalks not only affects pedestrian usability, it also determines the types of access and other pedestrian elements that can be installed. For example, a 60-inch sidewalk is wide enough to accommodate pedestrian traffic in a residential area, but a much wider sidewalk would be necessary to include amenities such as street furniture or newspaper stands in a retail area.

Design width is defined as the width specification the sidewalk was intended to meet; it extends from the curb or planting strip to any buildings or landscaping that form the opposite borders of the sidewalk. Minimum clearance width is defined as the narrowest point on a sidewalk. An inaccessible minimum clearance width is created when obstacles such as utility poles protrude into the sidewalk and reduce the design width. A reduction in the design width could also create a minimum clearance width challenge.

Although most guidelines require sidewalk design widths to be at least 60 inches wide, larger design widths can accommodate more pedestrians and improve ease of access. The AASHTO

Green Book, the Oregon Department of Transportation, the Institute of Transportation Engineers, and other guidelines recommend wider design widths in areas with high volumes of pedestrians. The sidewalk width often depends on the type of street and the adjacent landuse. In general, residential streets have narrower sidewalks than commercial streets.



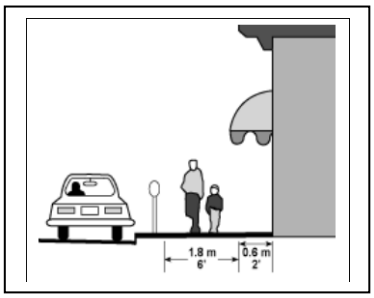
Sidewalks shall lie in a continuous plane with a minimum of surface warping. Nonplanar surfaces are frequently found at driveway crossing flares and curb ramps without landings. Rapidly changing cross-slopes can cause one leg of a walker to lose contact with the ground, or cause walking pedestrians to stumble or fall. AASHTO sets the maximum cross-slopes at not to exceed 1.5%, but current ADA guidance sets the maximum at 2%. To meet ADA, a maximum of 2% is the recommended cross-slope for sidewalks, although the AASHTO standard would be more desirable, if possible.

The width of the sidewalk is also affected by pedestrian travel tendencies. Pedestrians tend to travel in the center of sidewalks to separate themselves from the rush of traffic and avoid street furniture, vertical obstructions, and other pedestrians entering and exiting buildings. Pedestrians avoid the edge of the sidewalk close to the street because it often contains utility poles, bus shelters, parking meters, sign poles, and other street furniture.

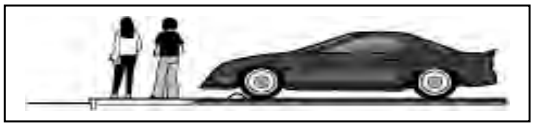
Pedestrians also avoid traveling in the 0.610 (24 inches) of the sidewalks close to buildings to avoid retaining walls, street furniture, and fences. The sidewalk area that pedestrians tend to avoid is referred to as the **shy distance,** a term that is applied to both cyclist and pedestrian tendency to shy away from perceived obstacles or "threats". Considering the shy distance, only the center six feet of a ten-foot sidewalk is used by pedestrians for travel. Thus, the effective width of a sidewalk, not the design width, constitutes the sidewalk area needed to accommodate anticipated levels of pedestrian traffic.

In general, the same notion that is used to categorize the hierarchy of streets and roadways can be applied to sidewalks. Functional classification systems reflect that certain types of streets operate differently and serve different purposes. Factors that impact functional class for automobiles would include land use, destinations, linkages, volume of traffic, and vehicle type. Sidewalks should use the same approach except that the design treatment should be included in the analysis of accommodating all three classes of cyclists and all four classes of pedestrians, and would examine traffic volumes in a dual fashion: automobile speed and volume on the adjacent roadway and expected/anticipated type and volume of facility traffic. The concept is that higher volume bicycle/pedestrian facilities would mimic the roadways they border because travel characteristics tend to be similar in nature and route chosen.

For general guidance, most residential areas require a minimum five foot wide sidewalk, with a wide planter strip (wide enough to make it feasible to plant trees and maintain grass without planting trees too close to both sidewalk and street in a narrow strip). In certain residential areas, where sidewalks link trails, link schools, or connect to nearby high destination areas such as a movie theater, wider sidewalks are required with a minimum of 6 feet and a maximum of 8 feet.



Commercial areas shall include a minimum of an 8-foot walk with a maximum to be determined by examining the adjacent roadway characteristics and anticipated sidewalk treatments (benches, newspaper stands, soda machines, etc.) that a business may propose. Given that most commercial interests seek a high volume of customers, it is reasonable to assume that sidewalks serving such locations will serve a greater number of users and should be designed to do so. Providing a scant three foot wider section of pavement than would be provided in a residential area is not consistent with the design principles provided in this document and the referenced design guidelines; however, given that commercial endeavors range from retail, to professional services, to wholesale, to a combination of uses in-between, flexibility is here provided by setting only a minimum width and allowing the designer the opportunity to propose the appropriate treatment for the particular application of these guidelines.



Dependent upon the commercial development type, and its proposed parking uses adjacent to a sidewalk, it is important to recognize that instances such as the automobile overhang seriously impair the capacity and safety of the facility. In such instances, wider walks will be required to preserve the functional capacity and safety of the design element.

Not withstanding the preceding information, sidewalks shall generally conform to the following approach in an urban environment as minimum widths:

- Sidewalks along Local Streets – 5’
- Sidewalks along Collector Streets – 5’
- Sidewalks along Arterial Streets – 5’

ADA

Passing space is defined as a section of sidewalk wide enough to allow two users to pass one another or travel abreast. The passing space provided should also be designed to allow one wheelchair user to turn in a complete circle.

The issue of passing space or usable space is really not limited to ADA, but to functionality. Hearkening to a favorite saying by Dan Burden, “4-foot walks are for lovers”. In this comment, Mr. Burden points to the fact that two normal adults find it difficult to comfortably walk next to each other on a four-foot walk. One of the pedestrians is forced to walk off the sidewalk or place his arm around the companion for a closeness that will allow room on the pavement to walk. A wider surface would not only make the walk more disability friendly but would make the facility more inviting to and usable by the remaining population.

Passing space interval is the distance between passing spaces when/where a sidewalk width is too narrow for a prolonged distance because of a narrow design width or continuous obstacles. Section 4.3.4 of ADAAG states, “accessible routes with less than 60 inches of clear width must

provide passing spaces at least 60 inches wide at reasonable intervals not exceeding 200 feet. If turning or maneuvering is necessary, a turning space of 60 inches x 60 inches should be provided", ADAAG, 1991.

In jurisdictions where narrow sidewalks are condoned, additional attention will have to be given to the turnarounds. Typical driveway sections will have to be altered such that the cross-slopes and vertical clearances fall within ADA guidelines for use as turning spaces. Walks that are constructed to a width of 60 inches or greater would not require the inclusion of turning spaces, as the entire design width would be adequate to comply with the needs of persons with disabilities.

Per AASHTO and other design guides, it is important to note that the closer in proximity a sidewalk is to the driving lanes of the automobile, the narrower the clearance width becomes. Thus, sidewalks that are constructed at the edge of the street curb are required to be wider than the same sidewalk, in the same neighborhood, on the same street - with a planter strip – to maintain a safe and adequate clearance width. What saves one funds in bricks and mortar will cost one more in developable space and vice versa.

SIDEWALK FURNITURE
Private Use, the ADA, & Obstacles in Downtowns

Sidewalks are a public space. In downtowns and other commercial/retail areas, rich traditions exist of utilizing public sidewalks as a component or extension of the business. Many areas allow the use of sidewalks for the display of products, others provide for the installation of fenced areas for outside dining, and yet others allow sidewalk vendors use of sidewalks for food, snacks, and general product sales. The positives of such uses are that businesses are able to use sidewalks as an extension of retail use, creating a sense that there is activity in a block. It also increases retail visibility.

On the other side are the challenges in allowing such uses while complying with the ADA and preserving general public access. This particular subject is a consistent point of confusion as it requires a combination of ADA and other design standards to understand how to preserve the use of the sidewalk.

The ADAAG states that a sidewalk may be narrowed to 36" to clear an obstruction but another citation sets forth the minimum sidewalk width as 4' with requirements for 60" turn-a-rounds every 200' or less.

The ADAAG and AASHTO stress recognition of shy distance being 24" from features such as a building wall and the concept of passing space. ADAAG and AASHTO also stress that sidewalk width should vary depending upon adjacent land use. In combination, the "apparent" ADA sidewalk narrowing width to 36" is, in fact, not accurate when considering the other measures. Here is why:

1. The 36" standard was developed to address wheelchair access through and to interior spaces. Typically, such spaces (doorways and hallways) only have one person passing through the space at a time. Thus, the standard is only sufficient to address one-way access or traffic for interior spaces.
2. On a public sidewalk (using the example of a retail center), one is required to consider the higher volume of two-direction traffic. Thus, if a sidewalk were narrowed to 36", another wheelchair or pedestrian would be forced into the street at the point of the obstruction. This would not create an ADA issue, but would create a serious safety issue. Conversely, if the obstruction space were being passed by a pedestrian, wheelchair users would not be able to pass or would be forced into the street: an ADA issue.
3. If one ignored two-way travel, consider then the impact of the shy distance concept. That would mean that in a 36" wide space, next to a wall or fence, the inside 24" would naturally be uncomfortable for pedestrians or a wheelchair user to operate in. Now, place the access between a curb and a fence and factor in the shy distance. This would mean that a wheelchair (and pedestrians in general) would naturally walk at least 24" from the curb, leaving then only 12" to comfortably operate in. With a 6-9" drop-off at a curb, providing a 36" access width would not serve as a comfortable or safe sidewalk facility.
4. In an area where on-street parking is allowed adjacent to the public sidewalks, it is possible that some space will be lost to overhanging bumpers or opening car doors. The concept of *clear space* or *clear width* accounts for such occurrences. The clear width standard provides

a buffer between the sidewalk and a vehicle travel lane to address the possible instances where the driver loses control and veers toward a sidewalk as well. This buffer allows some time for a pedestrian to react as well as some additional time/space for the driver to regain control. All standards agree that a pedestrian, whether ADA or not, should never be restricted to a tight space with direct exposure to a motor vehicle. Being caught between a vehicle and a large wall, without space to maneuver, is not a predicament any pedestrian would relish or feel comfortable walking in.

Given these concerns, then what is the minimum, practical ADA width on sidewalks, when encountering placed or constructed obstructions like street furniture, product displays, tables, or fencing? If one starts with the basic 36" width assumption, one then adds the 24" for shy distance, equaling 5'. This still ignores the concern relative to the clear width, but if one factored this measure and ignored the shy distance, the result would again be 5'. This is the minimum width for sidewalk obstructions when addressing an obstacle wider than 6" (like a half-block of fencing or tables in front of an entire business).

For single-point obstacles (using the interior space concept for doorway access employed by the ADA), items like a signpost, fire hydrant, or flowerpot would result in a basic calculation starting with 36" for single direction access. Normally, obstacles like a signpost or fire hydrant are already spaced 1-2' from the back of curb so the clear width standard would not be considered. However, shy distance would apply and the fact that public sidewalks function to serve pedestrians in two directions would apply, both requiring a greater sidewalk width.

The mitigating factor to consider is that the narrowing in this definition is 6" or less wide (like passing through a door), meaning that possible conflicts in two-directional traffic would be minor and brief. One should also assume that for a very short distance a pedestrian would be comfortable with applying only half of the standard 24" for either shy distance or clearance width (whichever would be appropriate given the circumstances) before returning to a normal and safe sidewalk width. These considerations would result in adding the basic 36" width and half of the 24" measure from either the appropriate shy distance or clearance width (12") and arriving at 48" or four feet. It is with these considerations that point obstacles, no wider than 6", may narrow the sidewalk to 48" before returning to the nominal, effective width of 5' for the sidewalk.

PRACTICES TO BE AVOIDED
Knowing What Tools to Use in the Right Location

National experience in design has occurred over 20 years with accumulated experience in complete designs. This has led to improvements in the learning curve indicating positive alternatives and some practices that have proven to be poor ones.

Sidewalk Bikeways

Some early bikeways used sidewalks for both pedestrians and bicyclists. While in rare instances this type of facility may be necessary, or desirable for use by small children, in most cases it should be avoided.

Sidewalks are not suited for cycling for several reasons:

- Cyclists face conflicts with pedestrians;
- There may be conflicts with utility poles, signposts, benches, etc.;
- Bicyclists face conflicts at driveways, alleys and intersections: a cyclist on a sidewalk is generally not visible to motorists and emerges unexpectedly. This is especially true of cyclists who ride opposing adjacent motor vehicle traffic: drivers do not expect a vehicle coming from this direction; and
- Bicyclists are put into awkward situations at intersections where they cannot safely act like a vehicle but are not in the pedestrian flow either, which create confusion for other road users.

Cyclists are safer when they are allowed to function as roadway vehicle operators, rather than as pedestrians.

Where constraints do not allow full-width walkways and bikeways, solutions should be sought to accommodate both modes (e.g. narrowing travel lanes or reducing on-street parking). In some urban situations, preference may be given to accommodating pedestrians. Sidewalks should not be signed for bicycle use - the choice should be left to the users.

Extruded Curbs

These create an undesirable condition when used to separate motor vehicles from cyclists: either one may hit the curb and lose control, with the motor vehicle crossing onto the bikeway or the cyclist falling onto the roadway. At night, the curbs cast shadows on the lane, reducing the bicyclist's visibility of the surface. Extruded curbs make bikeways difficult to maintain and tend to collect debris. They are often hit by motor vehicles, causing them to break up and scatter loose pieces onto the surface.

Reflectors & Raised Pavement Markers

These can deflect a bicycle wheel, causing the cyclist to lose control. If pavement markers are needed for motorists, they should be installed on the motorist's side of the stripe, and have a beveled front edge.

Two-Way Bike Lane
This creates a dangerous condition for bicyclists. It encourages illegal riding against traffic, causing several problems:

- At intersections and driveways, wrong-way riders approach from a direction where they are not visible to motorists;
- Bicyclists closest to the motor vehicle lane have opposing motor traffic on one side and opposing bicycle traffic on the other; and
- Bicyclists are put into awkward positions when transitioning back to standard bikeways.

If constraints allow widening on only one side of the road, the centerline stripe may be shifted to allow for adequate travel lanes and bike lanes.

Continuous Right-Turn Lanes
This configuration is difficult for cyclists. Riding on the right puts them in conflict with right-turning cars but riding on the left puts them in conflict with cars merging into and out of the right-turn lane. The best solution is to eliminate the continuous right-turn lane, consolidate accesses and create well-defined intersections.

Rumble Strips
Rumble strips are provided to alert motorists that they are wandering off the travel lanes onto the shoulder. They are most common on long sections of straight freeways in rural settings but are also used on sections of two-lane undivided highways. Early designs placed bumps across the entire width of the shoulder, which is very uncomfortable for cyclists.

THE URBAN TRAIL SYSTEM
Where Trails, Sidewalks, and Shared Roadways Meet

The St. Joseph Metropolitan Area has one of the model non-motorized programs in the Midwest. It is both thorough and comprehensive in its approach. Initial phases sought to develop modal facilities along the Parkway System (a greenway) on a north-south axis, while later phases have focused upon the adaptive re-use of former railway corridors oriented on an east-west axis.

The locations of the trails themselves are consistent with national design guidance for trail deployment in that they have not been constructed in areas with prevalent conflict points involving driveways, intersections, and at-grade crossings. Although the majority of the trail is grade separated, infrequent street crossings are at-grade and most are on low volume streets.

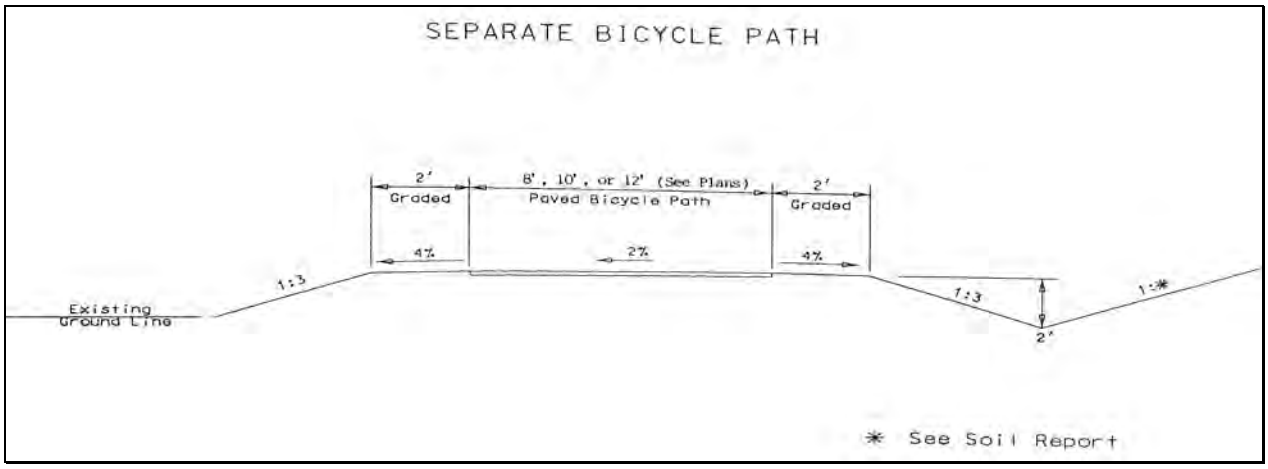
Good progress has also been made designing new streets appropriately and retrofitting streets impacted with new development or re-development.

This document will refer to the trail system (10' multi-use, bi-directional trails) and the non-motorized network (a system of integrated, 10' multi-use trails, sidewalks, and on-street facilities). In the accompanying maps the trail system is defined using the following terms:

- Urban Trail – 10' multi-use trail (System)
- Trail Connectors – traditional on-street sidewalks and shared bike lanes (Network)
- Parkway – include possible bike lanes, sidewalks, or shared lanes (Network)

BICYCLE TRAIL/PATH

The typical AASHTO section for a trail is as illustrated below. The facility type would only be applied in green spaces (along or near a parkway system), former railroad right-of-way corridors, and other isolated applications.



Rare exceptions would include only the construction of a trail on one side of a street that was heavily developed, where topographic challenges existed, or where right-of-way availability was severely limited. It is not recommended that a trail section ever replace a traditional sidewalk as

a component of new roadway construction, widening, retrofitting, or related improvements. The criteria under which exceptions or variances are available in this instance should be even more stringently applied before allowing "trail" use in areas other than those described in the preceding paragraph, per the guidance provided earlier in this document. Even in such an isolated case, the safety problems caused by such a deployment are significant and should be strongly discouraged, as the benefits may not outweigh the negatives.

There is certainly no operational conflict between the linkage of a trail system to a more traditional sidewalk and shared roadway facilities, as long as appropriate signage is deployed to inform the user of the transition. In fact, trail systems are ideally used to link traditional systems to one another, if the extension of traditional facilities is not possible.

The MPO has also identified that various surface types are necessary and appropriate for the various phases of the urban trail system. In more lightly populated areas and in areas linking the urban system to a rural and regional trail network, a crushed aggregate surface may be appropriate. In more densely populated, higher use sections of the trail it is recommended that either concrete or asphalt pavements be utilized.

However, because of the safety and operational hazards resultant from constructing trails in areas other than greenways, facilities appropriate to and for the adjacent land use have to be accommodated. In such a case, a trail would represent a link between different systems (the network), not a replacement for the same.

From a systematic approach, a "link" is a part of the overall network of facilities designed to provide citizens an option of riding one's bike, walking, or driving the automobile. In certain areas that are appropriate for trail or shared path construction, a typical trail section should be constructed that is continuous throughout. It may connect to systems that are more traditional, i.e. streets with sidewalks on both sides, streets with wide lanes, and streets with bike lanes; allowing all users the ability to walk from a home or business to access the facility in front of their location and travel to the closest trail connection, or vise versa. Neighborhoods that lie along the Parkway or former Chicago and Rock Island Railroad are good examples of this concept; making trails an integral part of the whole, but not a replacement for poor planning.

Future Trail Sections

The St. Joseph area has made significant inroads in planning, designing, and constructing components of its trail system. Over the years since the vision of greenway development was introduced, many phases of the trail have been designed by the City of St. Joseph and more are contemplated by Country Club Village, Savannah, Elwood, and Wathena as well. However, many components of the main north/south axis remain, as well as decisions about where to continue on an east/west basis. The categories of trails can be listed as follows:

- Trails within existing greenways
    - Within the St. Joseph Parkway System
    - Conservation areas, such as the Missouri River levee system, or within state parks that must connect to the network
    - Drainage areas (Conservation trails), including the various rivers, creeks, and streams within the area over which most communities already maintain

easements. Good examples exist in this category in St. Louis, Kansas City, and Springfield. This is often the most expensive and most challenging option to explore, but also provides great benefits in accessing properties at a neighborhood scale. In the St. Joseph area, natural areas along the 102 River, Whitehead Creek and their respective sub-basins hold promise.

- Rails to Trails – include both the re-acquisition and retention of railroad corridors. The category has proven itself on a national basis and operates as one of the safest, cheapest (mile for mile), and most popular environments for trails. With the majority of rail corridors being entirely grade separated, few conflicts between the system users and automobiles occur.
- Utility Corridors – examples would include electric utilities and underground pipeline company easements that crisscross the region. It is common in some regions that utilities will allow the use of their easements for trails. It is a positive for them in that a second jurisdiction will in turn be responsible for vegetation maintenance and also offers an opportunity for supporting public uses that many corporations strive for. Such uses also enhance utility access for system maintenance.

Rails to Trails:

For St. Joseph-

- Chicago & Great Western Corridor – Maple Leaf Parkway to Northside Complex/Northwest Parkway Trail: It provides linkages to neighborhoods along St. Joseph Avenue to connections with the trail itself and recreational facilities near Krug Park. The grade is generally flat and even, with few obstructions. The St. Joseph Parks Department already maintains a significant portion of the same as it lies near the parkway system and enhances it as additional greenway space. It was included as a design element in the recently completed Blacksnake Creek project in 2019.

- Chicago & Great Western Corridor – Northside Complex to County Line Road: This segment would be a continuation of the previous segment. Right of way is a greater challenge because the corridor was abandoned and property would have to be obtained from property owners. It is attractive because it would link neighborhoods to the north that are functionally disconnected from the non-motorized network and provides an important connection to Country Club Village, St. Joseph, rural portions of Andrew County, and Savannah. Ultimately, the overall corridor is critical to establish a northern connection to the Quad States Trail and the Great American Rail Trail.

- Riverfront: Riverfront access opens up large sections of the Missouri River viewshed for public use is reason enough for development of a trail section through this general alignment. Further extensions north (making connection with future developments and the Cook Road extension) and south of the existing area make connections to large residential and employment centers. The large majority of this should focus upon coordinated use of the federal levee system as well, opening up the potential for establishing access toward Atchison, Weston and Platte County, consistent with the Quad States Trail concept.

- U.S. 59 Highway – City limits to Rt. 45 & Amelia Earhart Bridge over the Missouri River: This segment falls largely outside the metropolitan area, but warrants strategic inclusion because of plans moving forward in Platte County and Atchison, Kansas, and their possible connection to planning initiatives proposed and underway in the St. Joseph MPO. Options exist to coordinate through the St. Michael's Meadow arm of the Quad State Trail Organization to use the levee system, re-acquire abandoned rail corridors or utilize the Rock Island line South toward Kansas City.

  Technically, this specific corridor should probably not be listed in the "trail" category, as many of the connections could be easily designed and included as a component of the roadway typical section. However, Buchanan County may want to consider construction of a traditional trail along the abandoned railroad right-of-way that is located parallel to U.S. 59, from Route 45 to the north (former Santa Fe line). Ideally, this would connect Sugar Lake to possible improvements along Route 45, as well as on-road facilities constructed on a new section of U.S. 59 west from Route 45 to Atchison. Because of the combination of facility types, this component is being discussed in this section of the document but will likewise be illustrated as a combination of possible facilities. Such a combination would represent the ideal mix of trails functioning in a supportive way to adjacent facilities. The surface of a possible trail system section in this area would be a crushed rock aggregate. As to whether it would be considered a component of the trail system or the non-motorized network will be dependant upon decisions made later concerning the provision of on-road facilities or rails to trails options.

Country Club Village & Savannah-

- Chicago and Great Western Corridor – County Line Road to Savannah: This segment would represent a series of phases in Andrew County that would begin Country Club Village's system and extend to Savannah. As the route itself is principally rural in nature, it is recommended that this corridor be initially developed to a standard similar to that of the Katy Trail. The Katy Trail utilizes an aggregate surface that is suitable for walking in localized areas but recognizes that the intensity of use is less than that of similar trails within urban areas. With less intense use, and a corresponding focus upon bicycles for longer distances, an aggregate surface would be appropriate.

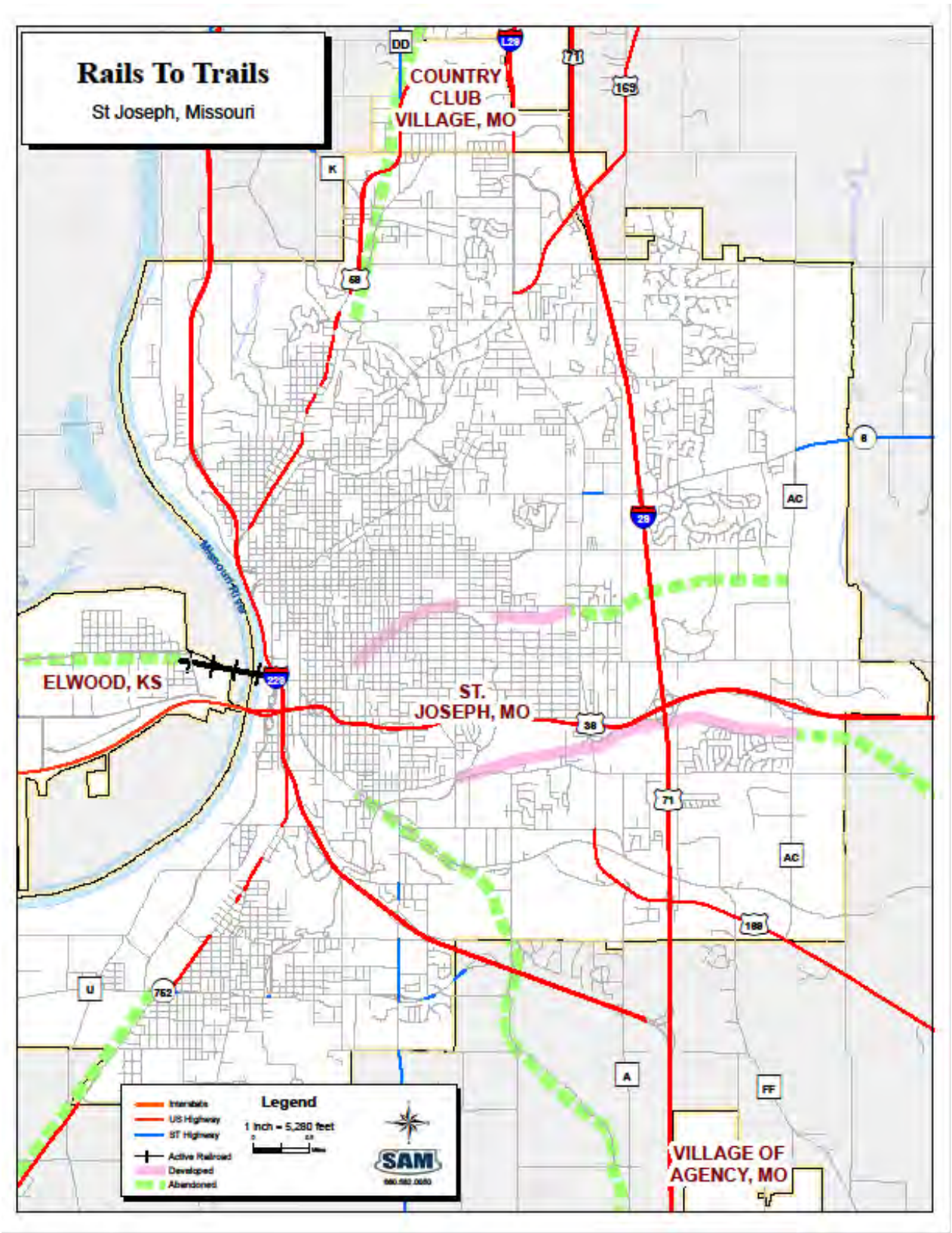
  As land-use along the trail transitions from rural to more urban uses, existing segments of the trail should be upgraded to a more permanent surface such as asphalt or concrete. However, constructing an urban section at this time, through the entirety of this area, would not be a prudent expenditure of funds.

