APPENDIX C
Greater Kansas City Bikeways Plan

Implementation

Best practices and strategies

Peer MPO Interviews

Facility design standards

Effective Promotion and Marketing

Bike-ped counting recommendations

Maintenance of bikeways
MEMORANDUM

Date: April 11, 2014
To: Aaron Bartlett, MARC
From: Kevin Luecke & Tom Huber
Project: MARC Regional Bikeway Plan
Re: Task 1: Best Practices and Planning Strategies

The purpose of this memorandum is to identify the best practices which are strongly associated with a successful Metropolitan Planning Organization (MPO) bicycle and pedestrian program. An effective MPO program is inextricably tied to successful community bicycle programs within the MPO region they serve; therefore, this memo will also include strategies that communities within the MPO can follow to be successful. The five common traits of most successful bicycle programs are provided below and are followed by more specific best practices.

- Commitment to bicycling and walking
- A well-honed plan
- The ability to move plans into real practices
- An understanding of how funding works and a means to direct it to bicycle and pedestrian projects
- Public involvement and political support

Best Practices

The following are a variety of practices used by agencies to improve bicycling conditions and are considered to be either exemplary or exceptional, thus “best practices”. Not every one of these practices will automatically be a good fit for the Mid-America Regional Council (MARC) or for communities within the MPO planning area. In many cases, these practices are already being used. Communities and agencies within these areas can focus on the best practices are not in use or those that are the most timely to implement. The first set of best practices generally applies to communities and counties within the MPO, but in some cases are also valid for consideration by MARC. The second set of best practices that are outlined, are directed almost entirely at MARC.

For every best practice described, at least one example is provided. Whenever examples that were geographically close to the Kansas City metro area could be highlighted they were. In other cases, if exceptional practices were found to exist in other areas of the United States and it was believed that they portrayed a good practice for the Kansas City metro area, they were provided. The following approach was used to provide a summary of the best practices and examples:

- Toole Design Group staff members were interviewed to learn of overall best practices with a special emphasis on best practices in planning;
- Existing plans across the U.S. were reviewed and considered for recommendations - the Toole Design Group used its experience gained from producing over 100 community, county, MPO and state bicycle plans over the past 10 years;
- A search of MPO resources and reports was conducted; and
- Survey results from the MARC “report cards” were reviewed to identify locally derived best practices. (Note, this has not been compiled.)
Best Practices – Communities within MPOs

Planning
Most community and county efforts to improve bicycling conditions begin with a planning effort. Furthermore, all MPOs are required by federal transportation rules to address bicycling and walking in either a free-standing plan or as part of their long-range transportation plan. A plan does not necessarily guarantee a successful bicycle program, but it improves the chances that facets of the plan will be implemented. For local agencies it also improves the chances that state or federal funds will be invested in the actions recommended by the plan. This is especially true for the bicycle infrastructure (network plan) that is recommended in the plan.

Many of the plans are patterned after the five “E’s” of transportation – engineering, education, enforcement, encouragement, and evaluation. The principle behind this approach is that these five “E’s” tend to function together. For example, designing bicycle lanes without considering how bicyclists will be taught to use them will undermine the design and make them less safe for everyday use. Nevertheless, the emphasis of these plans almost always is directed at engineering and contains bicycle network maps. For example, the **Austin 2009 Bicycle Plan Update** ([http://www.pedbikeinfo.org/pdf/PlanDesign_SamplePlans_Local_Austin2009.pdf](http://www.pedbikeinfo.org/pdf/PlanDesign_SamplePlans_Local_Austin2009.pdf)) is a major update of their 15 year old plan and provides a set of comprehensive goals, objectives, and actions to be completed over a 10 year period that specifically addresses the five “E’s.”

Specialty plans are also becoming more common, and are often completed in addition to comprehensive bicycle plans. **Chicago Streets for Cycling Plan 2020** is an excellent example of a network plan focused on short and medium term recommendations. It has ten area plans that constitute a city-wide network plan which is focused towards on-street facilities. The plan provides a simple hierarchy of bikeways ranging from neighborhood routes to spoke and crosstown routes. It includes several case studies, as well as a concisely outlined implementation chapter. It is simple to follow and written in commonly understood language. Although this is a plan for a much larger city than exists as part of the MARC MPO area, its simplicity and focused area plans are good models for the smaller cities in the MPO.

For communities developing their own plans, or wanting to hire a consultant to help with the work, **Creating a Road Map for Producing & Implementing a Bicycle Master Plan** ([http://www.bikewalk.org/pdfs/BMP_RoadMap.pdf](http://www.bikewalk.org/pdfs/BMP_RoadMap.pdf)) offers a multi-step process and a complete planning approach. It contains an important chapter on the steps involved in putting the plan in action including how to get the plan adopted, establishing annual work plans, seizing opportunities for incorporating bicycle projects, etc.