Elwood & Wathena-

- Union Pacific Corridor – Elwood to Wathena: This section of railroad right-of-way was abandoned in 2006 and is largely intact. U.S. 36 Highway itself is currently an attractive route for many cross-state races and bike rides, so the potential use of a rail trail in this area is more certain than any other area of the metropolitan area.

The topography and aesthetics of Doniphan County as a whole represent a draw for the bicyclist alone and if teamed with a safe, off-road facility, this opportunity will represent a legitimate economic development engine for the region. Although outside the MPO, this trail should be extended further West to Maryville to join with a link on Nebraska's Cowboy Trail. These extensions and connections would provide some of the longest rail trail conversions in the nation, making the St. Joseph region the center of a biking mecca.

Unfortunately, approximately twenty bridges along the greater corridor from Elwood to Hiawatha have been removed so the cost of developing a trail system through this region may be considerable. It is recommended that the initial step of preserving the corridor be made as quickly as possible, with initial phases of work focusing upon community connections, such as between Elwood and Wathena. An initial goal of converting 5 miles was set by the Doniphan County Economic Development Commission in its development plan adopted in early 2010. No action has been taken at this time.


Rails To Trails
St Joseph, Missouri
COUNTRY CLUB VILLAGE, MO
ELWOOD, KS
ST. JOSEPH, MO
VILLAGE OF AGENCY, MO
Missouri River
Legend
Interstate
US Highway
ST Highway
Active Railroad
Developed
Abandoned
1 inch = 5,280 feet
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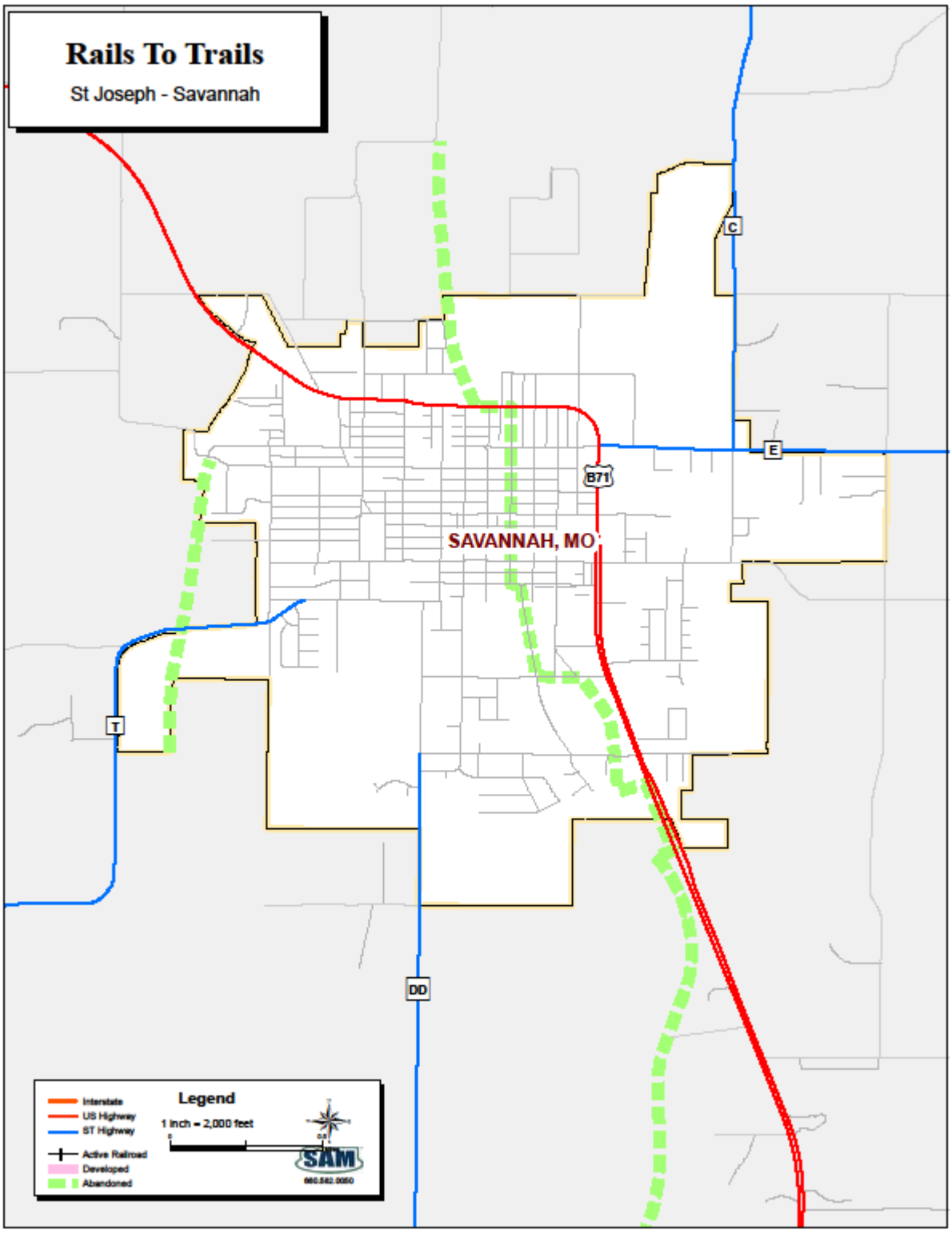
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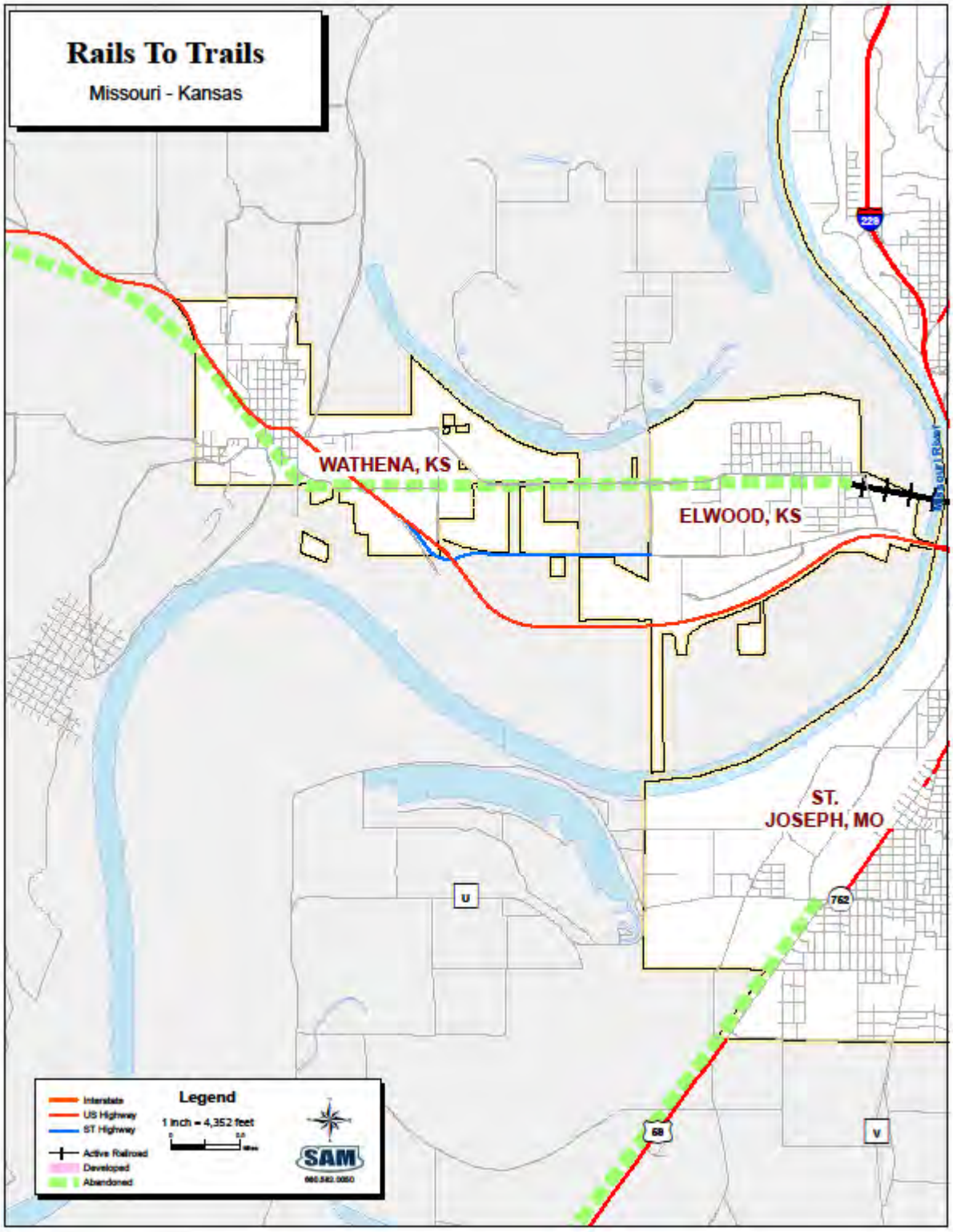
Rails To Trails
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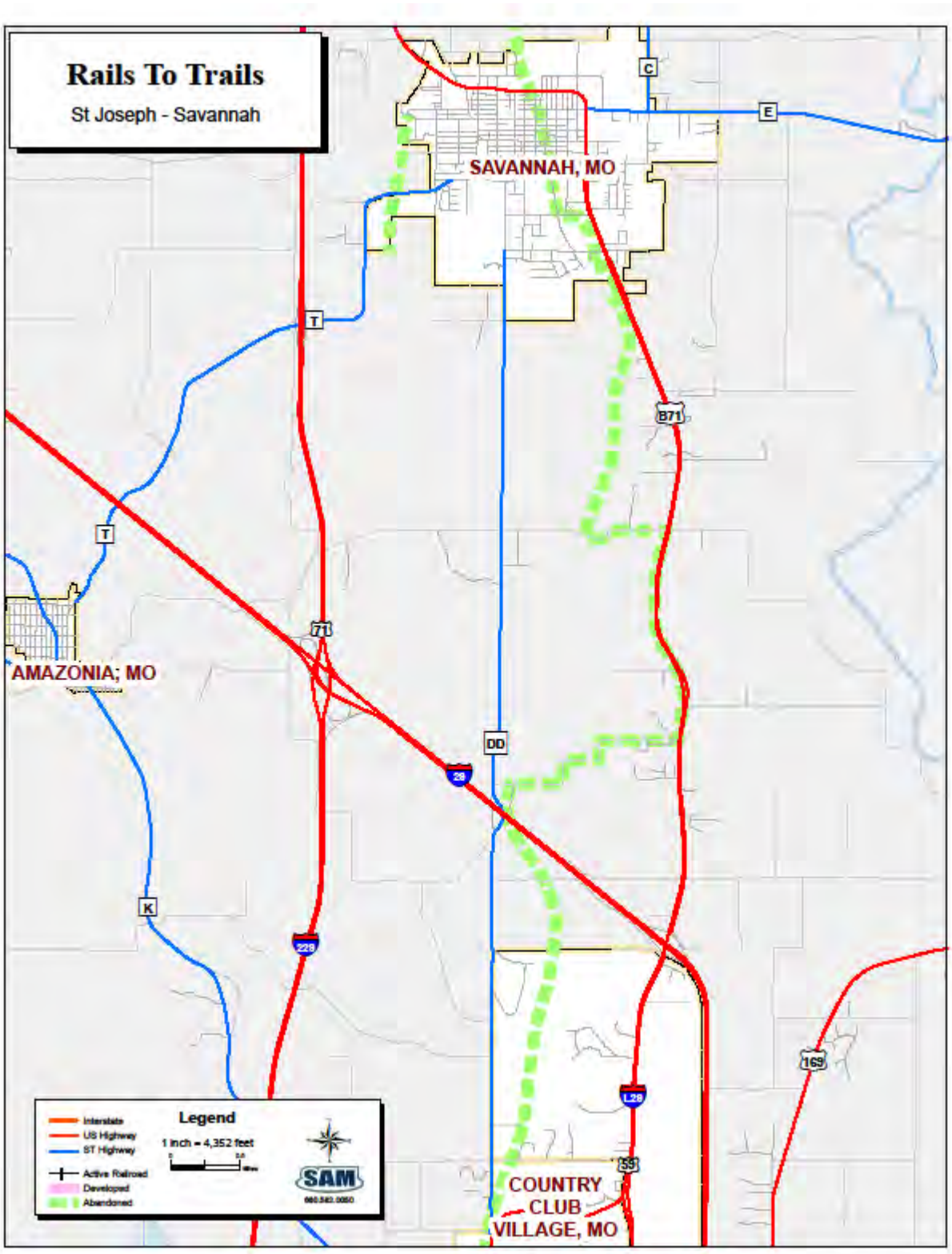
Rails To Trails
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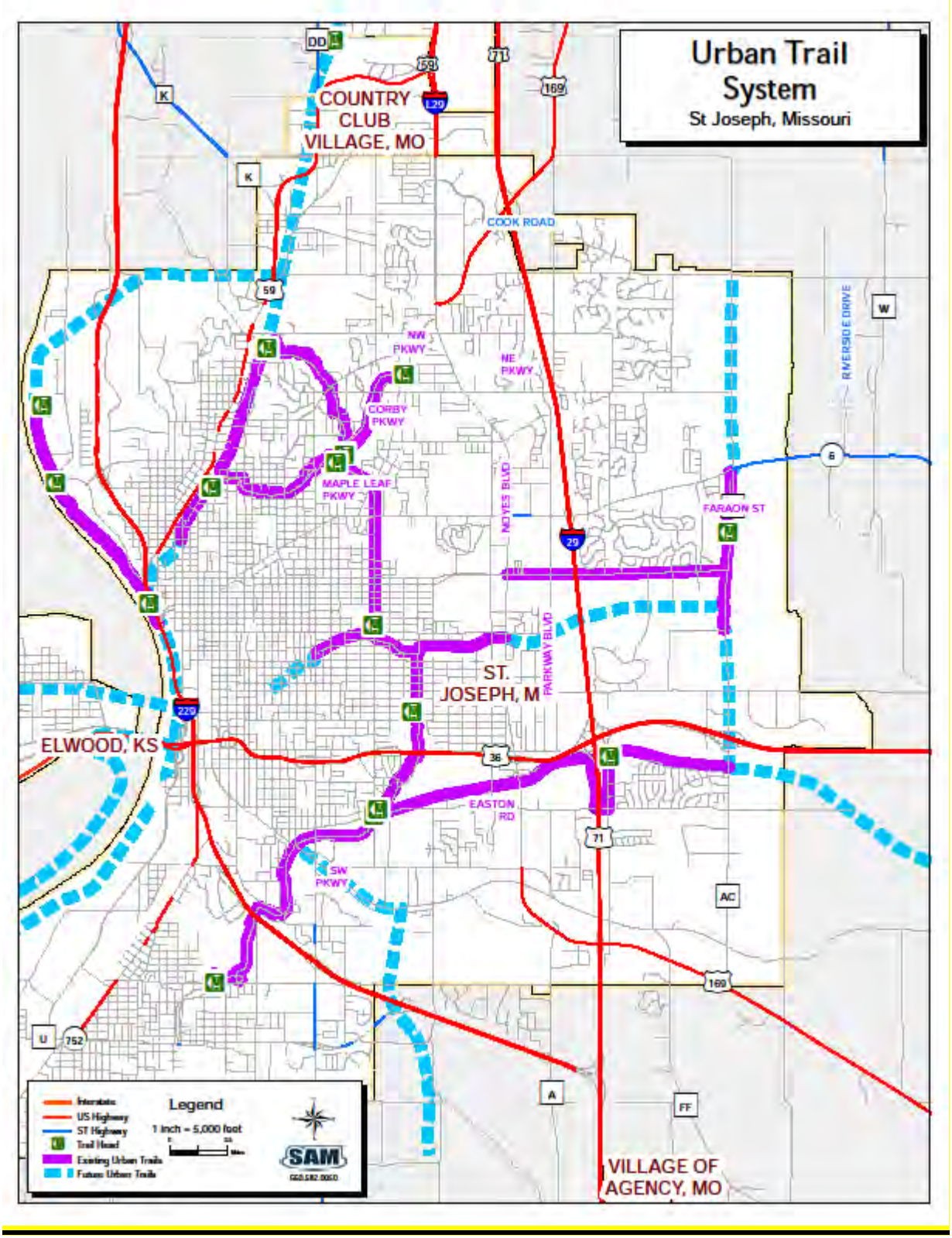
Urban Trail System
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NE PKWY
CORBY PKWY
MAPLE LEAF PKWY
NOYES BLVD
RIVERSIDE DRIVE
FARAON ST
PARKWAY BLVD
ST. JOSEPH, M
ELWOOD, KS
EASTON RD
SW PKWY
VILLAGE OF AGENCY, MO
Legend
Interstate
US Highway
ST Highway
Trail Head
Existing Urban Trails
Future Urban Trails
1 inch = 5,000 feet
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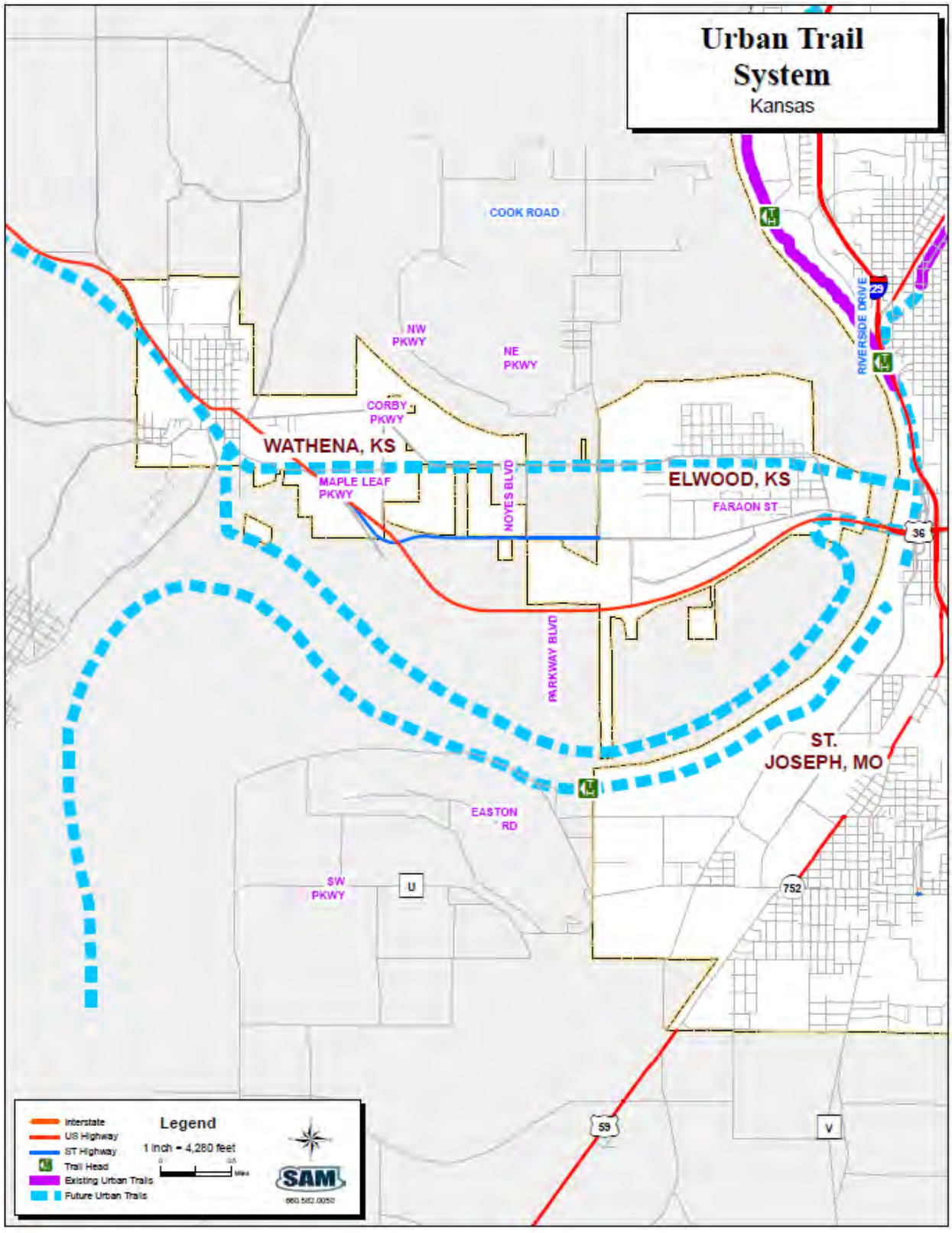
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FARAON ST
RIVERSIDE DRIVE
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PARKWAY BLVD
ST. JOSEPH, MO
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ST Highway
Trail Head
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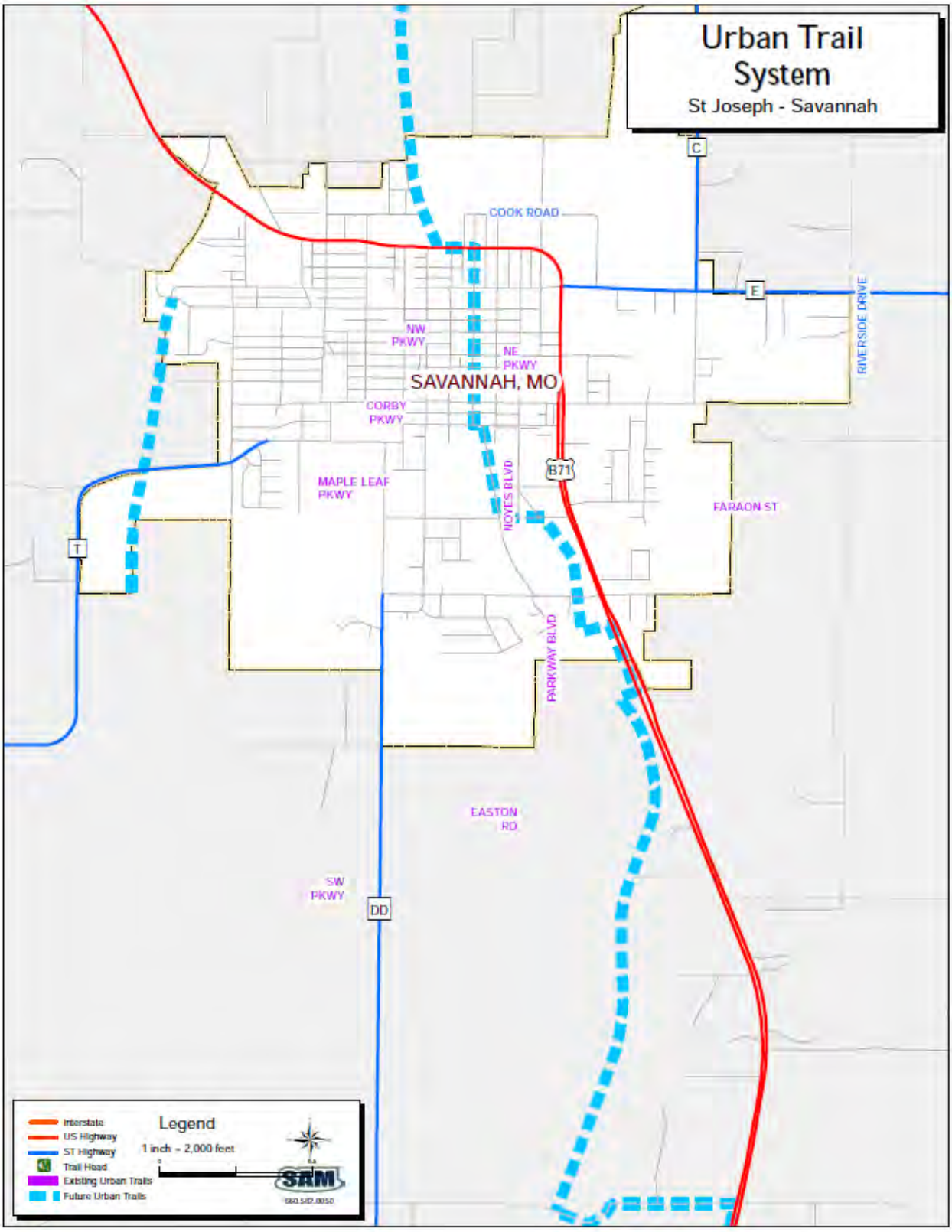
1 inch = 4,280 feet
SAM


Urban Trail System
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Interstate
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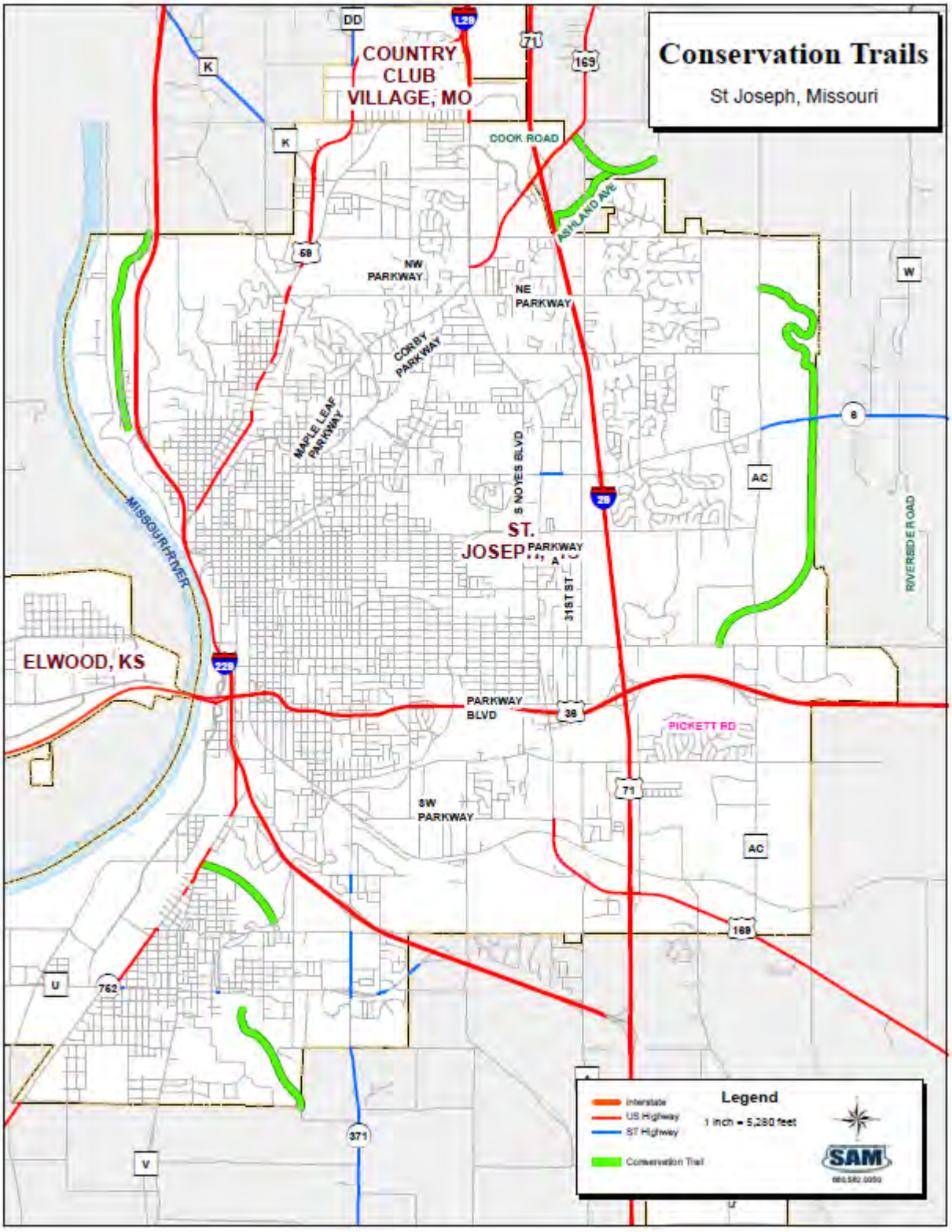

Conservation Trails
St Joseph, Missouri
COUNTRY CLUB VILLAGE, MO
ST. JOSEPH
ELWOOD, KS
MISSOURI RIVER
COOK ROAD
ASHLAND AVE
NW PARKWAY
NE PARKWAY
CORBY PARKWAY
MAPLE LEAF PARKWAY
S NOYES BLVD
31ST ST
PARKWAY BLVD
PICKETT RD
SW PARKWAY
RIVERSIDE ROAD
Legend
Interstate
US Highway
ST Highway
Conservation Trail
1 inch = 5,280 feet
SAM

RURAL TRAIL CONNECTORS
The Urban to Rural Connection

As much as an MPO may plan for inter-city and intra-city greenway trail connections within its boundaries, the rural areas surrounding a metropolitan area also hold great promise for connections to other trail systems and other metropolitan area networks.

The MPO has chosen to coordinate with an organization whose stated purpose is exactly that: encourage, promote, and assist communities with constructing trail systems that will connect between communities and states; most importantly, also connect to large and existing systems including the Wabash Trace in Iowa, the Cowboy Trail in Nebraska, and the Katy Trail in Missouri.

A local group involving residents, organizations, and businesses from the St. Joseph metropolitan area, Platte City, Leavenworth, Weston, Atchison and surrounding communities has formed the Quad State Trail Organization.

In 2019 the National Rails to Trails Association also announced its intention to partner with local, state, and federal officials to complete the first national trail route, called the Great American Rail Trail. Once again, the Quad States Trail represents the critical piece within the four-state region to connect to the national trail that routes through Nebraska and Iowa.

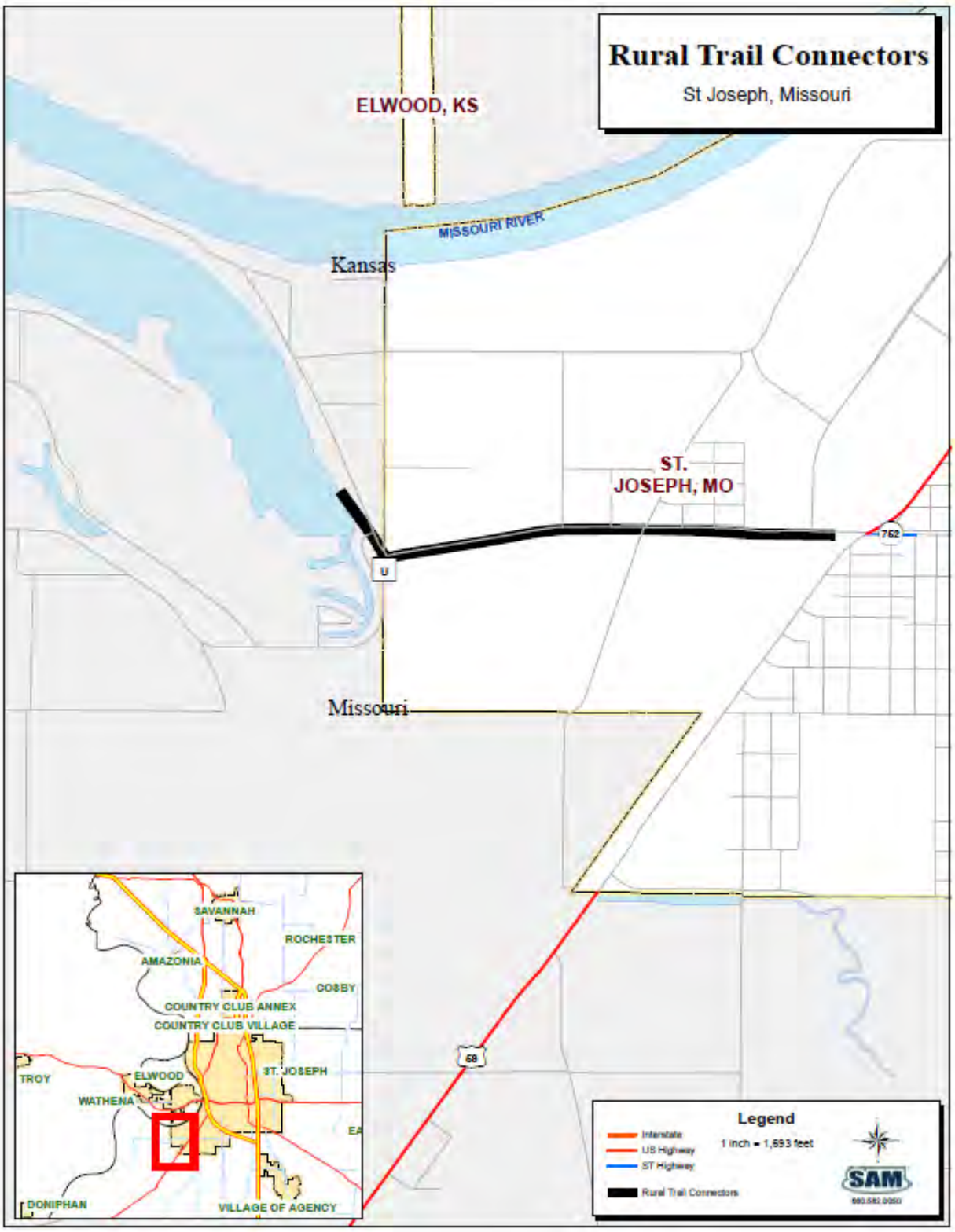
The role of the MPO, specifically, will be promote and support the preservation of trail corridors that will connect to the rural systems being developed. At the project level, requiring project sponsors to preserve grade separated crossings or to include new crossings at the time of construction will be of great concern and of great value to the overall effort.

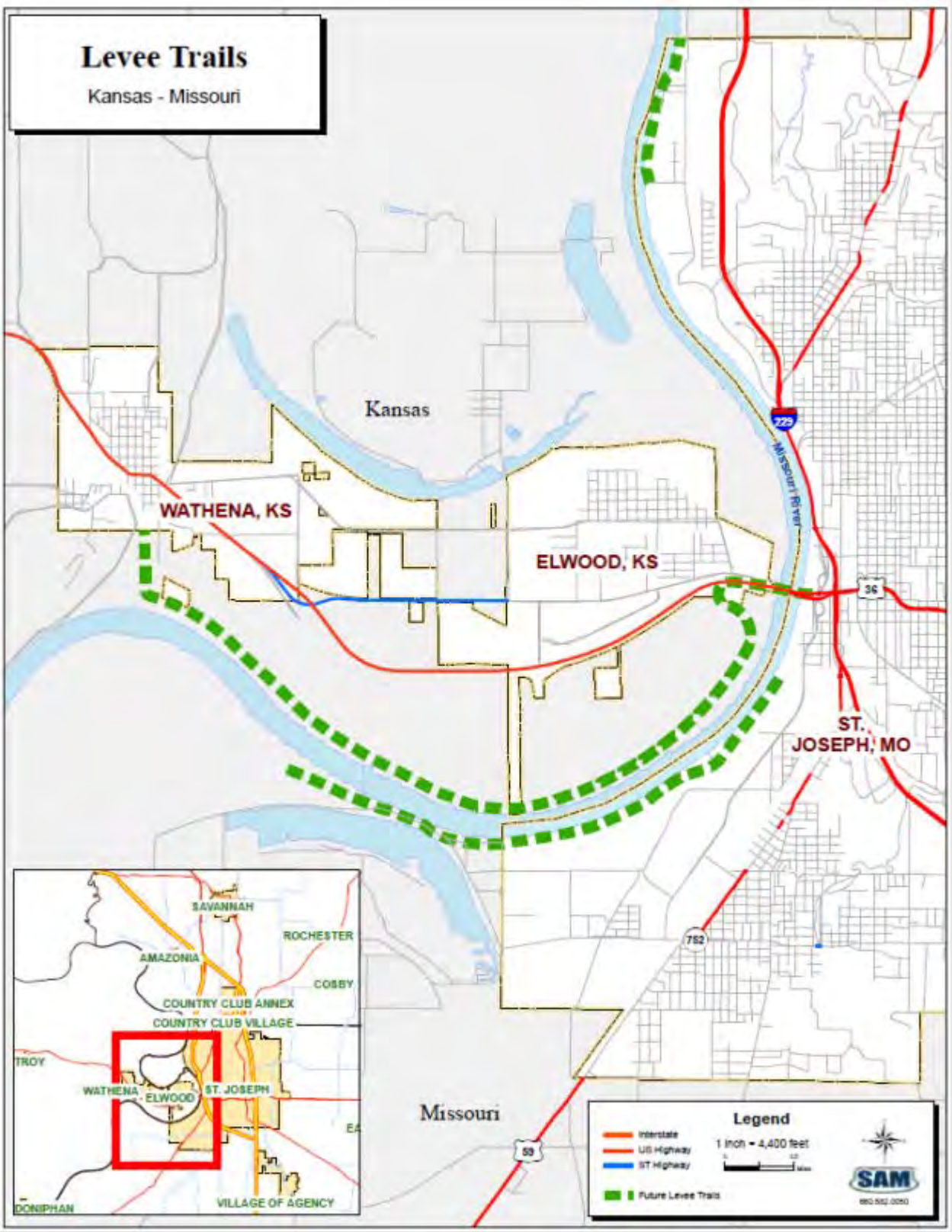
Such measures will likely be challenged out of the argument that "why should I spend money now for something that isn't here yet? Or I will do it if you can show me it will be done in five years or less!" The counter to the argument is that a project should not knowingly create a financial burden or safety concern for a planned project, regardless of construction schedule or timeframe. One dollar invested today saves many more dollars later – and safety itself is priceless.

Portions of the Quad State Trail that fall squarely within the MPO would be the following:

- Union Pacific & Chicago & Great Western Corridors – Middleton North through Country Club Village to Savannah.

- Union Pacific Corridor – Elwood through Wathena to the West
- Rock Island Corridor or Burlington Northern Corridor South toward Platte City
  Missouri River Levee System – Conservation Areas North and South




Levee Trails
Kansas - Missouri
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Missouri
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ELWOOD, KS
ST. JOSEPH, MO
Missouri River
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SAVANNAH
ROCHESTER
AMAZONIA
COSBY
COUNTRY CLUB ANNEX
COUNTRY CLUB VILLAGE
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WATHENA
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Future Levee Trails
1 inch = 4,400 feet
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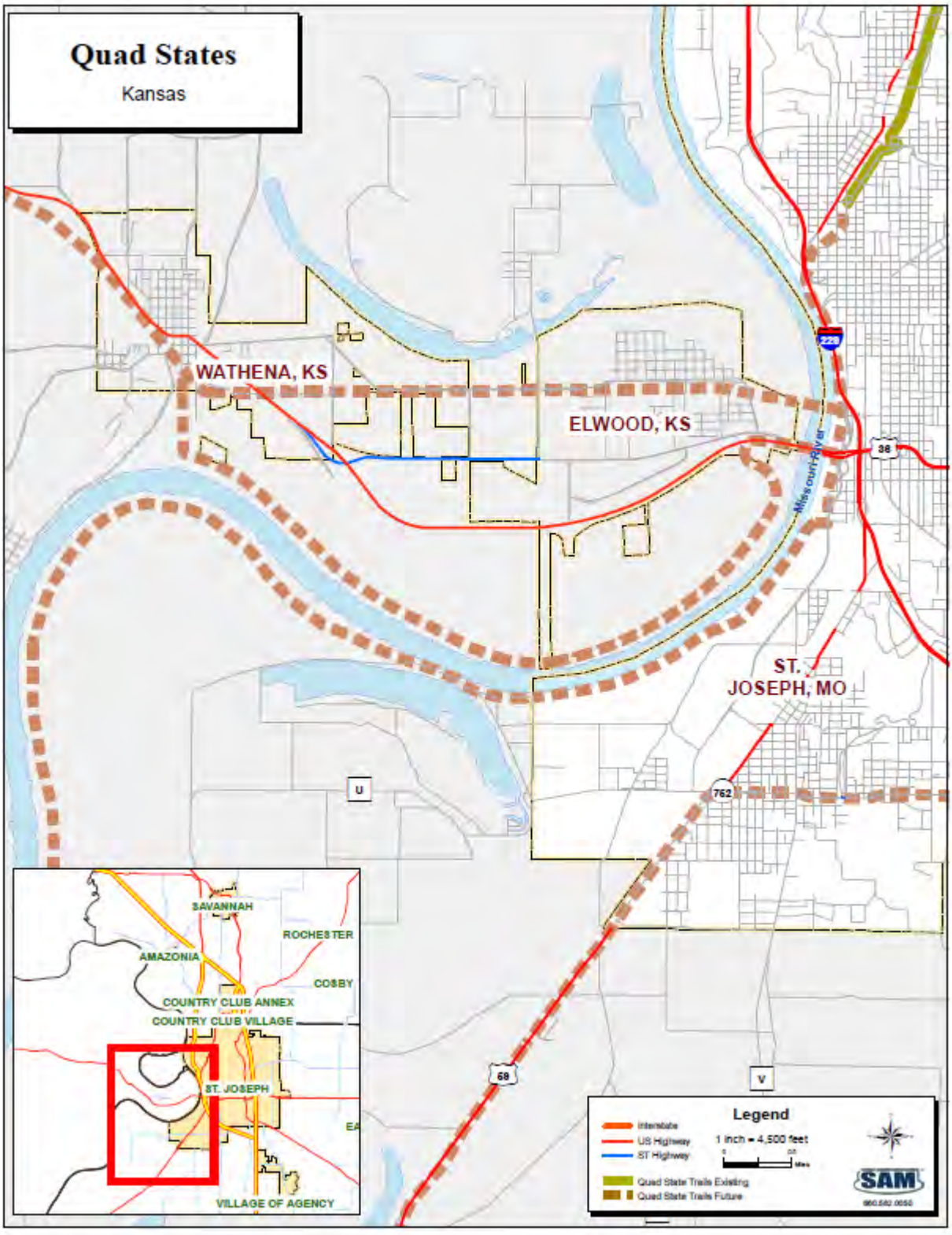
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US Highway
ST Highway
1 inch = 4,500 feet
Quad State Trails Existing
Quad State Trails Future
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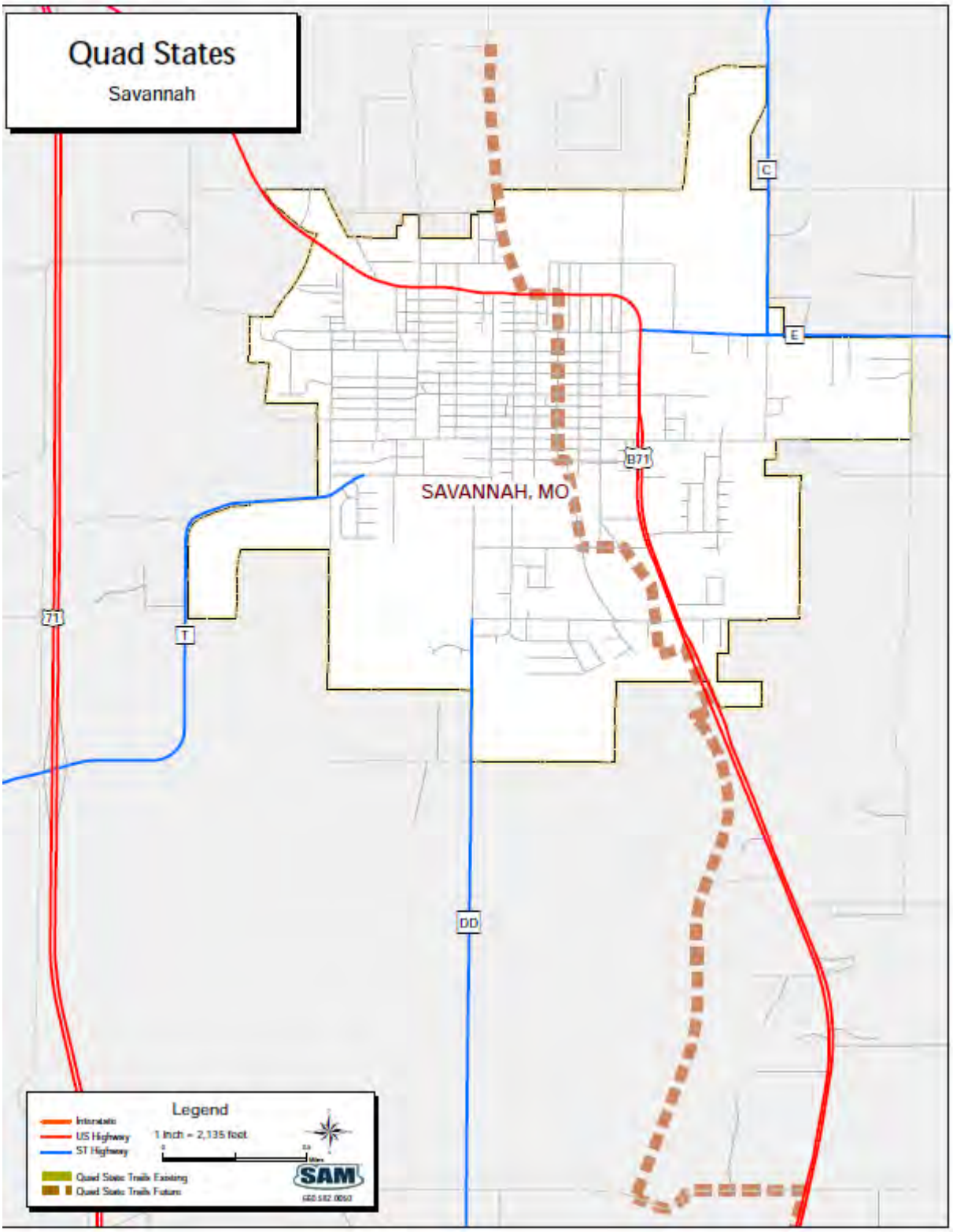
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Quad State Trails Future
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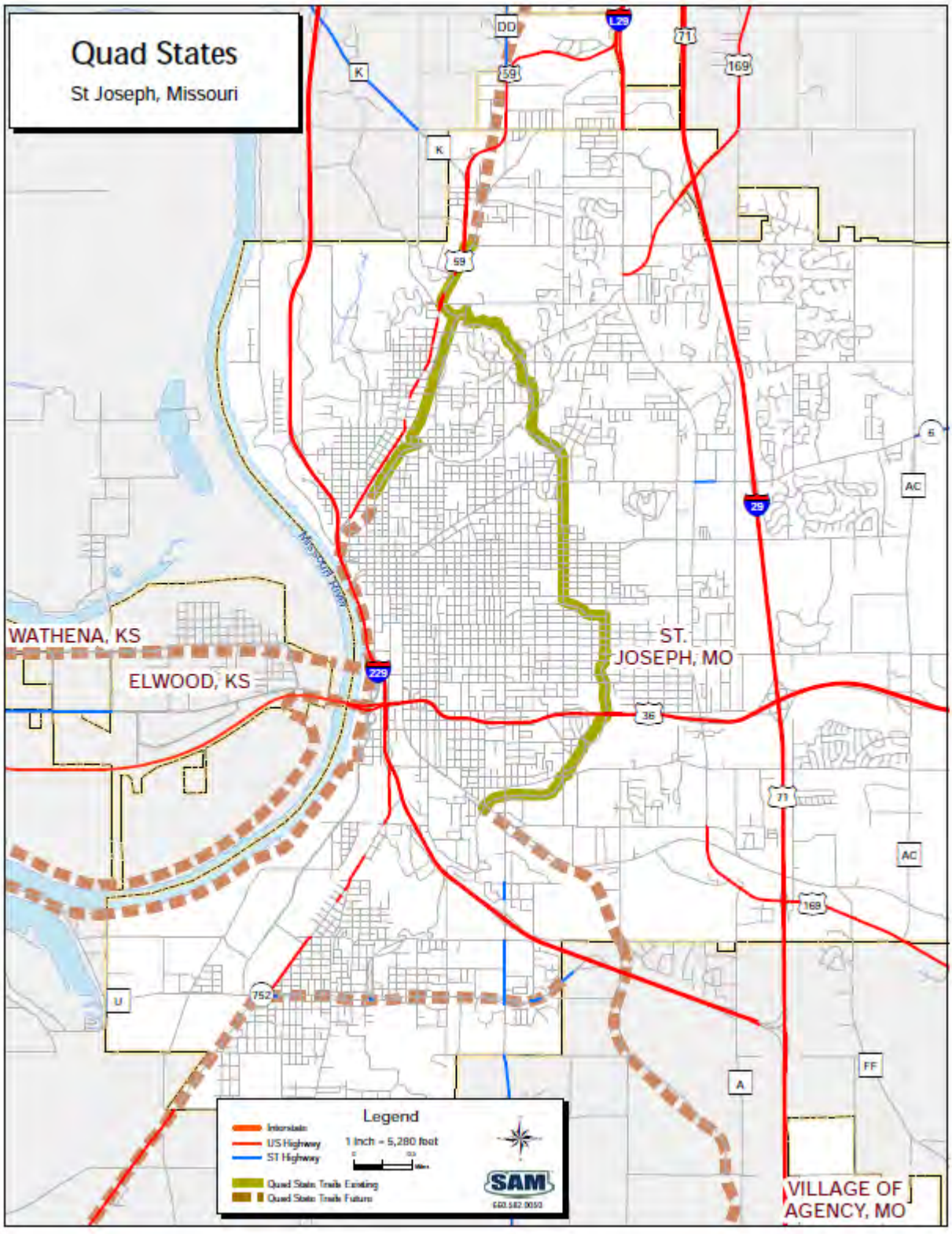
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1 inch = 5,280 feet
Quad State Trails Existing
Quad State Trails Future
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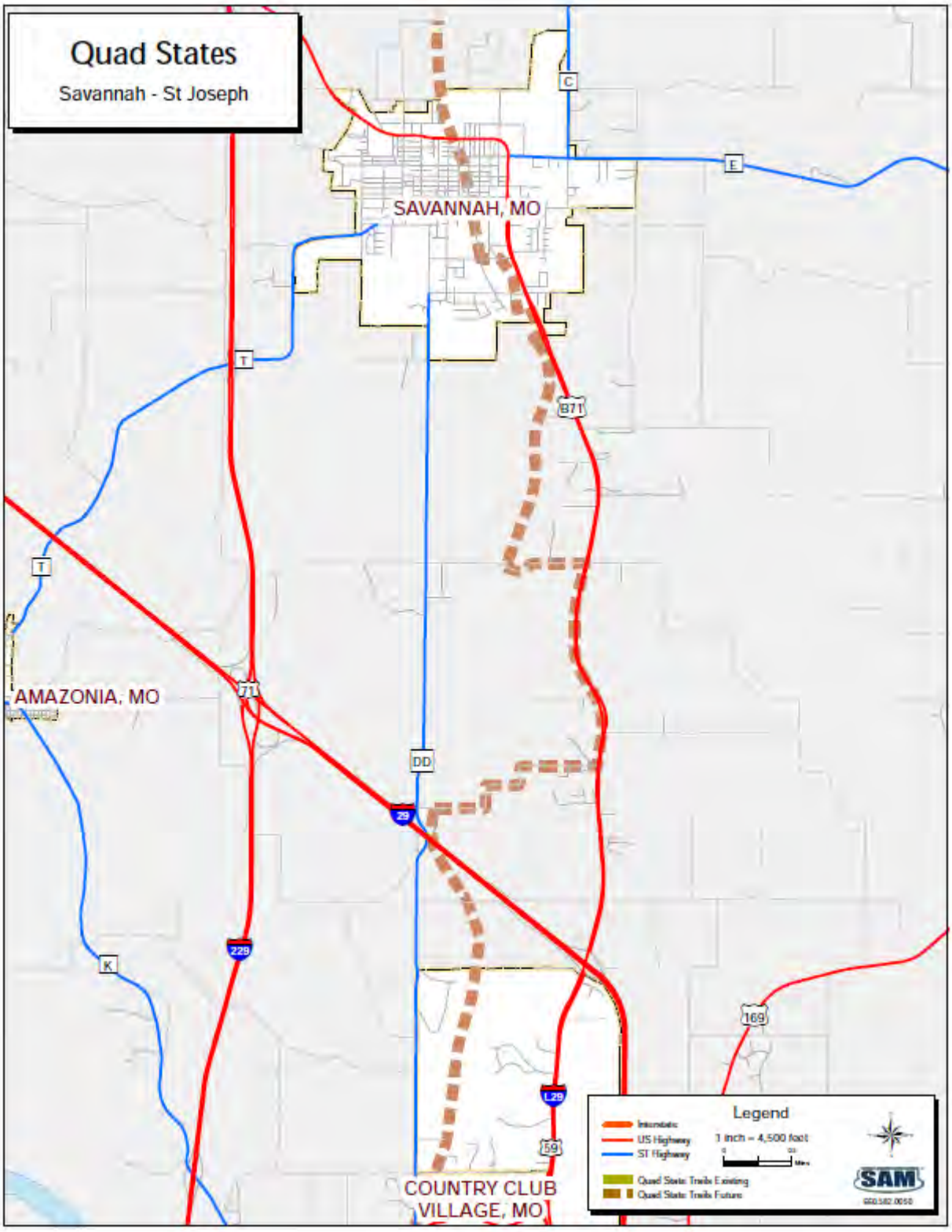
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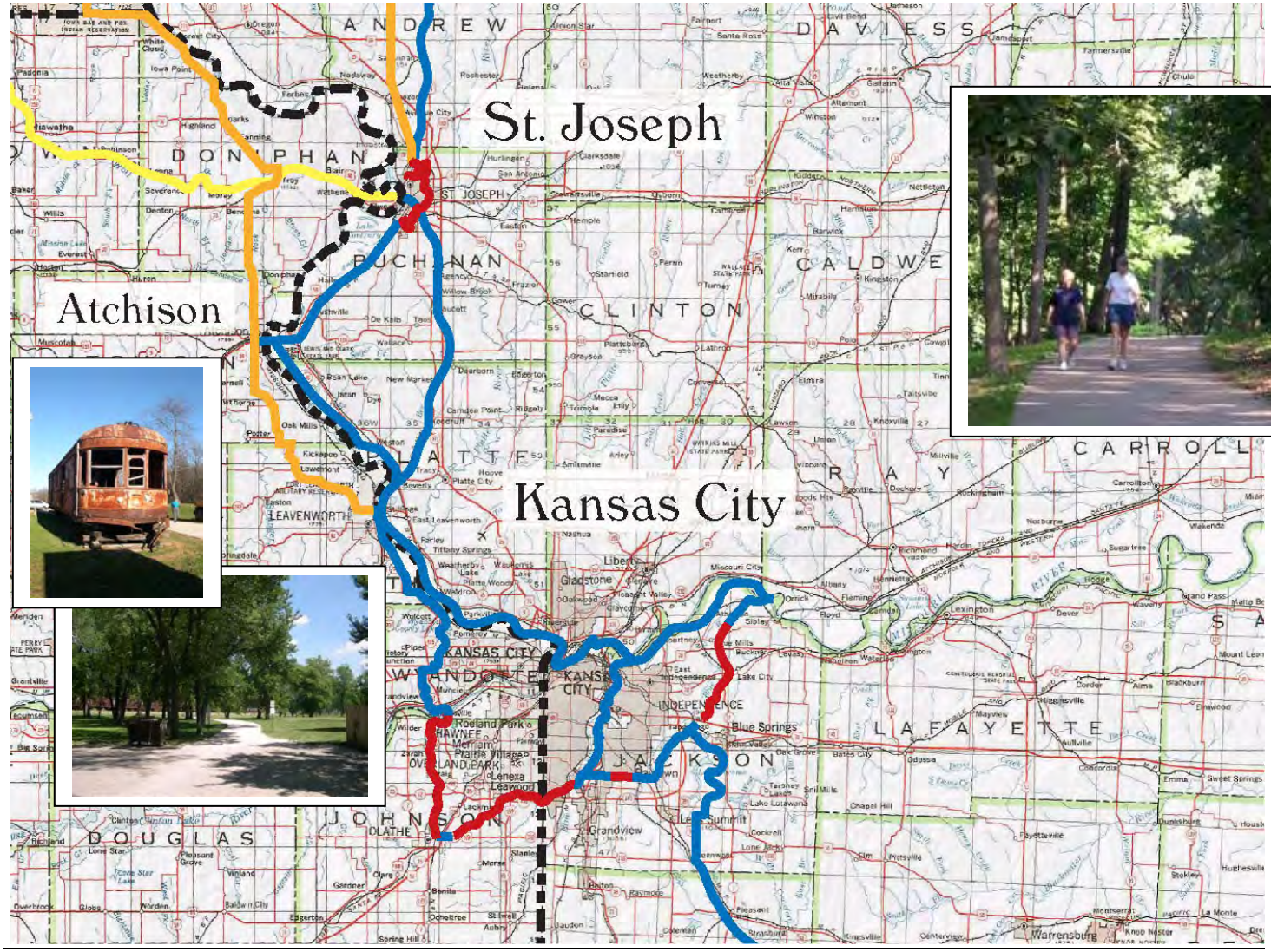
Interstate
US Highway
ST Highway
1 inch = 4,500 feet
Quad State Trails Existing
Quad State Trails Future
SAM