Funding
One of the common metrics for measuring improvement for bicycling is bikeway development. Bikeway construction is primarily a factor of funding. One of the major changes in funding over the past 20 years has been the large increase in federal funding available for projects. Bikeways are funded either as integrated parts of larger street and highway projects or as separate or independent projects. MPOs usually have control over only a small portion of the federal transportation funds that are programmed through their planning process. This has recently changed. The new Federal Transportation Bill passed in July 2012—known as **Moving Ahead for People in the 21st Century** (MAP-21)—restructured and redefined eligibility for several federal funding programs for which bicycle and pedestrian projects are eligible. MARC is currently reviewing applications for three federal programs - Congestion Mitigation/Air Quality (CMAQ), Surface Transportation Program (STP), and Transportation Alternatives (TAP) (see Table 1). In the past, the majority of these funds have been awarded to traditional highway
projects. Even if funds are used to construct streets and highways, bikeways can be added as integrated parts of those projects. This approach is strongly recommended by federal policies and is consistent as a complete streets approach.

\textit{Table 1: CMAQ, STP and TAP funding}

<table>
<thead>
<tr>
<th>Program</th>
<th>Period</th>
<th>Total Anticipated Funding*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestion Mitigation/Air Quality (CMAQ)</td>
<td>2015 - 2018</td>
<td>$9.1 M</td>
</tr>
<tr>
<td>Surface Transportation Program (STP)</td>
<td>2017 - 2018</td>
<td>$24.0 M</td>
</tr>
<tr>
<td>Transportation Alternatives (TAP)</td>
<td>2014 - 2018</td>
<td>$6.1 M</td>
</tr>
</tbody>
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* Since the majority of these funding years are outside the extent of MAP-21, some uncertainty remains about the level of funding available for programming by MARC and these estimates are subject to change.

Nationwide, most federal transportation funds are distributed to the state DOTs for disbursement, largely as the state DOTs decide. It is important to note that in general state, DOTs may transfer up to 50\% of annual apportionments of STP, CMAQ, and TAP to any other program. STP and TAP funds that are sub-allocated to areas based on population, as well as Metropolitan Planning funds, cannot be transferred.

There are several ways to fund bikeway projects and they fall under these basic practices or strategies:

- Incorporation, mainstreaming, complete streets
- Budget set aside
- Pursue federal and state funds
- Pursue a variety of funding sources

Incorporating bikeways or roadway features (i.e. paved shoulders) which benefit and improve safety for bicyclists as integrated parts of larger street and highway projects is the most important funding strategy. This has also been labeled as mainstreaming, inclusion, and completing the street. This should be thought of as a longer-term strategy since any given bikeway improvement will need to be delayed until a street or highway project provides an opportunity for that bikeway to be incorporated. The cost for including bike facilities at the time of street redesign is typically just a marginal increase. Additionally, the extra space designated for bicyclists most often benefits motorists as well. For instance, bike lanes and shoulders provide more space for turns, temporary snow storage, transit stops, disabled vehicles, postal delivery vehicles, etc. This additional space, especially for rural cross-section streets (no curb or gutters), provides significant maintenance and safety benefits which increase as volumes and speeds of traffic increase.

As part of the City of Madison’s bicycle plan in 1991, the standard street cross-sections were changed to provide additional space for bicyclists. At that time the City’s plan called for wide outside curb lanes or combination bicycle/bus lanes. Every proposed arterial street cross-section included this space. During the late 1990’s the City re-examined their position on wide curb lanes and decided to convert that space into functioning bike lanes. Not only were the four lane arterials restriped to include bicycle lanes, but the new cross-sections provided in the 2000
bicycle plan included bicycle lanes. Many of the street reconstructions were funded through STP Urban funds. After 25 years of street reconstruction and pavement replacement projects, most arterial streets have bicycle lanes in the city. When state highway projects are funded within the city, state and federal funds are used to incorporate bicycle lanes, even on East Washington Avenue – one of the only six lane state highways in the city. Additionally, in 1993 the city decided to set-aside part of their STP-Urban funds for smaller bicycle and pedestrian projects and to fund a bicycle education coordinator.