The area has a tradition of trails in its history-------

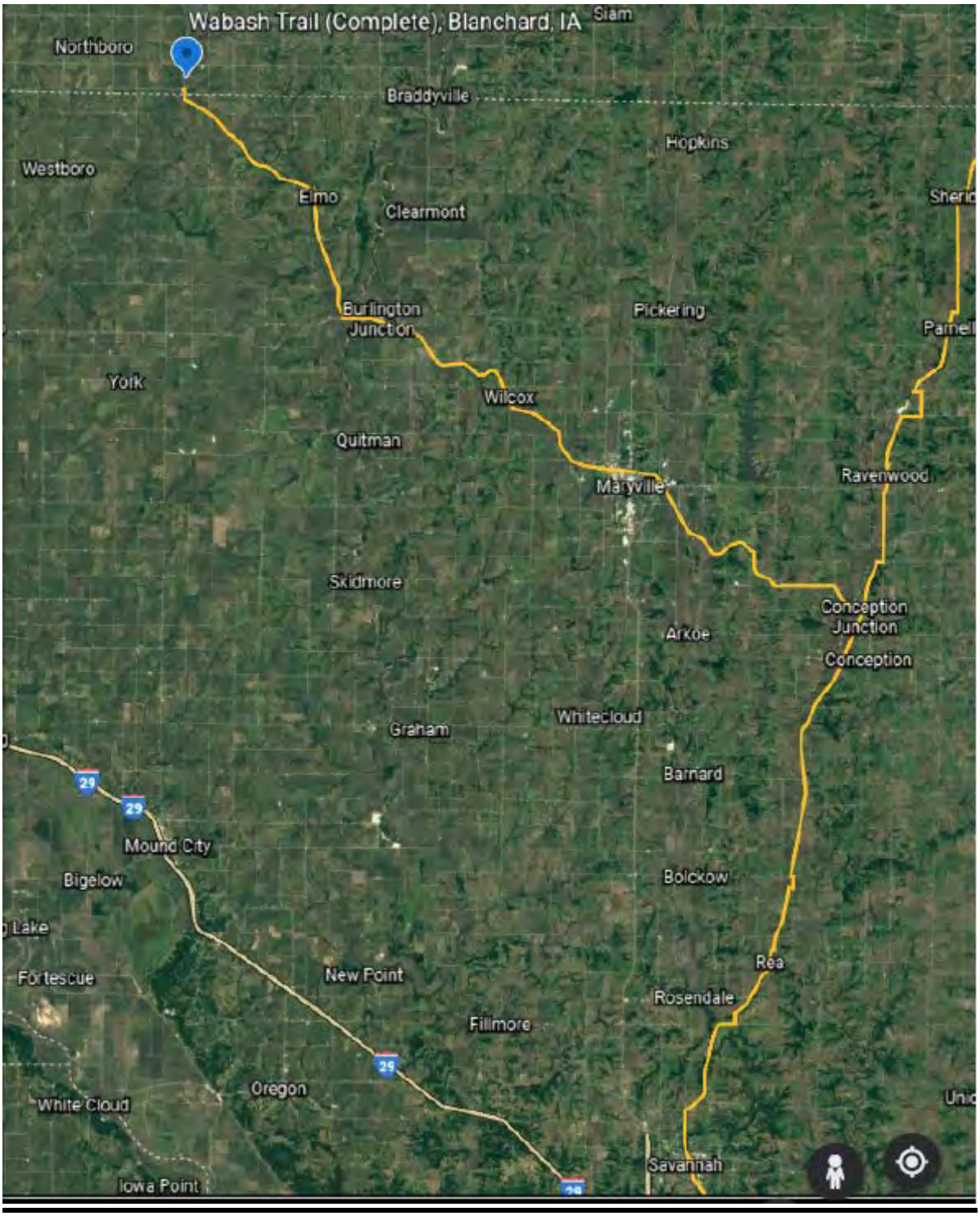

Omaha
Council Bluffs
IA
Lincoln
NE
Beatrice
MO
Marysville
St. Joseph
KS
Atchison
Kansas City
QUAD STATE TRAIL
Columbia
St. Louis
Jefferson City
Legend
Existing Trail-Open to the Public
Acquired R.O.W.-Trail Under Development
Future R.O.W. Acquisition
& Trail Development
Temporary On-Road Trail Segment
"Rail Watch" for Future Use


St. Joseph
Atchison
Kansas City
ANDREW
DAVIESS
DONIPHAN
BUCHANAN
CALDWELL
CLINTON
PLATTE
CARROLL
RAY
LAFAYETTE
JOHNSON
DOUGLAS
LEAVENWORTH
WYANDOTTE
JACKSON
CASS
Blue Springs
Lee's Summit
Grandview
Gladstone
Liberty
Lexington
Warrensburg

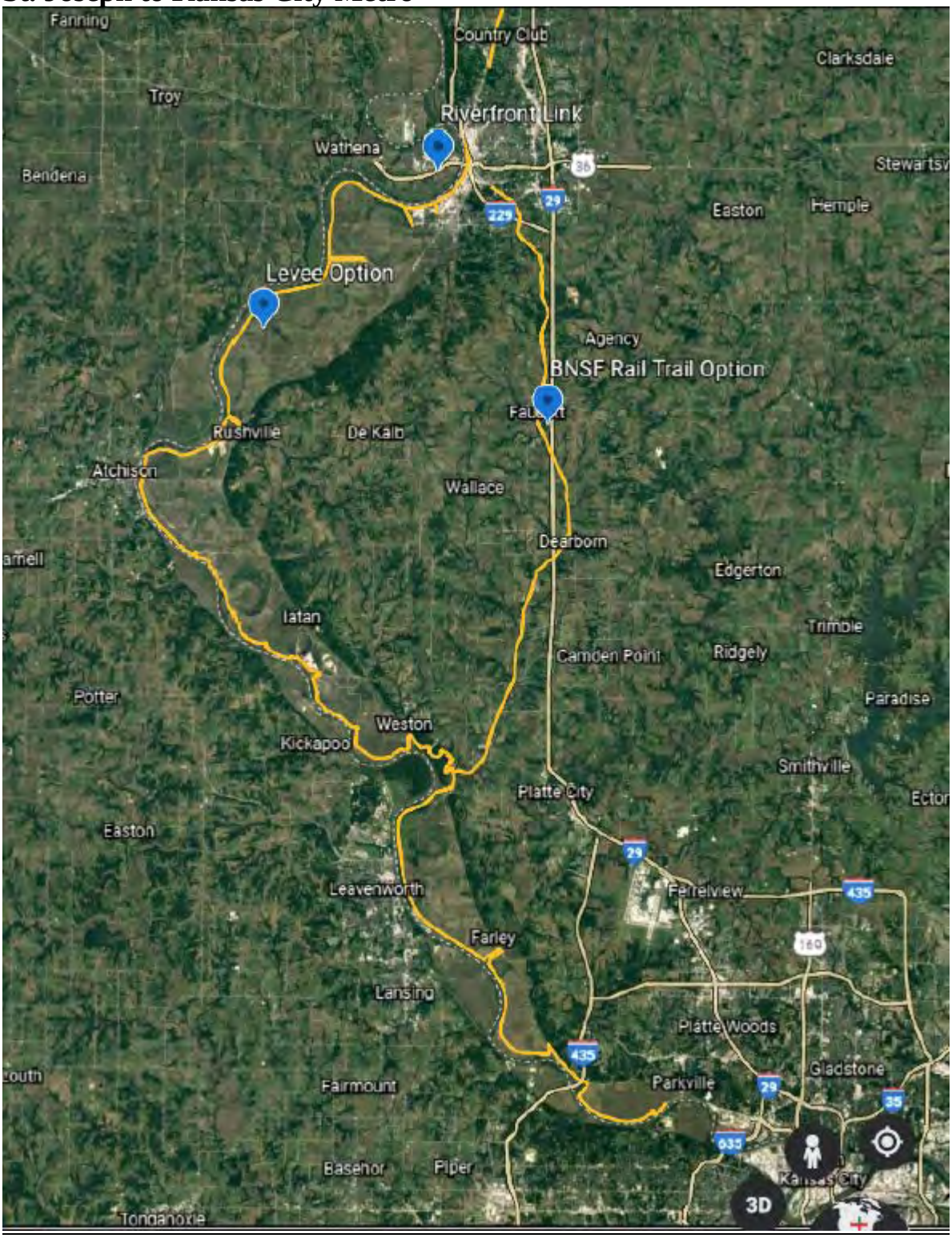
AMERICAN DISCOVERY TRAIL

Quad States Rural Corridors

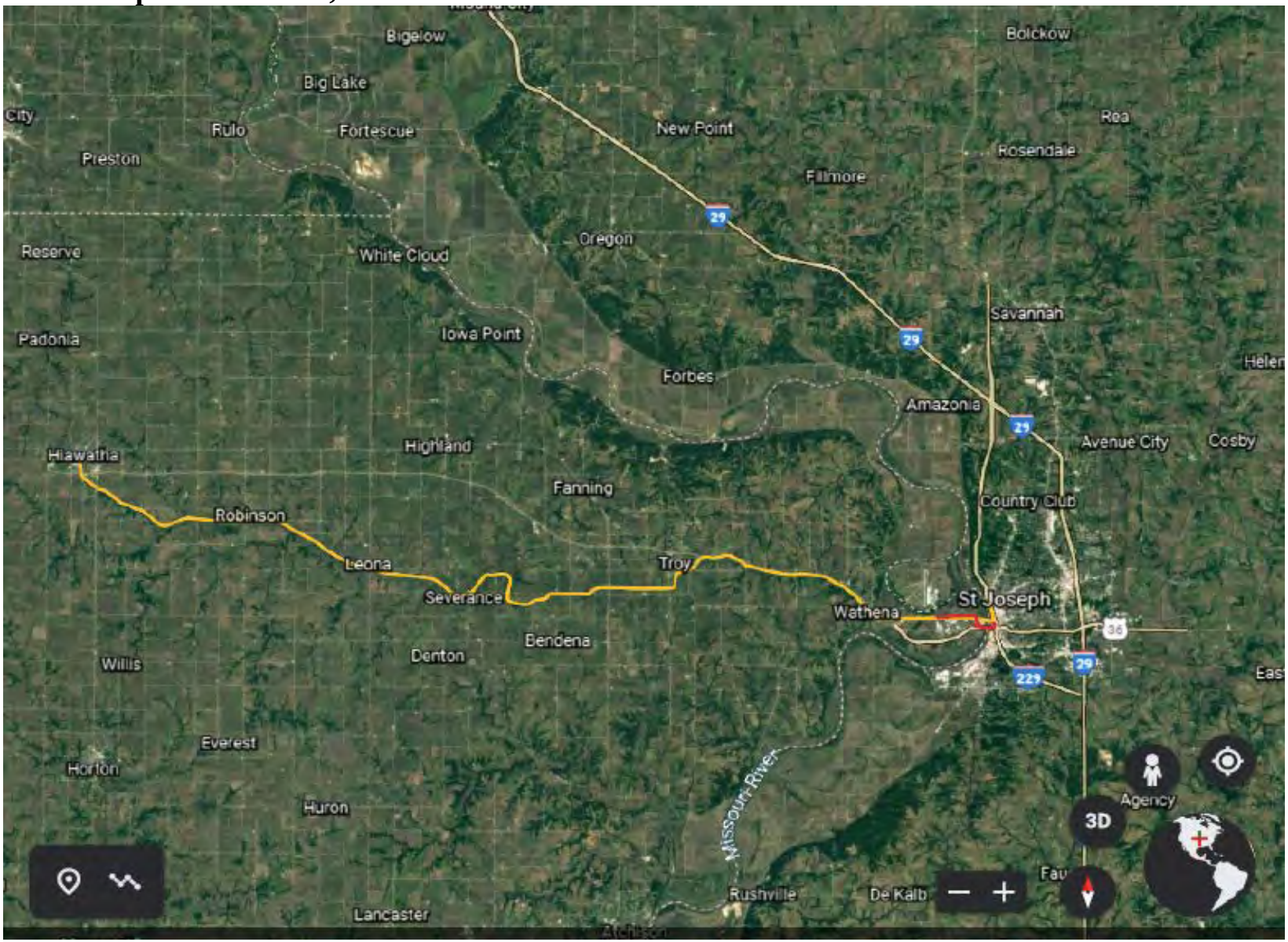
Savannah to Wabash



St. Joseph to Kansas City Metro



St. Joseph to Hiawatha, KS



RE-DEVELOPMENT & RE-HABILITATION
Transforming Our Community & Public Spaces

All communities are comprised of areas that are developing and re-developing. Other areas may be entering transitional phases, where existing land uses may be struggling but have not yet reached a critical mass to spark re-development. If areas do not re-develop, the properties involved will not be utilized at their highest and best use. Worse, they may become derelict properties with less attractive and less desirable uses over time. Often the time separation between the stages of "struggling" and re-development may take decades; in other instances, it is immediate and takes place in stages over a series of years.

The over-arching engines that drive development and re-development are the local and national economy + curb appeal. Then consider that study after study confirms that citizens consistently and repeatedly prefer to do business at locations that are accessible and attractive: the human factor that drives success and underscores the recipe for success.

Whether new or re-development is being powered by retail growth or residential growth, property does not develop or re-develop if the market to support the activity does not exist. Then envision that more timely influences regarding fuel prices, and citizen access (not simply consumers) via modes other than the personal car will become increasingly critical.

Lastly, walking, and biking demand an inviting environment. AASHTO and other guides do not dictate a sterile environment along our nation's highways and streets. In Todd Litman's 2003 report, *The Economic Value of Walkability*, he notes, "…the quality of walking conditions, including safety, comfort, and convenience are present in walkable communities. With respect to pedestrians, walkability and access go hand-in-hand. For those who are transportation disadvantaged or have limited mobility, walkability and pedestrian access are of particular

importance since they do not have access to other modes of travel." The Rudin Center for Transportation Policy and Management found that "addressing real and perceived concerns on safety, providing better access, and paying attention to aesthetics are all ways to address the factors that influence people's decisions on whether to walk or not."

AASHTO encourages design elements that improve the appearance of our roadway system. In Missouri, this particular approach has not gained a foothold in the urban areas, outside of highway interchanges. Requests to enhance with planting trees, etc.- are often greeted with "not on our ROW" or "you can if you'll sign an agreement". The goal should be that as owners and operators of a roadway, the landscaping components are viewed as an integral and important element – not simply vegetation maintenance. As such, third parties should be able to work with facility owners to include such work as part of the project, not add it later at third party expense. It is the distinction of being part of the community or operating in a community. It all benefits the quality of life of the citizenry. There is no "us" and "them".

At some point recognition needs to be made at several levels that our collective roadway system is the public or civic space of America. As such, one recognizes that the space is not solely intended for the automobile. In fact, our public roads are corridors within which a community does its business, lives, and invests in. A public space could be designed to be inviting and attractive, include street trees, sidewalks, and also support motor vehicles. Roadways do not need to be managed as an "all or nothing" proposition, where automobiles are the only mode that can and will be considered. That is the difference between a roadway through a community and the interstate system. The former should include a context sensitive design treatment and the latter is designed and operated to simply move the greatest number of vehicles at the highest rate of speed possible.

Amidst the constant development and re-development in a community, transportation projects are planned and scheduled on an on-going basis. Many of these projects could easily include elements that would in turn support full access, enhancing intra and inter neighborhood connectivity. Examples would be:

- Intersection projects that include ADA ramps and pedestrian signals; and
- Road/street re-builds that include sidewalks and wider travel lanes to share with bikes; and
- Bridge re-decks that include wider shoulders in rural areas and sidewalks and bike lanes or shoulders in urban areas. The MPO has adopted a formal position on this subject, included in the appendix; and
- New bridge construction that includes adequate shoulders for bike access and sidewalks for pedestrian access. The MPO has adopted a formal position on this subject, included in the appendix; and
- Bus turnouts to provide safe loading/unloading areas for transit users that access transit via bike or walking; and
- Landscaping elements, including street trees, the creation of planting strips between curb and new sidewalks, intersection landscaping, etc.-.

On the private side, opportunities exist to roll back the clock as a part of re-development. If the time in which an area originally developed did not require sidewalks, the re-development project

will. Investments such as this have benefits to the business in terms of customer access, represent a very low percentage of the overall cost of re-development (normally 2% or less), and bite off the problem of pedestrian barriers one project at a time. Just because a property did not have to comply with modern standards in the past does not mean that re-development doesn't need to apply now and forever. It benefits the citizen because the overall appearance within the corridor is enhanced and access is either established (at least in part) or extended over time; and it is financed with development dollars and not tax dollars. Simply put, it is the right thing to do.

Retrofitting

Retrofitting facilities along existing roadways can be a challenge. There are issues of curb type, clear zone width, horizontal location, etc.--- that have to be addressed, not to mention possible conflicts with utilities and ROW limitations. Admittedly, many of the national design standards are set forth in a piecemeal manner regarding sidewalks and curbs and can be easily misinterpreted.

To add clarity to the standards and requirements, one must focus upon the two most common and principal elements at issue with the subject:

1. Sidewalk location relative to the street or travel lane
2. Curb type

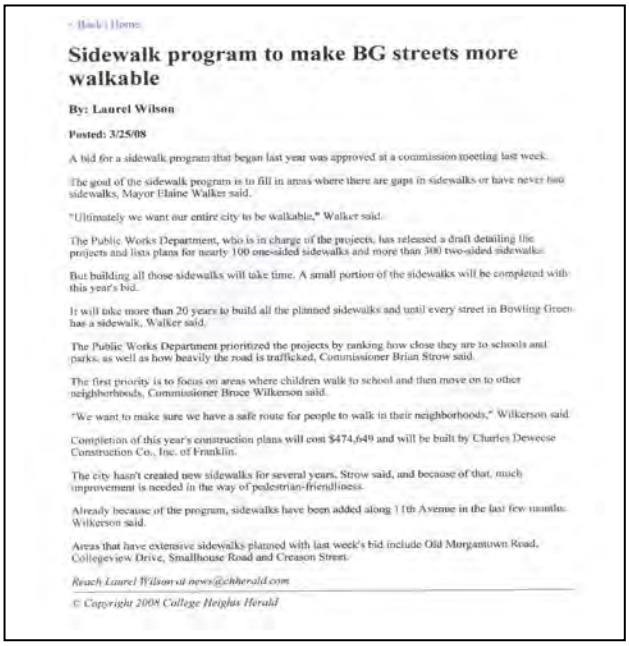
AASHTO states that "curbs are used extensively on all types of low-speed urban highways. In the interest of safety, caution should be exercised in the use of curbs on high-speed rural highways." AASHTO goes further, "vertical curbs should not be used along freeways or other high-speed roadways because an out-of-control vehicle may overturn or become airborne as a result of an impact with such a curb."

For retrofit projects, where roadway work is not being planned but private work adjacent to it is, curb placement requirements in AASHTO are important as follows: "Curbs with low, sloping faces may encourage drivers to operate relatively close to them. Curbs with less sloping faces may encourage drivers to shy away from them and, therefore, should incorporate some additional roadway width." Put simply, if a new retail operation were to locate along a street and construct a sidewalk, a sloping face curb (mountable curb) shall be the curb utilized unless the owner of the roadway itself is planning to widen the travel lanes themselves to accommodate the shy distance needed with this curb type. If the curb type is already a vertical curb, it is assumed that the shy distance has already been incorporated in the original design. Sidewalk construction, by itself, would not require a change in curb type regardless of the existing curb in place.

On page 362, AASHTO accounts for shy distance and states that "where sidewalks are placed adjacent to the curb, the widths should be approximately two feet wider than those widths used when a planted strip separates the sidewalk from the curb." This would mean that in re-development areas with pre-existing curbs, a curb type change would not be required (from previous section) but a wider sidewalk would if butted against the back of curb.

AASHTO goes on to say that "as a general practice, sidewalks should be constructed along any street or highway not provided with shoulders, even though pedestrian traffic may be light." Further, "justification for the construction of sidewalks depends upon the potential for vehicle-

pedestrian conflicts. In general, wherever roadside and land development conditions affect regular pedestrian movement along a highway, a sidewalk, or path area, as suitable to the conditions, should be furnished." Page 400 says "sidewalks used for pedestrian access to schools, parks, shopping areas, and transit stops and placed along all streets in commercial areas should be provided along both sides of the street."



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Sidewalk program to make BG streets more walkable

By: Laurel Wilson

Posted: 3/25/08

A bid for a sidewalk program that began last year was approved at a commission meeting last week.

The goal of the sidewalk program is to fill in areas where there are gaps in sidewalks or have never had sidewalks, Mayor Elaine Walker said.

"Ultimately we want our entire city to be walkable," Walker said.

The Public Works Department, who is in charge of the projects, has released a draft detailing the projects and lists plans for nearly 100 one-sided sidewalks and more than 300 two-sided sidewalks.

But building all those sidewalks will take time. A small portion of the sidewalks will be completed with this year's bid.

It will take more than 20 years to build all the planned sidewalks and until every street in Bowling Green has a sidewalk, Walker said.

The Public Works Department prioritized the projects by ranking how close they are to schools and parks, as well as how heavily the road is trafficked, Commissioner Brian Strow said.

The first priority is to focus on areas where children walk to school and then move on to other neighborhoods, Commissioner Bruce Wilkerson said.

"We want to make sure we have a safe route for people to walk in their neighborhoods," Wilkerson said.

Completion of this year's construction plans will cost $474,649 and will be built by Charles Deweese Construction Co., Inc. of Franklin.

The city hasn't created new sidewalks for several years, Strow said, and because of that, much improvement is needed in the way of pedestrian-friendliness.

Already because of the program, sidewalks have been added along 11th Avenue in the last few months, Wilkerson said.

Areas that have extensive sidewalks planned with last week's bid include Old Morgantown Road, Collegeview Drive, Smallhouse Road and Creason Street.

Reach Laurel Wilson at news@chherald.com

Re-development is truly an opportunity where the private side can support the goals set forth by local government to change the makeup and appearance of its public spaces: the roadway. Government can lead the way by including similar elements in its projects such that it does not create barriers for future projects. This is a two-fold charge for government as isolated projects (for example a new bridge) or a new roadway should include such provisions from day one. It's difficult enough to dig out of the backlog of building projects designed the wrong way since the 1950's, without making the challenge yet greater into the new century.

As the policies approved by the MPO established, planning for non-motorized access is a "pay as you go" proposition, not "I'll build it when they come". If the latter proposition had been in play before the interstate concept was born, the nation would not have the interstate system itself.

SIDEWALK STANDARD REQUIREMENTS
in
In-Fill & Re-Development Areas

1. Require sidewalks where land use changes, new construction, facility expansions, major renovations, or re-development is more likely to occur over time.
2. Major employment areas where new development, re-development, major renovations, or facility expansions are likely to occur over time. These same areas are major generators and attractors of transit users, bicyclists, and pedestrians already. Focusing upon safety improvements to support modal trip alternatives is prudent.
3. Minor and major retail and commercial areas where new development, re-development, major renovations, or facility expansions are likely to occur over time.
4. Designated streets that have been identified to be especially important to develop pedestrian access because of land use, proximity to other areas (i.e. in a retail area immediately adjacent to a residential area), or strategic location (i.e. a gap created between areas that have or are developing sidewalks),
5. On a lot by lot basis, property owners will begin to provide access to their businesses, from one business to the other, and establish at least short sections of a safe pedestrian infrastructure, thereby eliminating:
    a. Americans with Disabilities Act barriers on a lot by lot basis
    b. Provide the same level of public facilities already required in newly developed subdivisions.
    c. Over time link with adjacent property owner improvements and provide corridor wide access.
    d. Provide access to larger segments of the community for:
        i. Elderly; Students; Children
        ii. Title VI and Environmental Justice (low income and minority) populations; especially important when tied to the first or last portion of a transit trip and the barrier to transportation and access a lack of facilities would represent
        iii. Physically disabled citizens; Transit dependent citizens; Employment; Healthcare; General mobility; Physical fitness; Quality of life

Factors That Trigger Sidewalks for Re-Development

Retrofitting the community to develop bicycle and pedestrian access over time is concentrated in areas of in-fill new construction, re-development, change of use, rehabilitation/renovation or facility expansion in areas of commercial or industrial land use, and residential subdivision projects, many of which are located on arterial and collector streets (busier streets).

Single-lot, residential in-fill or re-development is not typically a focus area given the rate of change and the corresponding likelihood that multiple connections and access will be accomplished over a period of time. Typical residential areas are mostly stable and tend to remain static, in terms of a critical mass that would involve a wholesale upgrade or change to either the building fabric of multiple structures or change of use, ranging from 50 years or more into the future. If a large-scale rehabilitation were to occur, for example the purchase and new

construction/rehabilitation of an entire city block, sidewalks would be triggered out of recognition that the development itself would utilize the facilities and a significant impact toward providing access would be realized.

The factors considered to require sidewalks for re-development, new construction, change of use, new construction (not related to new major or minor subdivisions that shall include sidewalks in all scenarios), facility expansion, or renovation/rehabilitation shall be as follows (***a positive response to <u>any of the</u> <u>six</u> questions or its subsets shall require sidewalks***):

1. Is the site located on a roadway with a functional classification of collector or arterial or is it a designated roadway of focus?
2. Is the use of the building or property being changed? (i.e. is a building changing from office building to retail, residential to retail, industrial to retail?)
3. Is the site or structure being significantly altered? ("altered" being defined as significant site work, 50% or more of the interior space being either renovated or rehabilitated)
4. Is the site undergoing new construction where 40% or more of the frontage area is being disturbed?
5. Is a structure undergoing a building addition, or is a new structure being constructed, greater than 5% of the gross square footage of the principal/existing structure on the site?
6. Is the site located on a strategic link that may join existing sidewalk systems with developing ones?
7. Would the cost of sidewalk development constitute 2% or less of the overall re-development project? If more than 2%, reduced requirements shall still apply (i.e. constructing a part of the larger project, etc.---)

Making the Case

Of course, the requirement for sidewalks in new subdivisions is not a new issue or one that is controversial. Most communities have required sidewalks on both sides of the street for decades or more now. This requirement is applied to all types of subdivisions, whether residential or industrial. Common rules such as this keep the gap between areas that have facilities and those that do not from widening on a yearly basis.

While the plan to retrofit the community is implemented over time, challenges will be leveled along the lines of:

- The sidewalks lead to nowhere.
- Why put sidewalks on a bridge if they do not connect to anything?

The responses are:

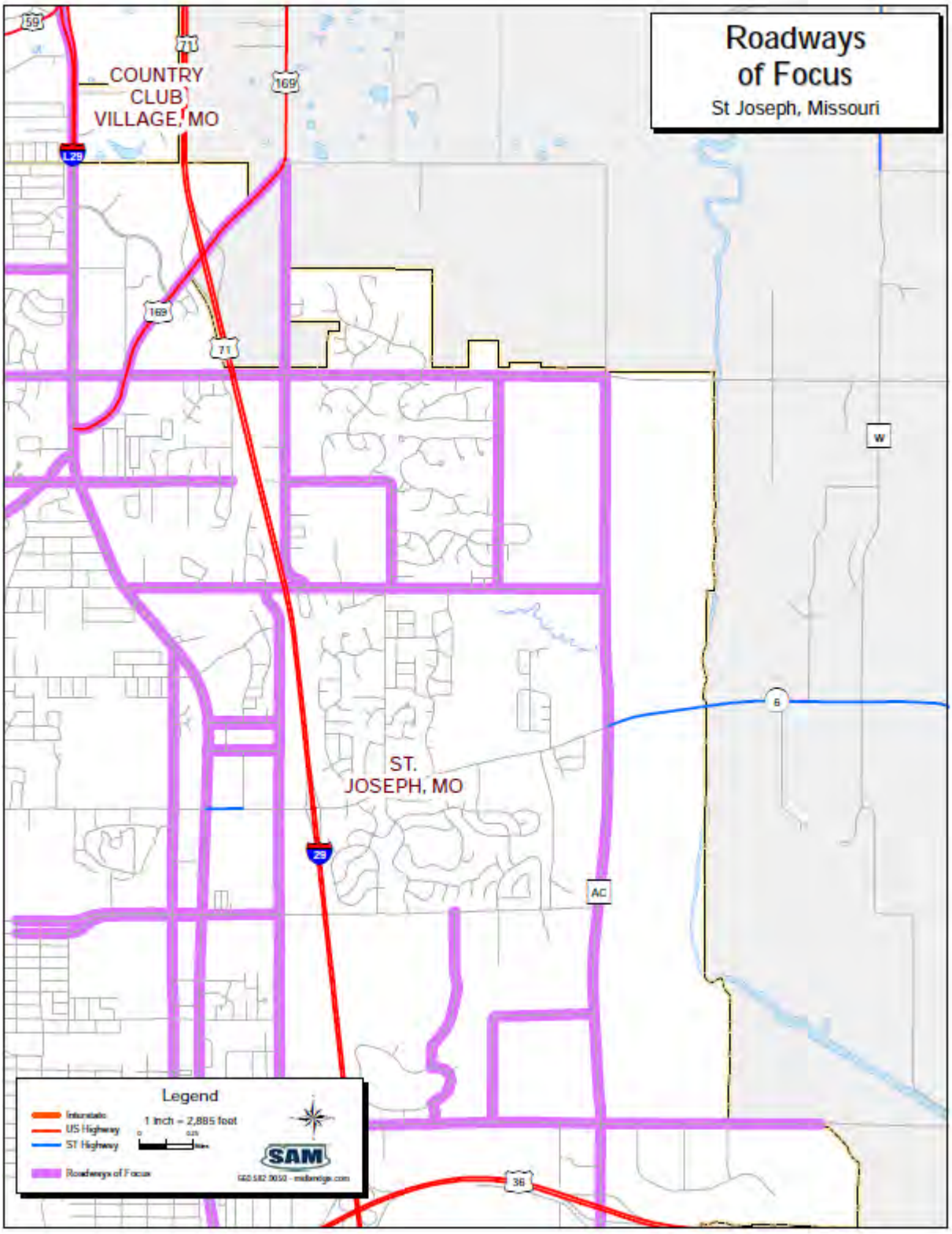
- The sidewalks do lead to somewhere. Even the limited sections provide safe pedestrian access for at least a short section. Much like new residential construction, connections are made one property at a time. If even one property does not include sidewalks, one may have to wait decades to do it right again. In the interim pedestrians would be walking in ditches and in the street. That is not a positive for an area

priding itself upon mobility, safety, and quality of life. Even the short sections are being used in the meantime.

- Bridges have useful lives in excess of 50 years and, with effective maintenance, often operate far beyond that time period. Even bridge re-decks have useful lives of 30+ years.

Given the useful life of the improvement, the connection argument has no foundation. If a bridge were only expected to last five years, it would be logical to state that including sidewalks on a bridge with no plans to attach to sidewalks in five years or less would be less than prudent. However, the safety benefit of providing sidewalk connections during the interim between existing and future conditions is considerable. Walkers, bikers, and wheelchair bound users can all safely pass through constriction points and avoid conflicts (like being caught between a car and a guardrail as in the above photo).

However, bridge structures are built to last a long time and local development and decision making varies greatly during such a time span. More importantly, not including basic elements with a bridge creates a local financial burden (it costs more to design and construct later), which is completely contrary to the MPO planning process and is not compliant with context sensitive design. The MPO's mantra is: plan for tomorrow, do not create barriers for another party, do not create or re-create safety issues, support full and complete designs for all modes, and spend the public dollar in a manner consistent with the expectations of the local community.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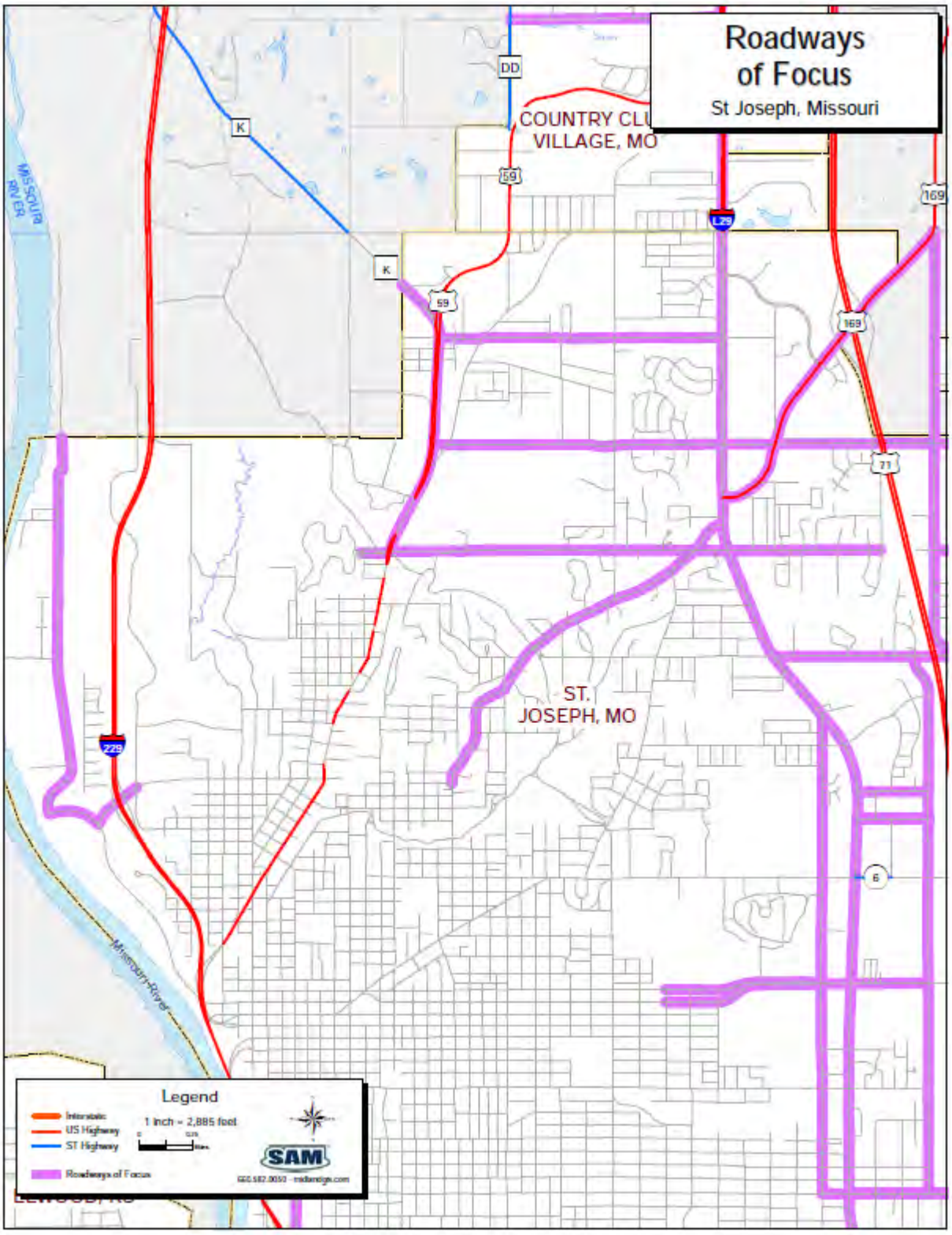
Roadways of Focus
1 Inch = 2,885 feet
SAM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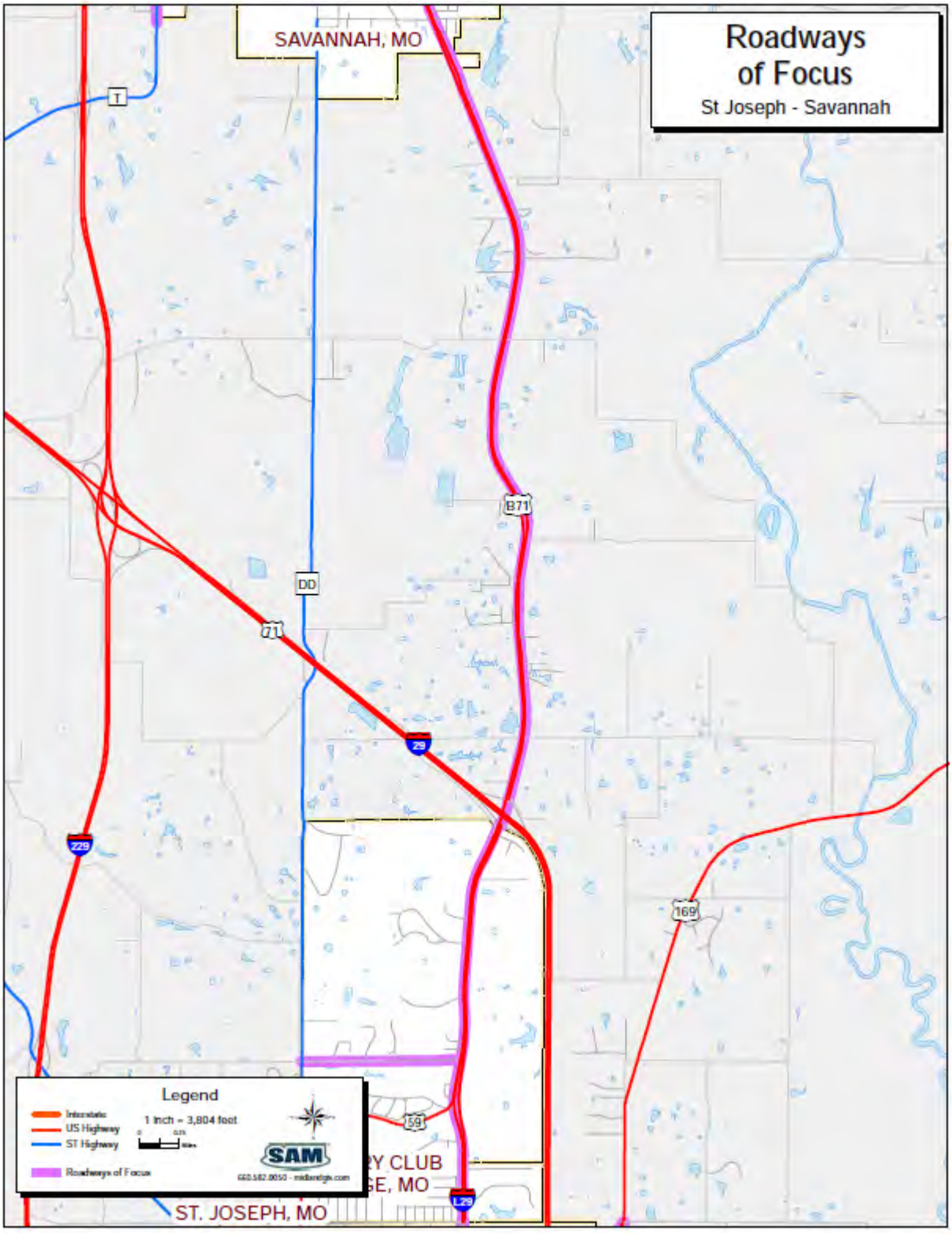
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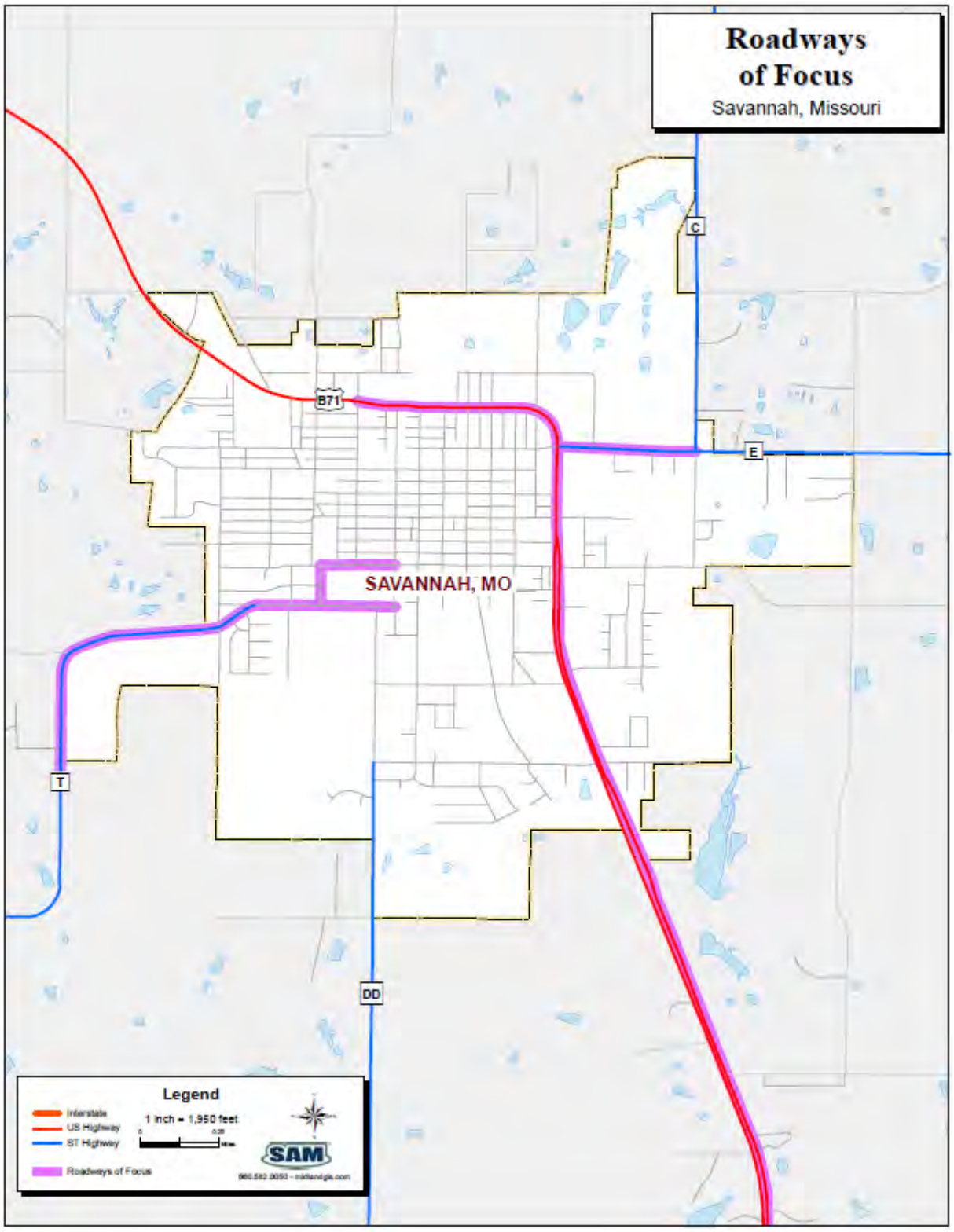
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Roadways of Focus
1 inch = 1,950 feet
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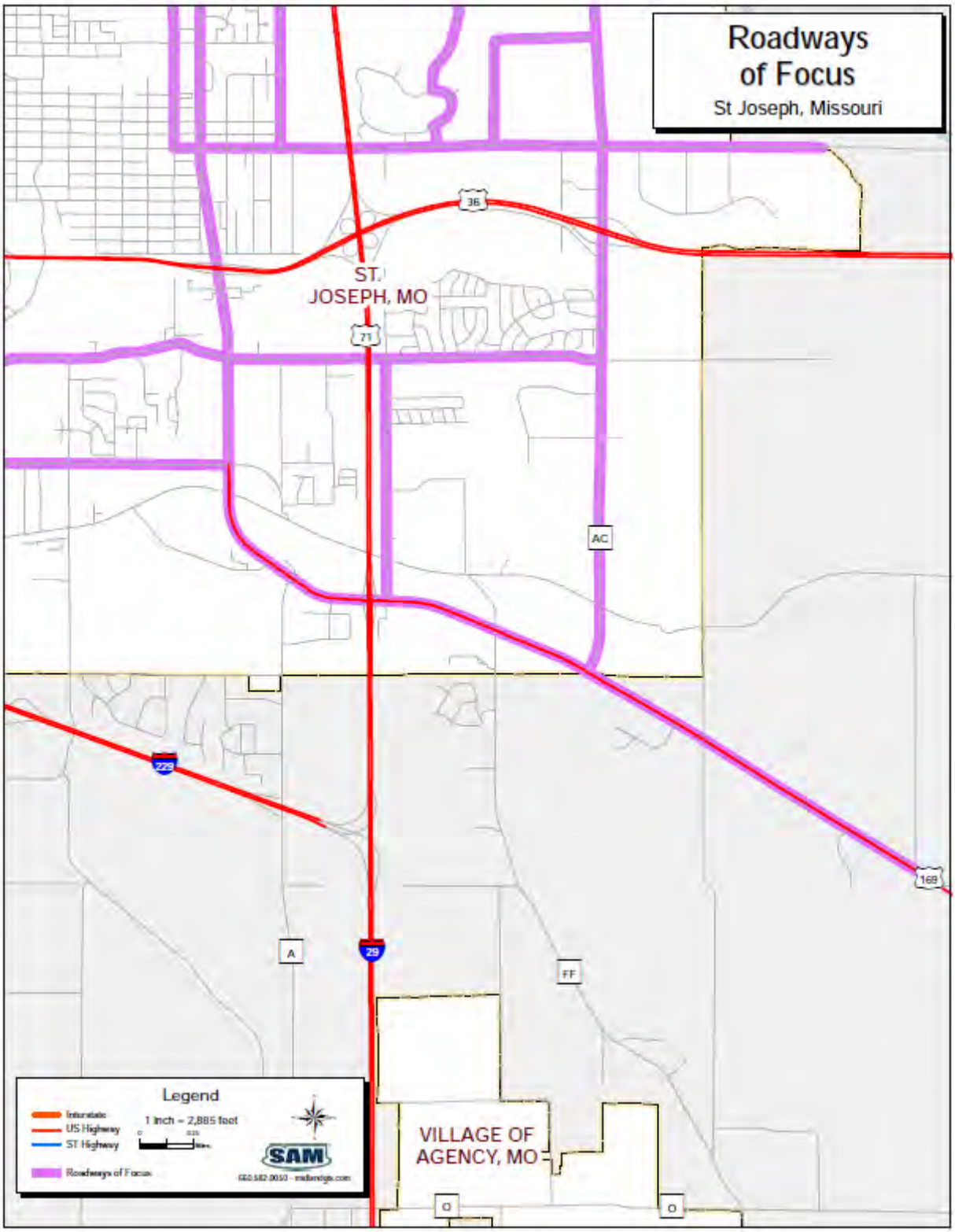
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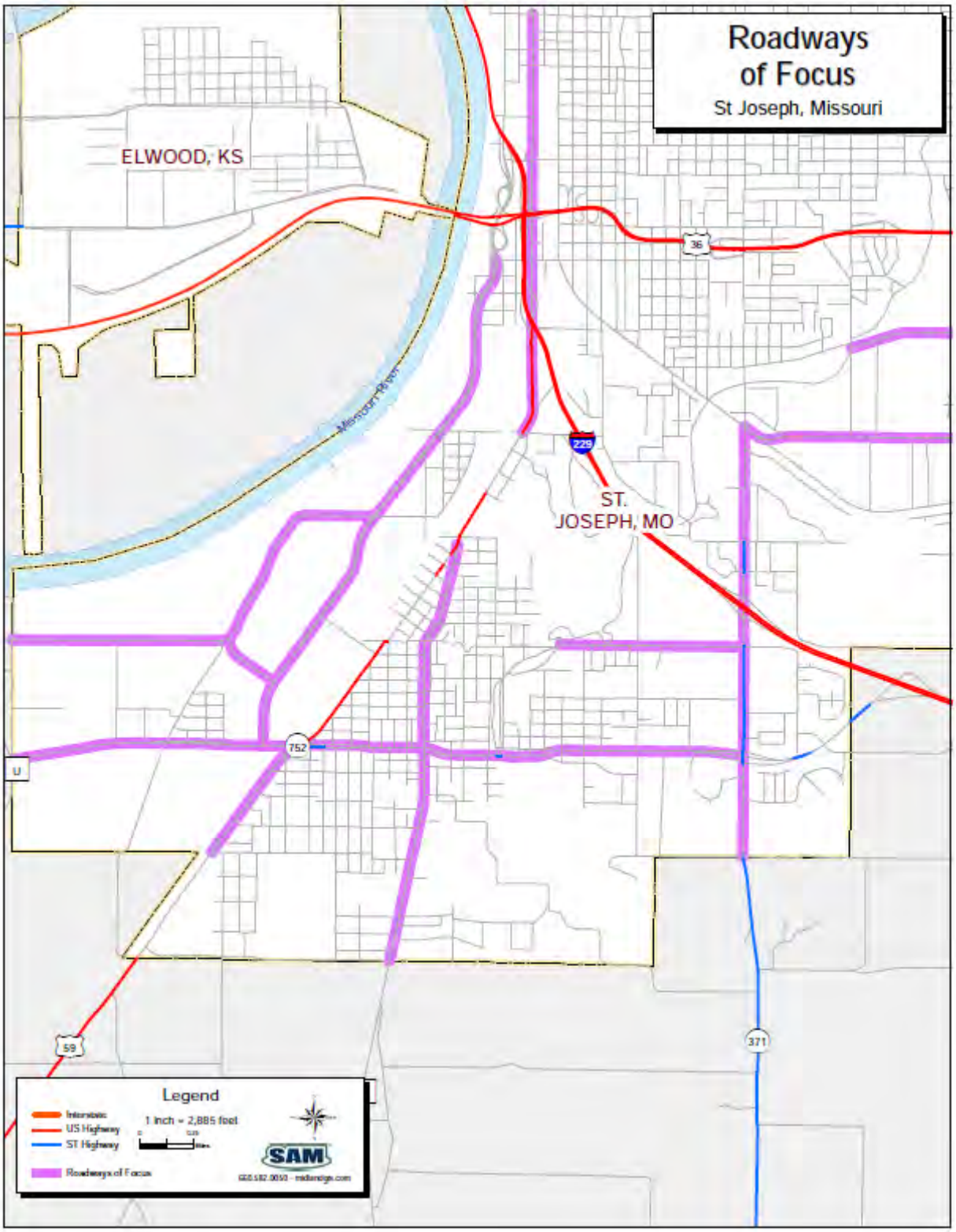
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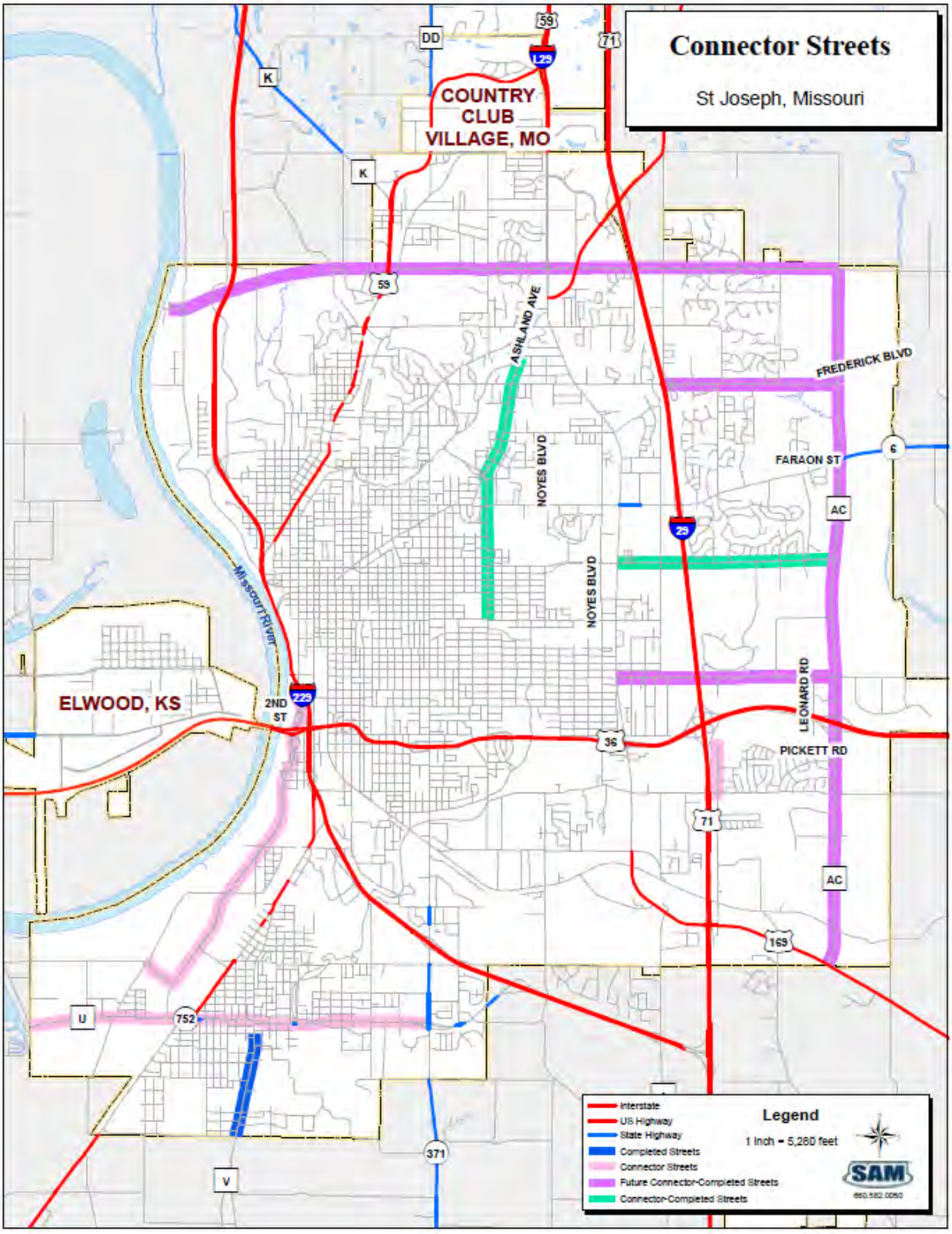
Connector Streets
St Joseph, Missouri
COUNTRY CLUB VILLAGE, MO
ELWOOD, KS
Missouri River
ASHLAND AVE
NOYES BLVD
NOYES BLVD
FREDERICK BLVD
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SAFE ROUTES TO SCHOOL
Kids Walk & Bike – Don't They?

Safe Routes to School is a concept that has been around for as long as sidewalks and roadways have been in existence. Early planners, engineers, and city builders intuitively knew that children would walk or bike to and from school. They did then and they do now.

One can observe this practice by simply paying attention during the school year. One will see students playing outside on swings, playing basketball, skateboarding and just 'hanging out'. During the summer break it is quite common to see children involved in the same activities, as well as adults. The majority of kids walk or bike to the school in these examples. A school is truly a community center.

Children often walk or bike from home to their school in the evenings to attend after school functions, whether a sporting event or school sponsored program. As buses are not available to transport kids for these types of events, children are left to rely upon their feet, a bicycle, or parents. Many choose the feet or bike or would if a safe route existed to access their school. For lower income neighborhoods, walking or biking may be the only way a student can be involved.

Schools themselves function as activity centers for the community overall, and neighborhoods specifically. Many residents select homes because of their proximity to a school. As such, schools have actually driven development patterns in the past. Many a parent has been heard to say that "I bought this house because it's walking distance to school".

As a result, there is a natural, symbiotic relationship between a school, its neighborhood, and residents. If a neighborhood begins to fail, so too does the school population. Public health and obesity rates are affected directly as well.

The Safe Routes to School federal program should not be confused with the grass roots concept of providing a safe and effective means for children to walk and bike to their school and return home. The federal program has principally supported a funding mechanism whereas the larger concept is about a neighborhood scale quality of life. Cities across the Nation have been sponsoring programs such as "Walk Your Child to School Day" and the "Walking School Bus" for years before a federal funding program was established (unfortunately a very small amount of funds is available currently).

Safe Routes focuses upon the four elements necessary to encourage children to walk and bike to school:

1. Education - Teach walker and bike safety courses for children. There are safe and unsafe behaviors that can enhance or detract from the experience. Recognizing unsafe characteristics can, through education, address such instances. Reinforcing and encouraging safe behavior can enhance the activity.
    a. Educators- Schools can be the most effective advocate for biking and walking for students, but absent proper education many staff members may be afraid to encourage students to bike and walk. Some staff may even actively discourage the only viable option that many children have to access their community center, let alone many other children that should be encouraged to walk or bike for the health benefits alone.
    b. Parents- Similar to educators, many parents are not comfortable with allowing their children to walk or bike to school. Parents can also be important forces in teaching proper techniques to safely walk and bike.

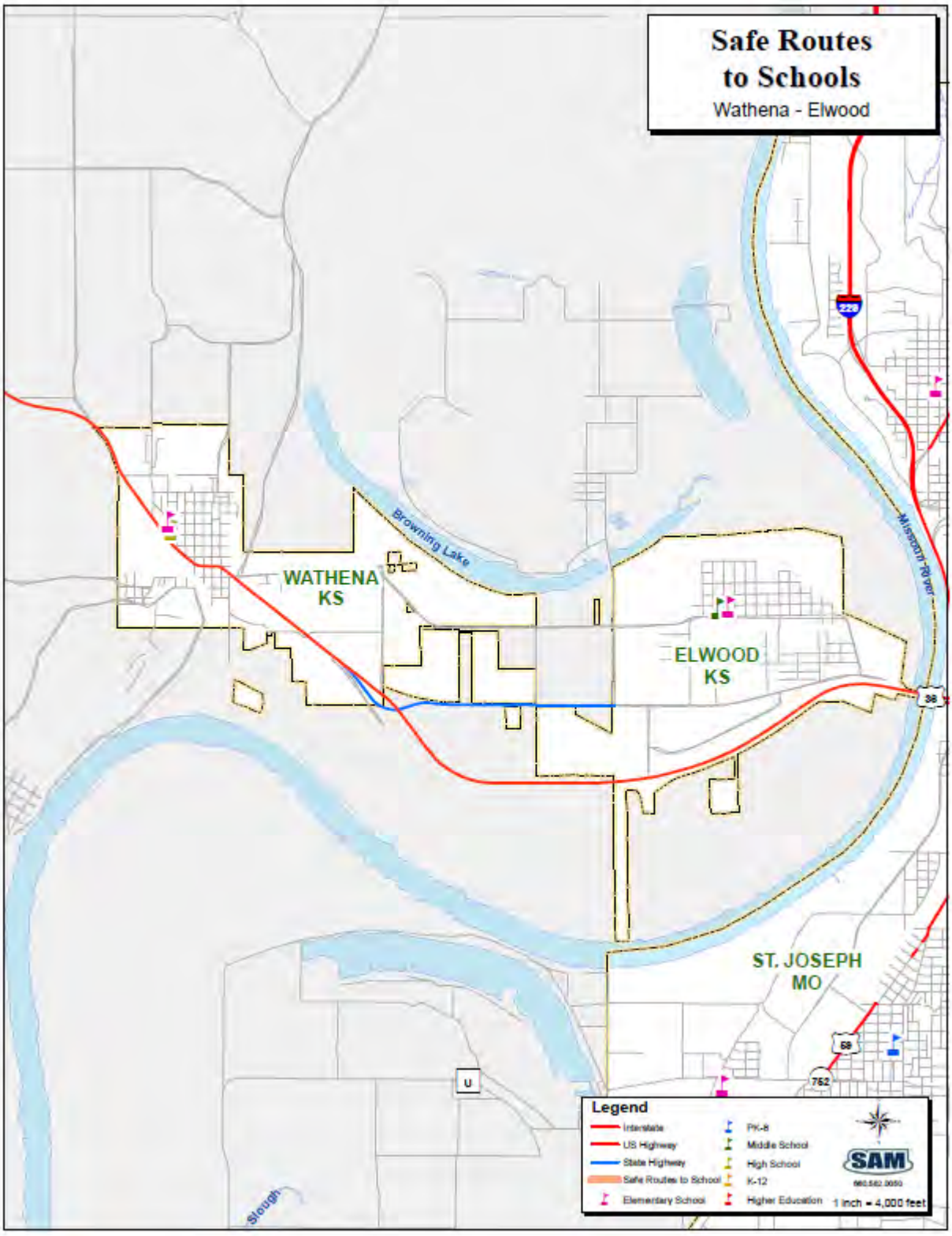
2. Safety - Focus upon education for parents to understand that walking and biking can be safe. To aid that experience, "block parents" and similar concepts can be employed to monitor child movements and reassure parents that their children will reach school and return home safely.

3. Fitness/Health – In coordination with officials from Mosaic Life-Care, the physical condition of the Nation, State, and local community population has been brought to the forefront. Increasingly, preventable diseases related to obesity are growing at a rapid pace. Societal changes in attitude have created a population that subsists upon an unhealthy diet and an overall reduction in physical activity. While construction and maintenance of non-motorized facilities is important, it is of equal importance to encourage children (and adults) to use them. Stopping obesity driven health issues before they start is a critical goal of health professionals at Mosaic Life-Care, and should be for parents, school administrators, and the community.

    Habits and culture can be re-directed through various programs using national models that focus upon combinations of education of the student and parents, in-field activities, and a better diet. Of course, facilities to use must be available.

4. Assessment - Work in a methodical fashion to address sidewalk condition and needed repairs; fill-in gaps where sidewalks were not constructed and address unsafe pedestrian crossings. If parents or children perceive that it is unsafe to walk or bike, what could be done to alleviate or address the concern?

The Metropolitan Planning Organization has coordinated with each of the school districts and cities within the metro to make assessments and developed a plan for each community and school. Each school district has formally adopted the final plan, as well as each municipality within the metro area. Results of the individual plans have been incorporated into a consolidated plan to help neighborhoods, cities, and school districts work together to identify and eliminate obstacles to walking and biking to schools, whether institutional, facility safety, education, or perceived safety issues. The work should serve to focus a bright light upon what needs to be done, where, and how.


Safe Routes
to Schools
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WATHENA
KS
ELWOOD
KS
ST. JOSEPH
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Browning Lake
Missouri River
Slough
Legend
Interstate
US Highway
State Highway
Safe Routes to School
Elementary School
PK-8
Middle School
High School
K-12
Higher Education
1 inch = 4,000 feet
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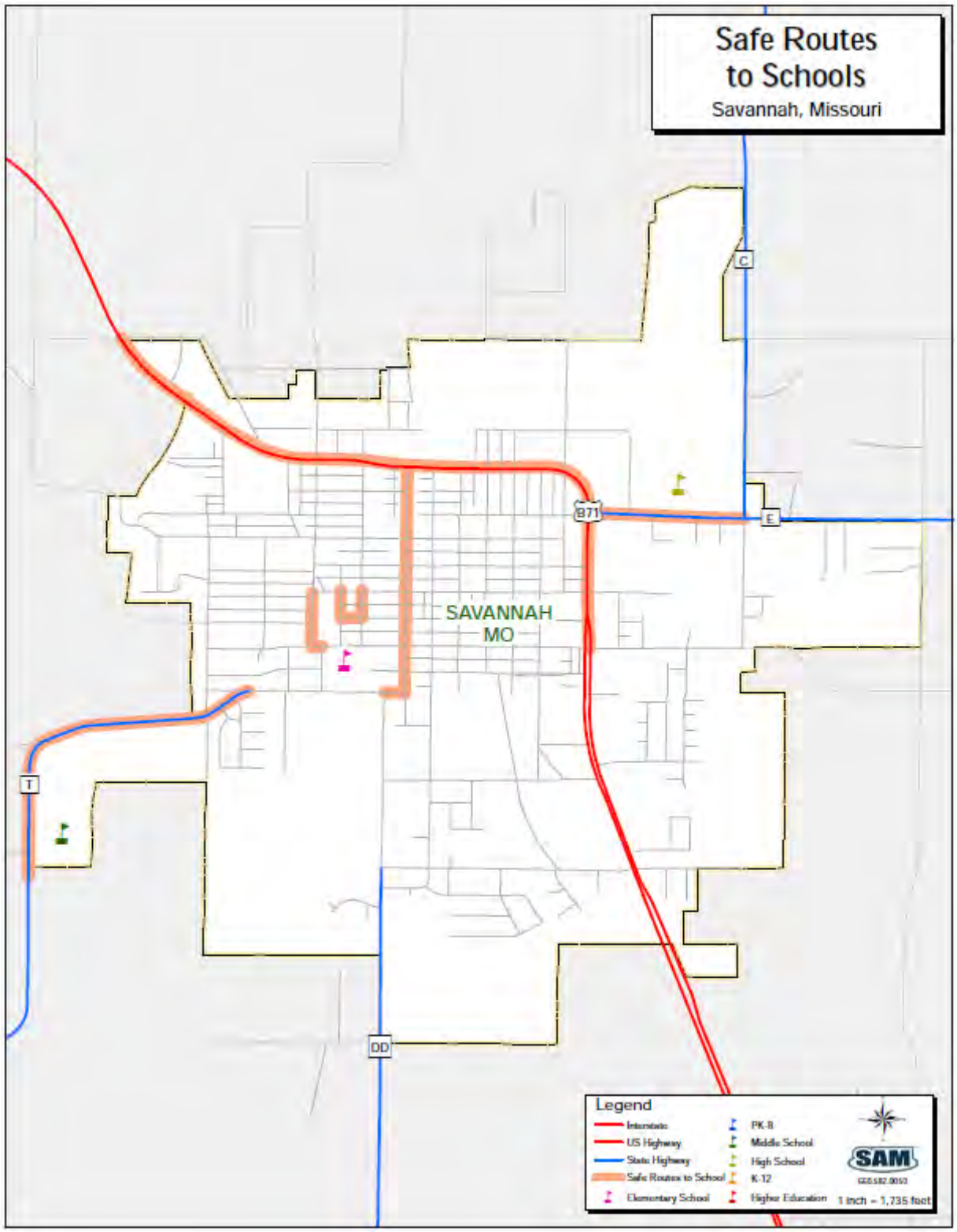
Safe Routes
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State Highway
Safe Routes to School
Elementary School
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Middle School
High School
K-12
Higher Education
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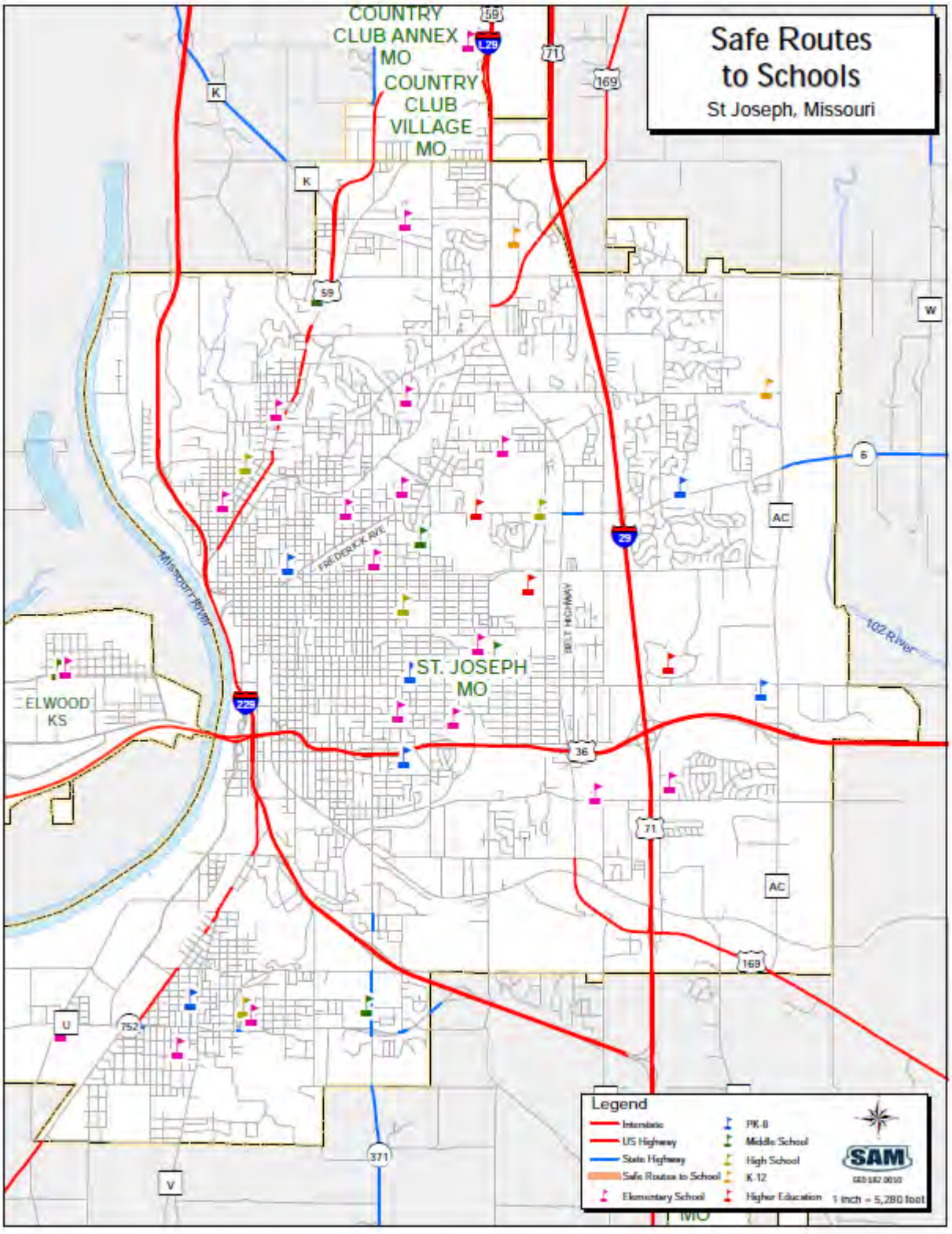
1 inch = 1,735 feet


Safe Routes
to Schools
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COUNTRY CLUB VILLAGE MO
ST. JOSEPH MO
ELWOOD KS
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Interstate
US Highway
State Highway
Safe Routes to School
Elementary School
PK-8
Middle School
High School
K-12
Higher Education
SAM
1 inch = 5,280 feet

HEALTH AND THE BUILT ENVIRONMENT
Is there a connection between facility design and health?

The number of overweight school-age children in the United States has increased more than 60 percent since 1988.

From 1980 to 2004, the rate of obesity doubled in the United States. Over the 2005–2006 period, more than a third of the U.S. population was obese, which translates into more than 72 million Americans struggling with significant weight problems, according to the National Center for Health Statistics.

According to "The Transportation Prescription Bold New Ideas for Healthy, Equitable Transportation Reform in America" by former Congressman James Oberstar, Chairman:

"Discussions of public health and wellness often are limited to the health and medical fields. It is my hope that soon, the transportation sector will be part of the discussion and play a role in providing solutions to improving the nation's overall health, well-being, and quality of life."

One of my goals as Chairman of the Committee on Transportation and Infrastructure is to create a new model for surface transportation, one that invests in alternative modes and promotes active, healthy lifestyles. Public health and transportation policy choices are inextricably linked. The transportation sector is responsible for one-third of the greenhouse gas emissions in the United States. Our infrastructure and land use choices often dictate our daily travel, and whether or not we have access to clean, healthy transportation options. And in any given year, approximately 40,000 Americans are killed on our roadways. The policy decisions we make regarding transportation have repercussions on public health throughout our society.

For too long now, our transportation decision-making has failed to address the impacts that our infrastructure network has on public health and equity. The asphalt poured and lane miles constructed enhanced our mobility and strengthened our economic growth; but too often, this auto-centric mindset took hold and crowded out opportunities to invest in a truly sustainable intermodal transportation system, in particular a system that meets the needs of underserved communities.

The failure to link transportation and land use decision making, and to consider the public health effects of these choices, has led to a tilted playing field that has made driving the easiest—and often the only—option available in many parts of the country. Our transportation policies and investments must do more to provide access for all through various modes. Transit, walking, and bicycling all have a significant role to play in lowering our dependence on foreign oil, reducing our greenhouse gas emissions and air pollutants, and helping Americans incorporate exercise and fresh air into their daily travel routines. We must also continue our pursuit to reduce the number—and rate—of traffic fatalities and injuries that occur each year.

Our most recent surface transportation legislation, enacted in 2005, took important steps toward building a healthier infrastructure by investing billions of dollars in safety, public transit,

walking, and bicycling. This legislation is helping to construct safer infrastructure, enable workforce development, build new transit lines, repair existing systems, and establish non-motorized transportation networks. We also enacted the Safe Routes to School program, which allows states to invest in safety improvements and education campaigns to get kids walking and biking to school again. This program has shown great early success and has the ability to change the habits of an entire generation.

Environmental sustainability, access, and our collective well-being must combine with mobility and safety as the cornerstones of our transportation investments. The following report represents an important contribution to our emerging understanding of the connections between transportation and public health and is an invaluable resource for policymakers and all those interested in building healthy communities. With a greater recognition of the strong linkage between public health and transportation, I believe we can build a network that supports our mobility and creates access and economic strength while promoting equity, sustaining our good health and quality of life.

Congressman James Oberstar
Former Chairman of the House Transportation and Infrastructure Committee

Introduction

Our transportation system has an enormous impact on our way of life, on the air we breathe, and on the vitality of our communities. Transportation choices influence personal decisions about where to live, shop, attend school, work, and enjoy leisure. They affect stress levels, family budgets, and the time we spend with our children. Although most people don't think of it as a determinant of health, our transportation system has far-reaching implications for our risk of disease and injury. Transportation policies and accompanying land use patterns contribute to the glaring health disparities between the affluent and the poor and between white people and people of color.

This report demonstrates that transportation policy is, in effect, health policy—and environmental policy, food policy, employment policy, and metropolitan development policy, each of which bears on health independently and in concert with the others. Longstanding transportation and land use policies are at odds with serious health, environmental, and economic needs of the country, and they have harmed low-income communities and communities of color especially. Forward thinking transportation policies must promote healthy, green, safe, accessible, and affordable ways of getting where we need to go. They also must go hand in hand with equitable, sustainable land use planning and community economic development.

Streets and roads are the largest chunks of property owned by most cities and states. We have choices to make about how to use, and share, that real estate. Who decides? Who benefits? Who pays? Transportation policy at all levels of government can be a vehicle to promote public health, sustainability, equitable opportunity, and the economic strength of neighborhoods, cities, and regions. But that will happen only if advocates, experts, and organizers steeped in all these issues bring their knowledge and passion to critical transportation decisions. The upcoming authorization of the most important transportation legislation in the United States, the federal

surface transportation bill, makes this a pivotal moment to bring a broad vision for health and equity to transportation policy. Underlying this report is a vision of transportation as more than a means to move people and goods, but also as a way to build healthy, opportunity-rich communities. Health is often viewed from an individual perspective. Yet, each resident in a region is both an individual and part of a larger community. Therefore, our vision for healthy, equitable communities is one that extends beyond individual outcomes and creates conditions that allow all to reach their full potential. It does not force us to balance one individual against another. It provides the opportunity for everyone to participate in their community, be healthy, and prosper.

A new framework for transportation policy and planning is emerging. Rather than focus almost exclusively on mobility (and its corollaries, speed and distance), this framework also emphasizes transportation accessibility. In other words, instead of designing transportation systems primarily to move cars and goods, the new approach calls for systems designed to serve people—all people—efficiently, affordably, and safely. This approach prioritizes investments in: (1) public transportation, walking, and bicycling—transportation modes that can promote health, opportunity, environmental quality, and indeed mobility for people who do not have access to cars; and (2) communities with the greatest need for affordable, safe, reliable transportation linkages to jobs, and essential goods and services—chiefly, low income communities and communities of color.

The goal is to improve transportation for everyone while delivering other important payoffs, including better respiratory and cardiovascular health; improved physical fitness; less emotional stress; cleaner air; quieter streets; fewer traffic injuries and deaths; and greater access to jobs, nutritious foods, pharmacies, clinics, and other essentials for healthy, productive living.

This new vision is at the core of a burgeoning movement to shape transportation policy to support work in a number of critical areas, such as climate change, sustainable agriculture, the prevention of chronic diseases, workforce development, and neighborhood revitalization. Advocates and experts in public health, environmental justice, labor, community economic development, food policy, and other fields and disciplines have important roles to play in transportation debates. A broad range of interests, working in partnership, can craft innovative, environmentally sound solutions that benefit everyone, rather than plans that reflect the motor vehicle orientation of road engineers and builders. Government transportation agencies and developers—the architects of our transportation systems for decades—must be held accountable for how their investments affect the economic prospects of regions, the health of communities, and the well-being of residents.

The push to reform transportation (along with its cousin, land use planning) has gained urgency in the face of three massive challenges that are upending the status quo of every field and that go to the heart of our love affair with the car: (1) climate change, with its threat of global ecological upheaval; (2) U.S. dependence on foreign oil, which carries grave risks for our economy and security; (3) a healthcare system crumbling under the demands of skyrocketing rates of diabetes and other chronic diseases associated with sedentary lifestyles, and astronomical costs. Transporting goods, services, and people accounts for about one-third of greenhouse gas emissions and two-thirds of petroleum consumption in the United States. As the National Surface

Transportation Policy and Revenue Study Commission noted in its landmark report, Transportation for Tomorrow, the environmental gains we achieve through incremental fixes such as higher fuel-efficiency standards, though important, will be trumped by increases in driving and traffic if we continue on our current policy course.

The good news is that change can happen, and inspiring examples abound. In the rural San Joaquin Valley in California, where public transportation has been virtually nonexistent, a new system of publicly managed vanpools is connecting farm worker families to jobs, schools, and medical services.

In Chicago's West Garfield Park, an alliance of residents, activists, and faith-based organizations not only successfully fought the closure of the rail line that linked the neighborhood to downtown; they also transformed a transit stop into an anchor development of shops, community services, and moderately priced housing.

In port cities around the country, many groups are working to reduce pollution from ships, locomotives, and trucks, some of the worst emitters of soot and greenhouse gases. In the Los Angeles region—one of a number of regions where the movement of goods represents a significant part of transportation investment and economic activity, and where ports and freeways abut low-income neighborhoods—the Coalition for Clean and Safe Ports has formed an effective alliance of residents, truck drivers, public health experts, environmentalists, environmental justice activists, unions, immigrant groups, and public officials to push for clean air solutions.

There is a deep and evolving knowledge base about the links between transportation and health. Research shows that when properly designed, transportation systems can provide exercise opportunities, improve safety, lower emotional stress, link poor people to opportunity, connect isolated older adults and people with disabilities to crucial services and social supports, and stimulate economic development. Conventional mobility focused planning by local, regional, and state transportation agencies generally overlooks or undervalues the impacts of transportation investments on health and equity.

Physical Activity

Sixty percent of adults in the United States do not meet recommended levels of physical activity, and 25 percent are completely sedentary (in Buchanan County, over 40% are sedentary). African Americans and Latinos are less likely than whites to get enough daily physical activity. The links between physical activity and health are well established. Sedentary lifestyles are estimated to contribute to as many as 255,000 deaths each year. Many children and teens are already at risk for heart disease and type 2 diabetes, once considered "adult" ailments. Today's youth may turn out to be the first generation in modern history to live shorter lives than their parents.

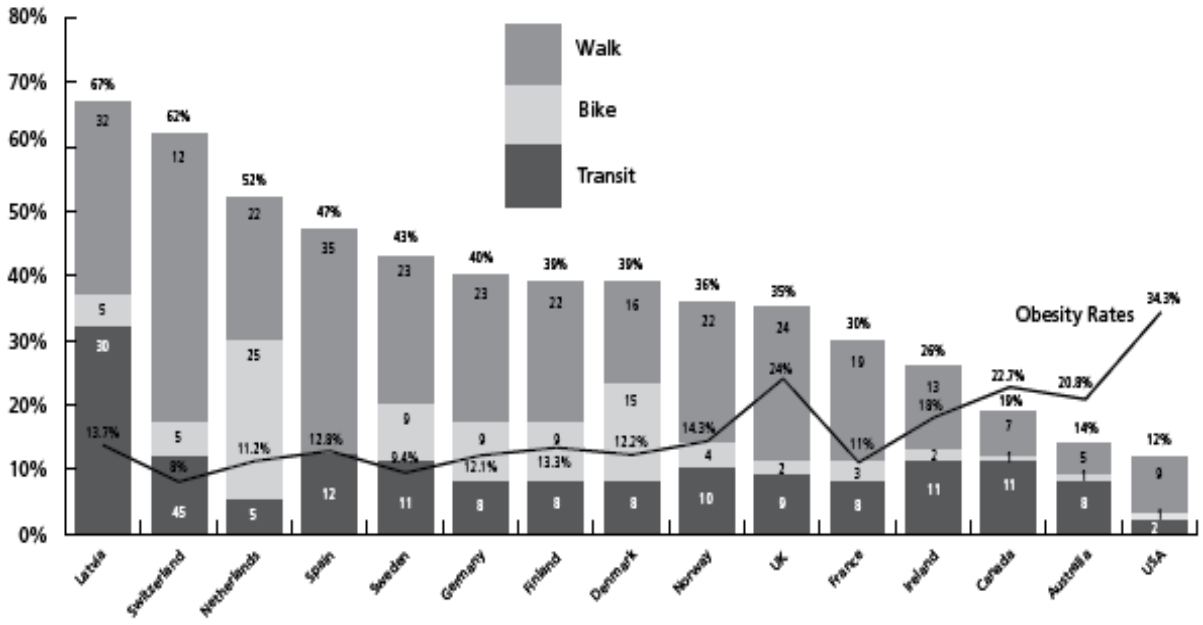
Physical inactivity is an important factor in the rising rates of obesity and chronic disease—and transportation practices strongly influence physical activity habits. The more time a person spends in a car, the more likely he or she is to be overweight. Conversely, higher rates of walking and bicycling are associated with lower rates of obesity. A 2004 study found that every

additional hour spent in a car is associated with a 6 percent increase in the likelihood of obesity, and every additional kilometer walked is associated with a 4.8 percent reduction.

There are many ways to be physically active, but quite a few require time, skill, and money. Walking and bicycling not only for recreation but also for transportation are the most practical ways to improve fitness. They are often the only viable option for low-income residents who live in neighborhoods without parks, who cannot afford gym memberships, and who do not have the luxury of leisure time.

People who use public transportation tend to walk to and from bus stops and train stations, increasing their likelihood of meeting physical activity recommendations. Residents of compact neighborhoods walk, bike, and use public transportation more than residents of spread-out communities, and they have lower rates of obesity.

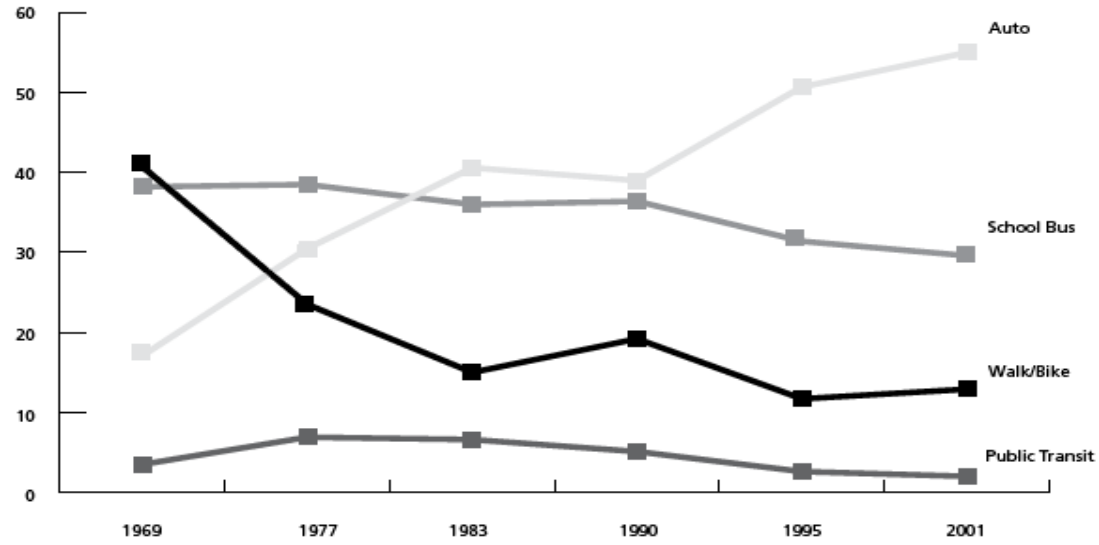
Figure 9. ***Mode Split vs. National Obesity Rates***[29]



This data set indicates that transportation mode split is highly variable, even among economically developed countries, and national obesity rates are inversely related to rates of active transportation (walking and bicycling).

Source: D. Bassett et al., "Walking, Cycling, and Obesity Rates in Europe, North America, and Australia," 2008.

Figure 5. ***Trends in Mode of Travel to School in United States, 1969–2001*** [24]



Source: N. C. McDonald, "Active Transportation to School," 2007.

Mental Health

Rush-hour gridlock, long waits for the bus, and arduous commutes are stressful. They take time away from family, friends, and the activities that provide emotional sustenance: hobbies, religion, sports, clubs, civic engagement, and volunteer commitments. Every 10 minutes spent commuting is associated with a 10 percent drop in the time spent traveling for social purposes. Many people find commuting by high-quality public transportation to be less stressful than commuting by car.

Safety

Traffic crashes are a leading cause of death and injury for Americans in the prime of life. In 2000, motor vehicle crashes cost $230.6 billion in medical costs, property damages, lost worker productivity, travel delays, and other expenses. That figure equals about half of all spending on public education from kindergarten through 12th grade.

Inequitable transportation policies and resources contribute to these disparities. Low income people and people of color have fewer resources to buy products that improve safety, such as late-model cars and new child safety seats. In under invested neighborhoods, poorly designed streets, neglected road maintenance, inadequate lighting, limited sidewalks, and minimal traffic enforcement place residents at higher risk of injury.

Safety is also a huge concern for older adults—the fastest-growing segment of the population—and for rural residents. Driving skills decline with age, and frailty makes older adults especially vulnerable in a collision. They are more likely to be killed or injured in a crash of a given

severity than any other age group. Older adults also walk slower and are more susceptible to pedestrian injuries.

Although less than a quarter of all driving in the United States takes place in rural settings, more than half of all motor vehicle crashes occur there.

The more we drive, the more likely we are to get hurt or die in a crash; there is a strong positive relationship between per capita vehicle miles traveled and traffic casualty rates. Communities with high annual mileage tend to have higher traffic death rates than communities where people drive less. Passengers on buses, light rail, and commuter rail have about one tenth the traffic death rate as people in cars. Investments in public transportation and walking and bicycling infrastructure can reduce injuries and deaths. Contrary to popular belief that more walkers and cyclists lead to more casualties, greater numbers of walkers and bicyclists actually decrease the risks.

Pollution

Pollutants from cars, buses, and trucks are associated with impaired lung development and function in infants and children, and with lung cancer, heart disease, respiratory illness, and premature death. Long-term exposure to pollution from traffic may be as significant a threat for premature death as traffic crashes and obesity. In California alone, pollution is a factor in an estimated 8,800 premature deaths a year.

Climate Change

Green house gas's (GHG) are not pollutants in the classical sense. They cause the atmospheric changes and resulting climate disruptions that are projected to alter the natural and built environments on which society relies. The health risks come largely from those environmental alterations. In a major shift in federal policy, the Environmental Protection Agency in April 2009 adopted the position that greenhouse gases pose a danger to human health and welfare. A few weeks later, the Climate Change and Health Protection and Promotion Act, H.R. 2323, was introduced in the House of Representatives. The bill would direct the Department of Health and Human Services to develop a national strategic action plan to prepare for and respond to the health effects of climate change.

Indirect Health Effects

Transportation is a lifeline. We depend on it to get to work, school, the doctor's office, the bank, the supermarket, the gym, or a friend's house. People without reliable, efficient, affordable ways to get around are cut off from jobs, social connections, and essential services. Access to transportation, to economic and social opportunity, and to resources for healthy living are inextricably linked. Gaps in all three areas feed on one another in complex ways. Policy reforms that put health equity objectives at the center of transportation planning and funding decisions can reduce these inequities.

Transportation, Income, and Health

As housing and jobs have moved farther apart, the distance has created employment barriers for anyone without unlimited ability to drive. 19.0 percent of African Americans and 13.7 percent of Latinos lack access to automobiles, compared with 4.6 percent of whites. Poverty complicates

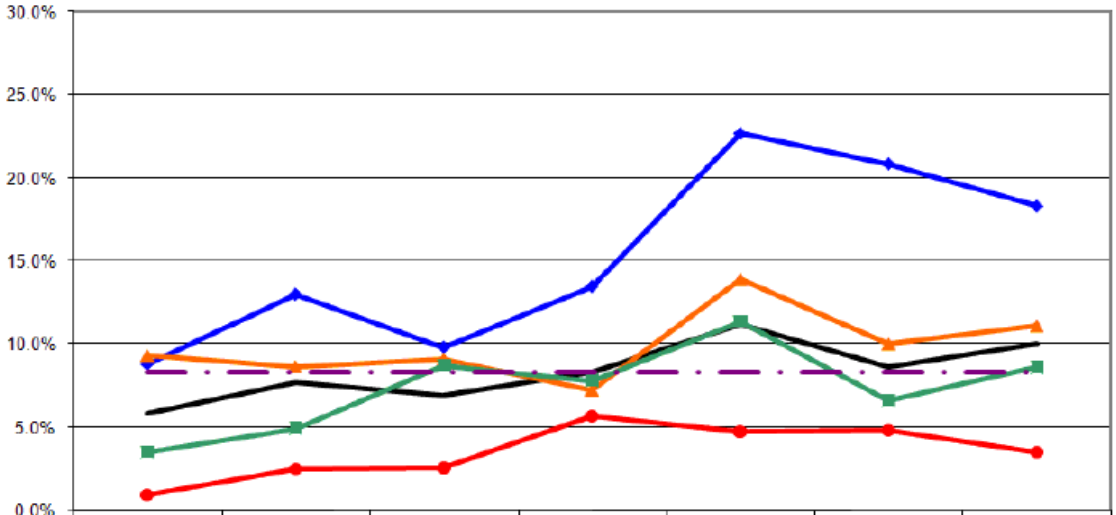
the problem: 33 percent of poor African Americans and 25 percent of poor Latinos lack automobile access, compared with 12.1 percent of poor whites. Cars owned by low-income people tend to be older, less reliable, and less fuel-efficient. This makes commuting to work unpredictable and more expensive, at best.

Income is an important determinant of health. The association between poverty and poor health is well documented. Jobs with good wages, including those in the transportation sector, are essential to sustaining health.

Transportation impacts not only family earnings but also expenses. The cost of getting around takes a significant bite out of household budgets. The general standard holds that a family should spend no more than 20 percent of income on transportation, or the costs will eat into other necessities, such as nutritious foods, and medical care. The average family in the United States spends about 18 percent of after-tax income on transportation, but this varies significantly by income and geography. For example, low-wage households (earning $20,000 to $35,000) living far from employment centers spend 37 percent of their incomes on transportation. In neighborhoods well served by public transportation, families spend an average of nine percent.

Buchanan County 2019

Diabetes Rates By Income



	1997	1999	2001	2003	2005	2007	2009
Total	5.8%	7.7%	6.9%	8.3%	11.2%	8.6%	10.0%
<$15K	8.8%	13.0%	9.8%	13.5%	22.7%	20.8%	18.3%
$15-25K	9.3%	8.6%	9.1%	7.2%	13.9%	10.0%	11.1%
$25-50K	3.5%	5.0%	8.7%	7.8%	11.3%	6.6%	8.8%
$50K+	1.0%	2.5%	2.6%	5.7%	4.8%	4.8%	3.5%
US Total Rate*							8.3%

*Source: 2008 CDC BRFSS

Older Americans and People with Disabilities

More than one in five Americans ages 65 and older do not drive because of poor health or eyesight, limited physical or mental abilities, concerns about safety, or because they have no car. More than half of non-drivers, or 3.6 million Americans, stay home on any given day—and more than half of that group, or 1.9 million, have disabilities. Isolation is especially acute in rural

communities, sprawling suburbs, and black and Latino communities. Compared with older drivers, older non-drivers take 15 percent fewer trips to the doctor; 59 percent fewer trips to shops and restaurants; and 65 percent fewer trips for family, social, and religious activities.

When affordable, high-quality public transportation and safe, walkable streets are available, older adults take advantage of them. More than half of older adults make walking a regular activity. More than half of older non-drivers in dense communities use public transportation at least occasionally, compared with one in 20 in spread-out communities.

The Americans with Disabilities Act (ADA) of 1990 significantly expanded transportation options for people with disabilities. ADA required public bus and rail operators to provide accommodations, such as lifts and ramps, to enable people in wheelchairs to ride. But street design in most communities makes traveling to and from bus stops challenging—and often unsafe—for people with disabilities. Paratransit systems, which use vans or shared taxis to transport people door-to-door, are helpful, but many systems are stretched thin and require appointments well in advance.

What Does Healthy, Equitable Transportation Policy Look Like?
Healthy, equitable, transportation policy supports the development of accessible, efficient, affordable, and safe alternatives to car travel, and especially to driving solo. These alternatives enable everyone to walk more, travel by bicycle, and use public transportation more—in other words, to get around in ways that improve health, expand access to opportunity, and reduce toxic pollutants and greenhouse gas emissions.

Healthy, equitable transportation policy is forged and implemented in concert with sustainable land use planning. Together, they encourage and support high-density, mixed use, mixed-income metropolitan development and affordable housing with good access to transportation options.

This report draws on the book, Healthy, Equitable Transportation Policies: Recommendations and Research commissioned by the Convergence Partnership, a collaborative of funders. The book describes innovative transportation and land use policies, strategies, and programs built on a foundation of equity and sustainability. The book is available online at www.convergencepartnership.org/ Healthy Equitable Transport.

Options included the following:
Numerous economic, social, and environmental benefits can result from public transportation improvements. Among them: reduced traffic crashes, improved physical fitness and health, energy conservation, reduced pollution emissions, increased community livability, increased affordability, consumer savings, economic development, and expanded opportunity.
It contends that improving public transportation is one of the most cost-effective ways to improve public health, and better health is one of the most significant potential benefits of public transportation improvements.

Increasing walking and bicycling while assuring safety, particularly for low-income families, children, and older adults, is an important goal for federal transportation policy. Walking and bicycling, or “active travel,” are low-cost, physically active, and environmentally clean

alternatives to driving, yet they represent fewer than 10 percent of all trips in the United States. In addition to expanding specialized programs for active travel, the federal government should assist, enable, encourage, and, in some instances, require state, regional, and local governments to address pedestrian and bicycling needs.

Federal transportation policy can and should address economic development, particularly in communities left behind by decades of transportation planning that favored car travel and encouraged sprawl. Targeted transportation investment can promote economic opportunity and reduce health disparities by (1) improving transportation linkages between housing and employment hubs and between residential neighborhoods and clinics, pharmacies, and grocery stores; (2) encouraging affordable, high-density, mixed-use transit oriented development; and (3) creating workforce strategies to ensure that jobs in the large, growing transportation sector are open to all, including minority and women workers and contractors.

Federal transportation policy should seek to increase access to healthy foods. Today's transportation networks make large quantities of foods from around the nation and the globe readily available for many Americans, but industrialized agriculture and the concentrated structure of food retail have negative health and environmental consequences for low-income communities, especially people of color, inner-city and rural residents, and immigrant farm workers. For example, urban and rural communities often have fewer and smaller supermarkets than suburban communities (if they have any at all) as well as more limited selections of healthy foods. As a result, residents eat fewer fruits and vegetables and have higher rates of diet-related illnesses. In addition, long distance food hauling has a disproportionate impact on the air quality and noise levels in poor and minority communities along freight routes. Although food access falls outside the traditional realm of transportation policy, improved public transportation, transit-oriented development, and cleaner methods to move freight can increase access to healthy foods in underserved communities, reduce air and noise pollution, and foster local, sustainable agri-food systems.

Transportation policy must make safety for all travelers a priority. Traffic crashes rank as the leading cause of death for people ages one to 34 and contribute to unnecessary human, social, and economic costs. Resources should be directed to communities with the least infrastructure to support safe walking, bicycling, and public transportation use and continue to support effective vehicle safety and occupant protection strategies. Traffic safety is an important strategy not only to reduce injuries and death but also to encourage physical activity, improve air quality, and increase transportation accessibility.

Source: The Transportation Prescription bold new ideas for healthy, equitable transportation return in America. Stjoehealthinfo.org (St Joseph Health Status 2019)

MICROMOBILITY
Bridging the first and last mile

"Micromobility" is quickly becoming a term of art rather than a strict definition of technology. At this time, it refers to small, lightweight devices that operate under 15 MPH and are used for trips of up to six miles. The devices themselves include a list of options that had formally been termed "non-motorized", including bicycles, Ebikes, electric scooters, electric skateboards, shared bicycles, and pedal assisted bicycles.

As the technology applied to devices continues to develop and evolve, perhaps the more meaningful determinant is the lack of an internal combustion engine powering motion versus human power or electric motor power.

The modern movement in the regulation of the new technology platforms generally began in the United States in Seattle, Washington, while Austin, Texas is credited with the first organized fleet of electric scooter deployment, followed by many others.

The rapid adoption and use of shared E-scooters has been adopted by users in many urbanized areas, generating a utilization rate of 4% in a single year. As a comparison, adoption rates have exceeded ride-sharing application services such as Lyft and Uber in early rollout phases.

As a result of the adoption of the scooter platform, conflicts have arisen in many cities between pedestrians, motorists, and traditional cyclists. Some cities have banned the use of scooters on sidewalks (bicycles have long been banned on sidewalks for the better part of 100 years in most cities) because of numerous injuries between operator and pedestrian. Other communities have been reluctant to sanction the use of scooters on streets or in separated or marked bike lines. However, the trend is moving toward allowing personal transportation platforms to be operated on the street as a legal vehicle, much like bicycles.

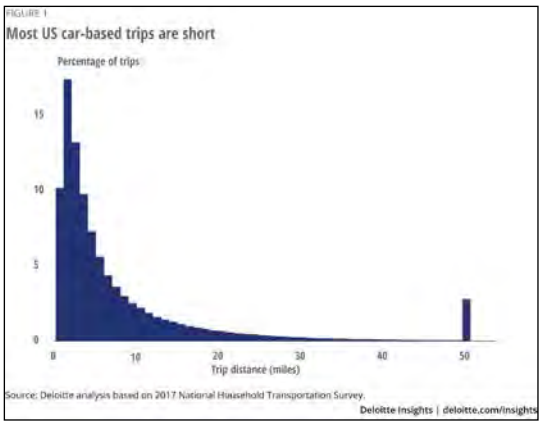
While scooters are grabbing the attention, other referenced platform technology is surging as well, particularly in the Ebike and pedal assist bicycle arena. Assisted propulsion appears to be the game changer.

Regardless of the method of propulsion, the market and adoption of personalized transportation options is here to stay. The form and application of the platforms and technology use for access will certainly continue to evolve until the needs of the market are met and user needs fulfilled. Like most technology, both consumer needs and technological advance will ensure that the larger subject area will continue to grow and evolve at a rapid pace for the foreseeable future.

Cities are responsible for the regulation of appropriate safety measures to assure that all modes of transportation are managed appropriately to assure that the needs of its community are met. Rather than delve into the details of what policies and procedures should be considered in regulating micromobility, this plan is focused upon the mechanics of folding the concept into the existing transportation framework.

First – Last Mile

As noted in the 2017 National Household Transportation Survey, 48% of the population commutes five miles or less to work. 41% of all car trips are within two miles of home and 17% of all car trips are within one mile of home.



Public transportation systems are typically very efficient at providing service on pre-determined routes but become less so when deviating to distinct locations in neighborhoods. Transit planners have long recognized the challenge represented by bridging the gap between the first and last mile, or connecting the transit line to specific locations that are not located within a close proximity of the route – whether that is a work place or residence.

The *last mile* gap can be met even more realistically now that the nexus between technology and traditional non-motorized modes have begun to merge – or the lines between the two blurs.

In St. Joseph and Elwood, public transit service includes both a fixed-route, timed element as well as a deviation service (deviation only in Elwood). It is realistic that some form of service coordination with third-party operators of micromobility services may be feasible to meet customer need. This service could be point to point (i.e. directly from a business to a shopping location) or intermodal connections between transit and other destinations.

In smaller urbanized areas the rollout of micromobility service has been largely ignored in favor of large fleet deployments in larger population centers. From a business perspective this makes sense when considering economies of scale, volume, and larger concentrations of origins/destinations in the central business districts (the bread and butter of most public transportation). The majority of urbanized service has been private, regulated by the local jurisdictions to address issues of parity, data collection, and level of service.

However, the cost of service is high (continual technology upgrades, equipment replacement cycles of 12 months, vandalism, logistical re-positioning, maintenance, and repair) and few if any of the private services are profitable at this juncture. If transit systems were open to the application of public private partnerships (P3), the threshold may be easier to meet for both enhanced mobility in smaller urbanized areas and service expansion. In such an arrangement, it may be more attractive to a private micromobility platform provider to venture out into a smaller market, such as the St. Joseph region.

Limitations – Not the Panacea

While micromobility platform partnerships could offer a new solution toward bridging the first and last mile in transit service, it will always compliment service, not represent a replacement for it. Such a statement is a provocative one but is based upon real-world transportation needs.

For example, many transit riders work with cognitive, physical disabilities or medical conditions and simply do not have the ability to access private transportation options. Trip length for others would be outside a reasonable range with existing technology. Other factors such as climate and weather would impact the attractiveness for some users. The Americans with Disabilities Act, Environmental Justice, and Title VI compliance would essentially preserve the right of protected classes to access the only service available to support their individual transportation needs. Other riders may simply prefer the climate control comfort of public transit.

Finally, the lack of an integrated and cohesive, non-motorized infrastructure being developed, and in-place, will limit the access to and through the community no matter what specific technological platform is developed and accessed. This gap in access may be the principal impediment to attract corporate interest in St. Joseph service expansion – and ultimately adoption by the local community.

To use a historical analogy, the modern expansion of motorized vehicles did not pre-date the development of the existing highway and interstate system. Trucks and cars operating through the 1940's, but they operated on roadway systems that had been expanded from the roadways developed earlier to support wagons. Interstates were developed to connect the nation, beginning in the 1950's. For decades, the running joke on recently completed interstates was that the investment was a boondoggle as few motorists were using them. In the 1970's, as households began to purchase more than the single car, daily traffic increased exponentially and interstates experienced congestion. Land use patterns changed too as a result of a more mobile workforce, as illustrated by the expansion of suburbs, and the environment that was created surrounds the nation to this day.

Given this example, and the rapid rate of new platform adoption, it would seem appropriate to make the same investments to support micromobility expansion and transit integration as the decision-making applied nearly 70 years ago did for motor vehicles operating today.

While changes in technology and societal acceptance of new transportation platforms and corporate interest to provide service will continue to expand and improve, space has to be created to safely allow operators to travel. The exciting aspect of micromobility is that there is even more pressure to apply existing planning practice and principals to the design of neighborhoods and the transportation system to support safe and effective access.

To do so, cities should embrace modal neutrality. This means accepting that if micromobility furthers a city's goals by improving congestion, complementing public transportation, and reducing individuals' carbon footprints, it should be welcomed—even if such services were introduced without consultation and with minimal direction from city leaders. It could behoove cities to not let initial experiences with micromobility overly color ongoing responses to what could be an important contributor to the city's mobility options. To that end, as a municipality ponders new rules for micromobility, one helpful check for officials might be to pose: Would such a rule ever be applied to cars? Per-trip fees, automatically enforced speed governors on vehicles, caps on total fleet size, and the public space devoted to each mode are all worth considering through the lens of car usage. Even if city leaders have good reasons for ultimately

rejecting the comparison, going through the exercise can help policymakers address micromobility providers' complaint of a double standard applied to e-scooters and automobiles.

Providers should be proactive in addressing city concerns. This can range from providing helmets and locks to increase safety and reduce vandalism, increasing education of riders, to using technology or measures to deter undesirable behavior, such as sidewalk riding. In almost every instance, a fundamental building block could be ensuring that city leaders have the data necessary to make informed policy. Providers should collaborate with officials to determine the appropriate technical standards, APIs, and types of data to be shared.

Providers should work to ensure that their services further city goals and to demonstrate their value to the overall transportation network. This could start with early and frequent dialogue with city leaders to better understand where their transportation pain points are. Providers can then fine-tune the where, when, and how of their micromobility deployments to help address the city's priorities, whether that's reducing congestion, solving the first-mile/last-mile problem, improving air quality, or increasing access for underserved communities. They should also be sensitive to city concerns about creating dependencies on private sector providers. As mobility investor Reilly Brennan observed, cities are rightly hesitant to anchor their transportation system around services that could be unilaterally shut down should business needs change. In the end, providers can benefit from the trust they build with local leaders and residents.

Manufacturers use a *whole project wheel* to examine how a core product goods and services work together in delivering a marketable product. The product wheel graphic revolves around scooters and product goals. This example focuses upon the ability to satisfy short trips, provide access to transit and design for safety. For shared scooters to succeed, there is a collection of elements required to create a sustainable service model.

The current trend is toward companies offering multiple types of vehicles. Uber and Lyft are investing in fleets of scooters and Ebikes, while some companies are promoting their own shared-use programs. Any organization, including transit agencies, a university, or advocacy group could build and manage its own scooter fleet. Some estimates suggest annual revenue from electric scooters to reach nearly $40 billion by 2025. In the end, the emphasis within micro-mobility will involve a migration toward the concepts represented in micro-transit where attention will be placed on trip planning. Under such an approach, the future lies in assisting the public with the means a user can access for mobility, not only the specific vehicle in a specific fleet: shared mobility platforms.

The first step in this process will require the MPO to develop a formal micromobility plan. The plan will not be a facilities plan, although facilities are important to feasibly support the mode. It will look more like a business plan that outlines the respective roles of transit-micromobility operator relationship, including financial/funding elements, data sharing, service coverage, and integration throughout the community. This plan should be initiated as a high priority. The micromobility plan should be appropriately integrated into a microtransit plan as well.

ASSESSMENT
MEASURING WALKABILITY

Good planning includes an element that assesses facilities. Such an approach ensures an on-going process of evaluation, assists in setting priorities, and helps examine the success of past projects in meeting the goals of a program.

To assess what improvements might be needed and where, it is necessary to apply methods of evaluating the system at various scales. As with transportation modeling, a macro evaluation would result in general information at the corridor level, while a micro level examination of neighborhoods within a corridor would provide very specific results.

Pedestrian system evaluation requires much more consideration than a simple report that says "replace the panel at station X". Instead, a *level of service* is a more appropriate measure in that it can include many factors that influence and support pedestrian use, as follows:

1. *Directness* – does the network provide the shortest route possible?
2. *Continuity* – is the network free from gaps and barriers?
3. *Street Crossings* – can the pedestrian safely cross streets?
4. *Visual Interest and Amenities* – is the environment attractive and comfortable?
5. *Security* – is the environment secure and well lighted with good line of sight to see the pedestrian?

A minimum standard for a given area or development type is different, based upon land use.

Pedestrian Level of Service Requirements By Pedestrian Area Type					
Area Type	**Directness**	**Continuity**	**Street Crossings**	**Visual Interest & Amenity**	**Security**
Pedestrian Zones	**A**	**A**	**B**	**B**	**B**
Mixed Use & Transit Zones	**A**	**B**	**B**	**B**	**B**
Neighborhood Activity Centers & Corridors	**B**	**B**	**C**	**B**	**B**
Schools/Parks	**C**	**B**	**B**	**C**	**B**
Walking To/From Transit	**B**	**C**	**C**	**C**	**B**
Other Areas	**C**	**C**	**C**	**C**	**C**

SJATSO Pedestrian Levels of Service Table

Measurement	A	B	C	D	E
Directness	Pedestrian has a direct, clear, understandable linear public path to destination, generally with more than one alternative route. (A/M Ration<1.2)*	Pedestrian has at least one direct, clear, understandable linear public path to destination with only minor deviations (A/M Ratio 1.2 to 1.4)*	Minimum acceptable directness and connectivity standard; path to destination lacks linearity, and is less clear and understandable (A/M Ratio 1.4 to 1.6)*	Increasing lack of directness, connectivity and linearity with incoherent and confusing direction and visual connection to pedestrian destinations. (A/M Ratio 1.6 to 2)*	No directness or connectivity. Total pedestrian disorientation, no linearity and confusing. (A/M Ratio>2.0)*
Continuity	ADA accessible Pedestrian sidewalk in good condition with landscaped parkway appears as a single entity connected to and within a major activity area or public open space.	Continuous stretches of ADA accessible sidewalks in generally good condition (10% or less need maintenance) that are physically separated by a landscaped parkway.	Continuous stretches of sidewalks that have variable widths, with and without landscaped parkways; maintenance problems occur in less than 20% of sidewalk.	Pedestrian corridors are not well connected with several breaches or barriers in the pedestrian network; maintenance needed over 50% of sidewalk.	Complete breakdown in pedestrian traffic flow as each pedestrian selects a different route, as no pedestrian network exists.
Street Crossings: Signalized**	3 or fewer lanes to cross or 4 or 5 lanes to cross with raised pedestrian refuge median and/or reduced lane widths or slower traffic speeds; total crossing width no greater than 72 feet. Signal has clear vehicular and pedestrian indications; Well marked crosswalks; Good lighting levels; Standard curb ramps; maximum curb radii in Pedestrian Areas *** of 20 feet. Automatic pedestrian signal phase; Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other.	4 or 5 to cross or 6 or more lanes to cross with raised pedestrian refuge median and/or reduced lane widths or slower traffic speeds; total crossing width no greater than 84 feet. Signal has clear vehicular and pedestrian indications; Well marked crosswalks; Good lighting levels; Pedestrian refuge area; raised medians at least 6' wide with low plantings or features; Standard curb ramps; maximum curb radii in Pedestrian Areas *** of 20 feet. Automatic pedestrian signal phase; Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other. Missing 2 elements of A	6 or more lanes to cross; total crossing width no greater than 96 feet. Signal has clear vehicular and pedestrian indications; Well marked crosswalks; Good lighting levels; Pedestrian refuge area; raised medians at least 6' wide with low plantings or features; Standard curb ramps; maximum curb radii in Pedestrian Areas *** of 20 feet. Automatic pedestrian signal phase; Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other. Missing 4 elements of A Missing 2 elements of B	Missing 5-6 elements of A Missing 4-5 elements of B Missing 2-3 elements of C	Missing 7 elements of A Missing 6 elements of B Missing 5 elements of C
Street Crossings: Unsignalized, Crossing the Major Street***	3 or fewer lanes to cross or 4 or 5 lanes to cross with raised pedestrian refuge median and/or reduced lane widths or slower traffic speeds; total crossing width no greater than 72 feet. Well marked crosswalks; Good lighting levels; Standard curb ramps; maximum curb radii in Pedestrian Areas *** of 20 feet. Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other.	4 or 5 to cross or 6 or more lanes to cross with raised pedestrian refuge median and/or reduced lane widths or slower traffic speeds; total crossing width no greater than 84 feet. Well marked crosswalks; Good lighting levels; Pedestrian refuge area; raised medians at least 6' wide with low plantings or features; Standard curb ramps; maximum curb radii in Pedestrian Areas *** of 20 feet. Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other.	6 or more lanes to cross; Well marked crosswalks; Good lighting levels; Pedestrian refuge area; raised medians at least 6' wide with low plantings or features; Standard curb ramps; maximum curb radii in Pedestrian Areas *** of 20 feet. Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other.	Missing 3-4 elements of A Missing 2-3 elements of B Missing 1-2 elements of C	Missing 5 elements of A Missing 4 elements of B Missing 3 elements of C

		Missing 1 element of A	Missing 2 elements of A Missing 1 element of B		
Street Crossings: Unsignalized, Crossing the Minor Street****	Well marked crosswalks; Good lighting levels; Standard curb ramps; maximum curb radii in Pedestrian Areas *** of 20 feet. Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other.	Missing 1 element of A	Missing 2 elements of A	Missing 3-4 elements of A	Missing 5 elements of A
Street Crossings: Mid-Block Major Street Crossing****	3 or fewer lanes to cross or 4 or 5 lanes to cross with raised pedestrian refuge median and/or reduced lane widths or slower traffic speeds; total crossing width no greater than 72 feet. Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other. Well marked crosswalks; Good lighting levels; Standard curb ramps.	4 or 5 lanes to cross with raised pedestrian refuge median and/or reduced lane widths or slower traffic speeds; total crossing width no greater than 84 feet. Raised median at least 10' wide with low plantings or features; Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other. Well marked crosswalks; Good lighting levels; Standard curb ramps. Missing 1 element of A	6 or more lanes to cross; Raised median at least 10' wide with low plantings or features; Amenities, signing, sidewalk, and roadway character strongly suggest the presence of pedestrian crossing; Drivers and pedestrians have unobstructed views of each other. Well marked crosswalks; Good lighting levels; Standard curb ramps. Missing 2 elements of A Missing 1 element of B	Missing 3-4 elements of A Missing 2-3 elements of B Missing 1-2 elements of C	Missing 5 elements of A Missing 4 elements of B Missing 3 elements of C
Visual Interest & Amenity	Visually appealing and compatible with local architecture. Generous sidewalk width, active building frontages. Good protection for elements by street trees or awnings; quality street furniture including frequent seating.	Generous sidewalks, visual clarity, some street furniture and landscaping, no blank street walls. Protection from elements available over 50% of block on average. Seating or resting places average once every 2 blocks.	Functionally operational with less importance to visual interest or amenity. Protection from elements available over 25% of block on average. Seating or resting places average once every 3 to 4 blocks.	Design ignores pedestrian with negative mental image. Protection from elements averages less than 10% of block. No seating or resting places within ¼ mile.	Total discomfort and intimidation. No protection from elements in multi-block area. No seating or resting places.
Security	Sense of security enhanced by presence of other people using sidewalks and being overlooked from adjacent buildings. Good pedestrian lighting on pedestrian routes and clear sight lines. Good separation from vehicular traffic by parkway with trees/planters	Good, if uneven, lighting levels on pedestrian routes and unobstructed lines of sight. Street edge of sidewalk separated from the street by at least 5 feet.	Generally good lighting levels on pedestrian routes with occasional short intervals of lower lighting; generally unobstructed lines of sight. Potential for separation from traffic of at least 5 feet.	Sidewalk configuration and parked cars may inhibit vigilance from the street. Separation from vehicular traffic available only at multi-block intervals.	Streetscape is pedestrian intolerant due to uses, building configurations, no protection from heavy traffic, no eyes on the street.

* A/M Ration: Actual distance between pedestrian origin/destination divided by minimum distance defined by a right angle grid street system.
** A signalized intersection LOS will go up one level of service with a dedicated pedestrian signal phase and/or a colored or textured crosswalk.
*** Pedestrian Areas are potential high pedestrian use areas based upon the SJATSO designations.
**** Unsignalized crossing at intersection of major street (minor arterial to major arterial) and minor street (local, connector and collector)

To highlight the purpose and methodology for evaluating pedestrian levels of service at the metro, municipal, neighborhood, and project level are as follows:

	Metro Area	Municipal	Neighborhood	Project
Purpose	Macro level assessment of walkability by area	General assessment of pedestrian system within a planning area	Neighborhood based needs assessment (what they most want)	Site specific assessment prior to construction
Directness	Presence of sidewalks through area	Fabric of the transportation system within the community (i.e. grid/ curvilinear and directness of connections to activity areas	Directness to where you want to walk to	Actual walk time compared to minimum walk time characterized by a grid
Continuity	Total length of sidewalks divided by length of streets	Character or theme of the pedestrian network (attached/detached, landscaping)	Completeness of pedestrian sidewalk system to get there.	Completeness of pedestrian system and integration with the project and surrounding uses.
Street Crossing	Number and size (lanes) of arterials within an area	Frequency of protected crosswalks and mid-block crossing	Major arterials that are difficult to cross	Number of lanes to cross plus pedestrian crossing features
Visual Interest & Amenity	City perspective of visually attractive areas from public input	General level of landscape/hardscaped, aesthetic design of corridors	Pedestrian scale, friendly	Presence of landscape/hardscape, parkways, medians, street lights
Security	Relationship between violent crime and population and employment density	Line of site to transit stops	Visual line of sight and street lighting	Visual line of sight and street lighting

SUMMARY
What it all means?

Good design does more than provide a facility for people already bicycling or walking; it encourages greater use of non-motorized transportation and generates a direct and positive impact upon the health of the population. Examples of facilities that encourage use are:

Bike lanes: By providing cyclists with their own space on the road, bike lanes improve access to destinations and commute options. Bike lanes on arterials:

- Establish the correct position of bicyclists on the roadway.
- Reduce bicycle/pedestrian conflicts as fewer cyclists ride on sidewalks.
- Provide bicyclists a space to travel at their own speed next to motorists.
- Guide bicyclists through intersections.
- Allow bicyclists to pass motor vehicles backed up at intersections (a bike lane is a legal travel lane); and
- Send a message to motorists that bicyclists have a right to the roadway.

Planting Strips: Sidewalks separated from the roadway with a planting strip create a pleasant environment for pedestrians. Besides creating a buffer from the noise and splash of moving vehicles, planting strips provide:

- Room for street furniture such as signs, utility and signal poles, mailboxes, parking meters, fire hydrants, etc.
- An opportunity for aesthetic enhancements such as landscaping and shade-producing trees, increasing the appeal of a roadway and pedestrians' sense of comfort; and
- A better environment for wheelchair users, as sidewalks can be kept at a constant grade without dipping at every driveway.

Bicyclists & Pedestrians: Similarities & Differences
Many early bikeway designs assumed that bicyclists resemble pedestrians in their behavior. This led to undesirable situations: inadequate facilities, pedestrians resent bicyclists in their space, and motorists are confused by bicyclists entering and leaving the traffic stream in unpredictable ways.

Only under special circumstances should designs allow bicyclists and pedestrians to share the same space, e.g. on multi-use paths.

The modes are similar in three ways:

- Location: Bicycle and pedestrian facilities, though separate from each other, are found at the roadway edge and often allocated insufficient space for their needs. This puts them close to the right-of-way line and in conflict with other demands such as parking, utility poles and signs. These situations create competition for this valuable space.
- Exposure: Pedestrians and bicyclists are exposed to the elements and are more vulnerable than motorists.
- Behavior: Pedestrians and bicyclists can be of any age and no license is required. Their actions and reactions change with age and are sometimes unpredictable.

Bicyclist Behavior
Bicycle riders are legitimate road users. They are, however, slower, less visible and more vulnerable than motorists. They need special treatment on busy, high-speed roads and at complex intersections. In congested urban areas, bicyclists can often proceed faster than motorists if well designed facilities are provided.

Bicyclists have certain unique characteristics: they are operating vehicles, yet they are exposed to the elements and use their own power; they don't like to interrupt their momentum; they are vulnerable in crashes; they must constantly maintain their balance; and they can interact socially with other bicyclists and pedestrians.

Well-designed bicycle facilities guide cyclists of various skill levels to ride on the roadway in a safe manner that conforms to the vehicle code. This is in the same direction as traffic, usually in a position 1 to 1.2 m (3 to 4 ft) from the edge of the roadway or parked cars, to avoid debris, drainage grates and other potential hazards. Bikeways should allow cyclists to proceed through intersections in a manner that is as direct, predictable, and safe as possible.

Pedestrian Behavior
Pedestrians prefer greater separation from traffic and are slower than bicyclists. They need extra time for crossing roadways, special consideration at intersections and traffic signals, and other improvements to enhance the walking environment.

Pedestrians are the most vulnerable of roadway users, as they are exposed to the weather and are often not visible to motorists. They are also the least tolerant of out-of-direction travel and will often take short cuts where there is no convenient or direct facility. Pedestrian facilities must be designed to meet or exceed the requirements of the ADAAG.

Some design details are important for their contribution to safety (e.g. pedestrian signals and illumination), some because they make walking more convenient (e.g. paths that provide short-cuts), and others because they make the walking experience more pleasant and minimize the sensory impact of adjacent motor vehicles (e.g. planting strips).

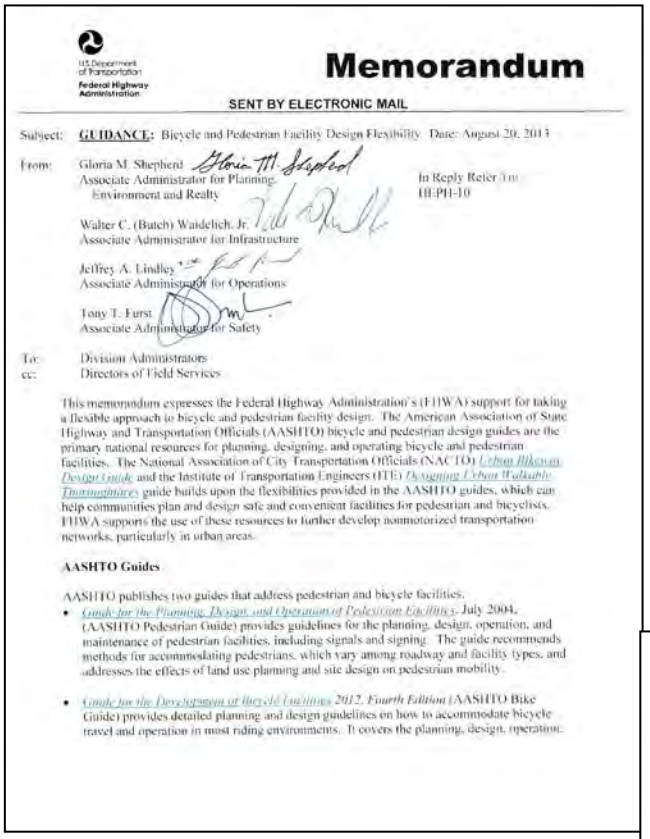
Standards & Minimums
Standards are developed to create conditions for users that are safe and comfortable under optimum conditions. Whenever possible and appropriate, facilities shall be built to standard.

There are situations where a standard cannot be maintained due to geometric, environmental or other constraints, or may not be appropriate, due to the nature of the surroundings or users. In these circumstances, a design using dimensions less than the standard may be acceptable; however, a facility should not be built to less than minimum standards.

There is always a range between the standard and the minimum, so intermediate values may be used. For example, the standard width for a sidewalk in a commercial area is 8 feet, with a minimum of 6 feet; sidewalks may also be 7 feet or 6 ½ feet wide, depending on circumstances.

Other Innovative Designs

There are many innovative designs that facilitate bicycling and walking that are not yet found in existing design manuals. Some designs enhance the roadway environment for bicyclists and pedestrians, such as contra-flow bike lanes, while others lessen the negative impacts of designs aimed at improving motor-vehicle flow, such as dual right-turn lanes. The FHWA has formally issued a memo in 2013 that allows for alternative design standards to be utilized and employed, aside from the traditional AASHTO standard. This change at the federal level essentially enables federally funded projects to be designed with the same flexible and innovative approach that non-federal projects can be designed with.



U.S. Department of Transportation
Federal Highway Administration

Memorandum

SENT BY ELECTRONIC MAIL

Subject: **GUIDANCE:** Bicycle and Pedestrian Facility Design Flexibility Date: August 20, 2013

From: Gloria M. Shepherd
Associate Administrator for Planning, Environment and Realty

In Reply Refer To: HEPH-10

Walter C. (Butch) Waidelich, Jr.
Associate Administrator for Infrastructure

Jeffrey A. Lindley
Associate Administrator for Operations

Tony T. Furst
Associate Administrator for Safety

To: Division Administrators
cc: Directors of Field Services

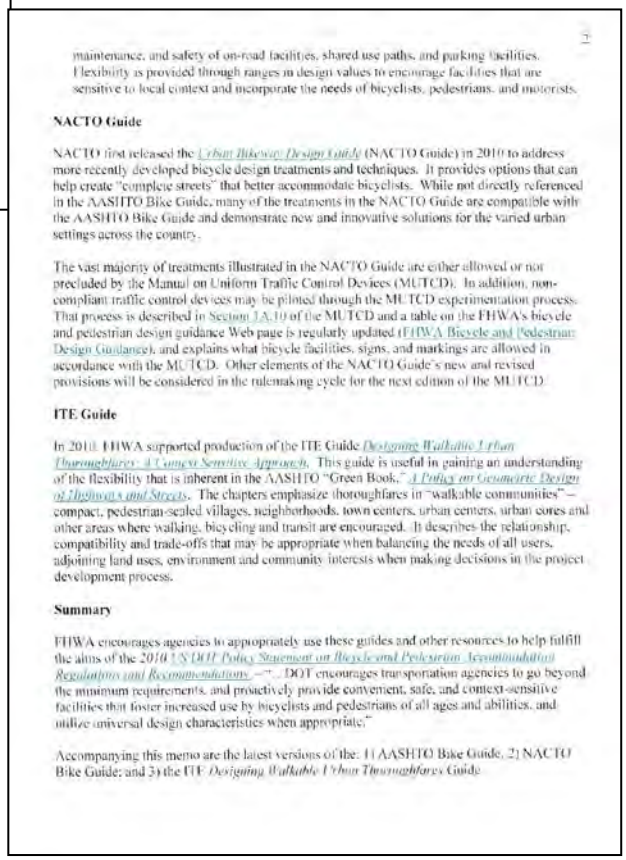
This memorandum expresses the Federal Highway Administration's (FHWA) support for taking a flexible approach to bicycle and pedestrian facility design. The American Association of State Highway and Transportation Officials (AASHTO) bicycle and pedestrian design guides are the primary national resources for planning, designing, and operating bicycle and pedestrian facilities. The National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* and the Institute of Transportation Engineers (ITE) *Designing Urban Walkable Thoroughfares* guide builds upon the flexibilities provided in the AASHTO guides, which can help communities plan and design safe and convenient facilities for pedestrian and bicyclists. FHWA supports the use of these resources to further develop nonmotorized transportation networks, particularly in urban areas.

AASHTO Guides

AASHTO publishes two guides that address pedestrian and bicycle facilities.

- *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, July 2004. (AASHTO Pedestrian Guide) provides guidelines for the planning, design, operation, and maintenance of pedestrian facilities, including signals and signing. The guide recommends methods for accommodating pedestrians, which vary among roadway and facility types, and addresses the effects of land use planning and site design on pedestrian mobility.
- *Guide for the Development of Bicycle Facilities 2012, Fourth Edition* (AASHTO Bike Guide) provides detailed planning and design guidelines on how to accommodate bicycle travel and operation in most riding environments. It covers the planning, design, operation,

As the state of the practice is evolving in these areas, new and innovative design alternatives are encouraged for evaluation and deployment. However, the term "innovative designs" shall not be defined as a deviation from the philosophical direction set forth in this document that focuses upon coordinated, context sensitive design principles for all modes of transportation.



maintenance, and safety of on-road facilities, shared use paths, and parking facilities. Flexibility is provided through ranges in design values to encourage facilities that are sensitive to local context and incorporate the needs of bicyclists, pedestrians, and motorists.

NACTO Guide

NACTO first released the *Urban Bikeway Design Guide* (NACTO Guide) in 2010 to address more recently developed bicycle design treatments and techniques. It provides options that can help create "complete streets" that better accommodate bicyclists. While not directly referenced in the AASHTO Bike Guide, many of the treatments in the NACTO Guide are compatible with the AASHTO Bike Guide and demonstrate new and innovative solutions for the varied urban settings across the country.

The vast majority of treatments illustrated in the NACTO Guide are either allowed or not precluded by the Manual on Uniform Traffic Control Devices (MUTCD). In addition, non-compliant traffic control devices may be piloted through the MUTCD experimentation process. That process is described in Section 3A.10 of the MUTCD and a table on the FHWA's bicycle and pedestrian design guidance Web page is regularly updated (FHWA Bicycle and Pedestrian Design Guidance), and explains what bicycle facilities, signs, and markings are allowed in accordance with the MUTCD. Other elements of the NACTO Guide's new and revised provisions will be considered in the rulemaking cycle for the next edition of the MUTCD.

ITE Guide

In 2010, FHWA supported production of the ITE Guide *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*. This guide is useful in gaining an understanding of the flexibility that is inherent in the AASHTO "Green Book," *A Policy on Geometric Design of Highways and Streets*. The chapters emphasize thoroughfares in "walkable communities" – compact, pedestrian-scaled villages, neighborhoods, town centers, urban centers, urban cores and other areas where walking, bicycling and transit are encouraged. It describes the relationship, compatibility and trade-offs that may be appropriate when balancing the needs of all users, adjoining land uses, environment and community interests when making decisions in the project development process.

Summary

FHWA encourages agencies to appropriately use these guides and other resources to help fulfill the aims of the *2010 USDOT Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations* – "...DOT encourages transportation agencies to go beyond the minimum requirements, and proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate."

Accompanying this memo are the latest versions of the: 1) AASHTO Bike Guide, 2) NACTO Bike Guide; and 3) the ITE *Designing Walkable Urban Thoroughfares* Guide.

SOURCES

This document relies heavily upon the philosophies and source materials contained within this section:

A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018. American Association of State Highway and Transportation Officials (AASHTO).

Bicycling in Traffic – Intermediate Bicycle Handling & Beginning/Intermediate Urban Traffic Skills, 1991. Diana Lewiston.

Design and Safety of Pedestrian Facilities, A Recommended Practice, 1998. Institute of Transportation Engineers.

Design Guidance – Accommodating Bicycle and Pedestrian Travel: A Recommended Approach, 2000. United States Department of Transportation.

Guide for the Development of Bicycle Facilities, 4th Edition, 2012. American Association of State and Highway Transportation Officials (AASHTO).

Manual on Uniform Traffic Control Devices, 2019. Federal Highway Administration.

National Strategies for Advancing Bicycle Safety, 2001. United States Department of Transportation.

Pedestrian and Bicyclist Standards and Innovations in Large Central Cities, 2006, Rudin Center for Transportation Policy & Management, New York University.

Planning and Implementing Pedestrian Facilities in Suburban and Developing Rural Areas, Transportation Research Board.

Street Design Guidelines for Healthy Neighborhoods, 2020, America Walks.

Bicycle and Pedestrian Design Guide, 2011. Oregon Department of Transportation.

SECOND REGULAR SESSION

House Concurrent Resolution No. 67

95TH GENERAL ASSEMBLY

INTRODUCED BY REPRESENTATIVES SUTHERLAND (Sponsor), WILSON (119), BURNETT, FAITH, FISCHER (107), SCHLOTTACH, SCHAAF, CUNNINGHAM, SILVEY, RUZICKA, TILLEY, LAMPE, HUGHES, MEADOWS, McDONALD, OXFORD, KIRKTON, LOW, SKAGGS, KRAUS, STREAM AND KUESSNER (Co-sponsors).

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Whereas, bicycling and walking are essential to millions of Missourians as basic transportation and enjoyed by millions of Missourians as healthful recreation; and

Whereas, encouraging and promoting a complete network of safe bicycle and pedestrian ways and routes is essential for those Missourians who rely on bicycling and walking for transportation; and

Whereas, a safe and complete bicycle and pedestrian system is important for Missouri's economy and economic development; and

Whereas, incorporating bicycle and pedestrian accommodations as a routine part of Missouri's road and street network is the most cost-effective way to make opportunities for safe walking and bicycling available to all Missourians and to enable those who bicycle and walk to reach all needed destinations; and

Whereas, walking and bicycling improve the public health and reduce treatment costs for conditions associated with reduced physical activity, including obesity, heart disease, lung disease, and diabetes; and

Whereas, the United Health Foundation estimates direct medical costs associated with physical inactivity in Missouri at $1.9 billion in 2008, and projects an annual cost for Missouri of over $8 billion per year by 2018 if current trends continue; and

Whereas, the annual per capita cost of obesity is $450 per Missourian, the highest per capita cost of any state in the United States; and

Whereas, designing our communities, our neighborhoods, our commercial centers, and our employment centers to be safe and inviting for bicycling and walking is a proven and recommended solution for increasing citizens' physical activity levels, improving physical fitness, reducing obesity, improving overall health, and so reducing health care and economic costs related to obesity and poor physical fitness; and

Whereas, promoting bicycling and walking for transportation improves Missouri's environment, reduces congestion, reduces the need for expensive expansion of our road and highway systems, and reduces our dependence on foreign energy supplies; and

Whereas, creating communities that invite and encourage bicycling and walking builds strong neighborhoods and encourages healthy, stable, safe, and livable communities; and

Whereas, creating healthy, walkable, bicyclable, and livable communities helps keep Missouri competitive in the global competition for high quality businesses and motivated, creative workers who consider transportation and recreation options an essential part of a healthy community; and

Whereas, Missourians who reach retirement age choose more often to bicycle and walk for fitness, recreation, enjoyment, and transportation; and

Whereas, citizens with disabilities often rely on bicycling, walking, and transit to meet basic transportation needs and to make connections with the transit system, face great obstacles within our current transportation system, and benefit greatly from complete and well-designed accommodations for bicycling and walking; and

Whereas, all transit users depend on bicycling and walking for essential transportation, and young people who develop stamina and fitness through regular active transportation reap important benefits in their physical, social, emotional, and intellectual development; and

Whereas, the number of Missouri students who bicycle and walk to school has dropped dramatically over the past forty years, with 50% of students bicycling or walking in 1975 but only 15% in 2005. In the same period, the percentage of children clinically defined as overweight has increased from 8% to 25%; and

Whereas, not only the health and physical fitness but also the mental health and overall independence and maturity of school-age children has suffered as a result of fewer children bicycling and walking regularly, and the conditions of our roads, streets, sidewalks, and intersections in failing to provide safe accommodations for bicycling and walking is in large part responsible for this change; and

Whereas, a lack of physical activity plays a leading role in rising rates of obesity, diabetes, and other health problems among children, and being able to bicycle or walk to school offers an opportunity to build healthy activity into the daily routine; and

Whereas, the Institute of Medicine reports that increasing opportunities for regular physical activity and supporting the efforts of families to incorporate physical activity into their lives are important strategies for reversing the childhood obesity epidemic; and

Whereas, 20-25% of morning rush hour traffic is attributable to parents driving their children to school; and

Whereas, over fifty Missouri organizations, agencies, schools, officials, and individuals have joined together to form the Missouri Safe Routes to School Network to encourage more children to safely bicycle and walk to school and to make streets, sidewalks, and communities safer and more inviting to children and families to bicycle and walk; and

Whereas, the usual and customary users of Missouri's roads, highways, and bridges include pedestrians, bicyclists, and transit passengers of all ages and abilities, as well as drivers and passengers of trucks, buses, and automobiles; and

Whereas, the term "Complete Streets" means creating roads, streets, and communities where all road users can feel safe, secure, and welcome on our roads and streets and throughout our communities; and

Whereas, the principles of Complete Streets are designed to create a transportation network that meets the needs of all users of the state's transportation system: pedestrians of all ages and abilities, bicyclists, disabled persons, public transportation vehicles and patrons, and those who travel in trucks, buses, and automobiles; and

Whereas, the terms "livable streets" and "comprehensive street design" are also used to identify these same concepts; and

Whereas, coordination and cooperation among many different agencies and municipalities is required to fully implement Complete Streets and create a complete, connected, and safe transportation network for bicycling and walking; and

Whereas, Complete Streets' policies require transportation planners and engineers to engage with a wide range of communities and stakeholders, build projects that meet the needs of all users of our transportation system, and design roads and bridges that complement and complete our communities and the human environment; and

Whereas, Complete Streets' policies enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods in rural, urban, and suburban areas; and

Whereas, Complete Streets' policies develop safe, reliable, and economic transportation choices to decrease household transportation costs, improve air quality, and promote public health; and

Whereas, Complete Streets policies are those that:

(1) Ensure that transportation projects provide for the needs of drivers, public transportation vehicles and patrons, bicyclists, and pedestrians of all ages and abilities in all planning, programming, design, construction, reconstruction, retrofit, operations, and maintenance activities and products;

(2) Provide for safety and contiguous routes for all road users;

(3) Ensure that bicycle ways and pedestrian ways, including sidewalks, crosswalks, paths, bicycle lanes, shoulders, shared use lanes, and all other facilities necessary for safe accommodation of bicycling and walking, shall be given full consideration in the planning, development, construction, and maintenance of transportation facilities;

(4) Reaffirm that pedestrians, disabled persons, bicyclists, users of public transit, and other nonmotorized users of public roadways are among the customary users of public roads and highways, except where specifically prohibited by law or regulation;

(5) Encourage the cooperation and coordination among agencies and municipalities to create safe, complete, integrated, and seamless system of routes for these users across borders and jurisdictions;

(6) Support routine and appropriate accommodation for bicyclists, pedestrians, disabled persons, and transit users on all transportation projects, as appropriate to the context, community, and project use, except:

(a) Where bicycling and walking are not allowed;

(b) Where sparsity of population or other factors indicate an absence of any need for such accommodations now or in the future;

(c) Where the cost of establishing such accommodations would be excessively disproportionate to the need or probable use:

Now, therefore, be it resolved that the members of the House of Representatives of the Ninety-fifth General Assembly, Second Regular Session, the Senate concurring therein, hereby declare our support for Complete Streets policies and urge their adoption at the local, metropolitan, regional, state, and national levels; and

Be it further resolved that the General Assembly encourages and urges the United States Department of Transportation, the Missouri Department of Transportation, the governing bodies of metropolitan planning organizations and regional planning commissions, municipalities, and other organizations and agencies that build, control, maintain, or fund roads, highways, and bridges in Missouri to adopt Complete Streets' policies and to plan, design, build, and maintain their road and street system to provide complete, safe access to all road users; and

Be it further resolved that the Chief Clerk of the Missouri House of Representatives be instructed to prepare properly inscribed copies of this resolution for Governor Jay Nixon; Ray LaHood, Secretary of the United States Department of Transportation; members of the Missouri Highways and Transportation Commission; Pete Rahn, Director of the Missouri Department of Transportation; the directors of each metropolitan planning agency and regional planning commission in the State of Missouri; and to the Missouri Municipal League.

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