A committed community should not wait until streets need to be reconstructed before bikeways are considered. It could take decades for this strategy to work. Many bikeway projects are not tied to street or highway projects and are located in separate corridors. Many arterial streets are so constrained that they cannot be widened for bikeways even with best faith efforts. Communities need to consider budgeting funds from its own general revenue sources to fund smaller projects or to gradually stage development of larger projects. Given the constraints of today's local budgets, communities may only be able to budget small amounts of funding, but even minor resources can be used for painting bicycle lanes, wayfinding signs, bicycle racks, and to match larger grants. Larger cities such as Seattle, Minneapolis, and Washington D.C. will budget in the millions of dollars per year for bicycle projects while smaller cities may contribute in the hundreds of thousands. A moderate sized city such as Madison has a separate bikeway budget of $500,000 which often swells to over $4,000,000 when all federally-funded projects are added in.

In some localities, a portion of an increase in the sales tax will be set aside for recreational trail or other conservation funding. Rarely are new taxes levied to exclusively support bicycle projects, yet an excellent example exists in Missouri. The passage of Proposition C in 2000 which created a 0.1 percent sales tax for parks and open spaces in St. Louis led to the formation of the Great Rivers Greenway District, a nonprofit organization spearheading an interconnected system of greenways, parks and trails in the region.

Over the course of the past 21 years, the level of federally funded projects has increased substantially. Aside from the projects that are incorporated into larger street and highway projects, several federal programs have become major sources for the funding of stand-alone or independent bicycle projects. These programs are primarily run by state DOTs. As a recommended practice, cities and counties should first become acquainted with the programs and the criteria established for the funding to evaluate how that matches up with their own bikeway priorities. Bicycle friendly communities should consider pursuing state and federal funds which can fund up to 80% of project costs. This is an excellent means of using potentially available resources for the development of significant bikeways. (Given the significant paperwork involved, it typically does not stand to reason to pursue federal funding for bikeway construction projects of less than $100,000.) Nearly every community of over 50,000 people within the Kansas City MPO has applied for federal funding for bicycle and pedestrian projects so this practice is already in play in the Kansas City metro area. The program having the most potential for bikeway funding is the Transportation Alternatives Program – see Table 1 for current funding levels for the MPO area.

There are a variety of sources of funding extending beyond those commonly available through federal transportation sources. Communities putting best practices into action will continue to look for funding opportunities in other places. These opportunities take a variety of forms including recreational trails and park funds, private foundation funding, and public and private utility funding. The latter has considerable potential within path corridors where utilities – transmission companies, power utilities, fiber optic carriers - are often willing to construct or reconstruct paths for the opportunity to share corridors. For example, the city of Madison has constructed or reconstructed approximately 10 miles of path through such arrangements.
Public involvement, advisory committees, advocacy groups, partnerships
Where you find successful bicycle programs you will also find a variety of local support. Often public involvement begins first as a community prepares a bicycle plan. The type of techniques to involve the public through planning initiatives has increased over time and includes the standard techniques such open houses, charrettes, workshops, committee meetings, but also includes newer approaches such on-line mapping and the use of social media. As plans are being prepared, typically a steering or advisory committee is formed to provide input.

The continued use of an advisory committee, beyond the development of a plan, is a strongly recommended best practice. Without a continuous forum for input, communities are often content to be satisfied with the status-quo. An advisory committee will provide an avenue for new ideas and will be in a position to solicit them as well. Community staff will often need the committee’s support when new ideas are incubated within city government, but little support exists for such change within city hall.

Regional and local advocacy groups can also bring public awareness to important issues. These organized groups are commonly effective, but even unorganized citizens can coalesce to provide support for important initiatives involving funding and bikeway projects, as well as non-engineering efforts such as education, enforcement, and encouragement efforts.

Communities themselves cannot take overt efforts to organize or support advocacy efforts. They can, however, ensure that the public has multiple opportunities for public involvement and, through this, groups and citizens can be brought together. Through such means, formal and informal associations are made and advocacy efforts can often arise organically.

Partnerships take on a more formal relationship between individuals or groups characterized by mutual cooperation and responsibility. Partnerships are formed when there is recognition of common goals. For instance, many local, state, and national groups have formed partnerships with each other and with public agencies to increase bicycling. Partnerships flourish when certain groups can conduct certain actions that others cannot. Some examples of the most obvious partnerships recommended as models include:

- Health officials working with local governments and advocates to improve bicycling conditions and to encourage day-to-day bicycling
- Safety organizations supporting education, enforcement and engineering efforts for bicyclists
- Businesses and advocacy groups entering into certain partnerships to encourage bicycle transportation and to include bike sharing, cyclovia, bike-to-work events, etc.

Institutionalization and complete streets
If plans are about policies, other efforts that address the design of facilities and projects are about putting those policies into action. The ultimate in best practices is when communities are so in sync with improving conditions for bicycling that they automatically incorporate facilities for bicyclists and give consideration to bicycling regardless of the scope of a project. This has been referred to as many things, but perhaps the best monikers are “institutionalization” or “mainstreaming”. Institutionalization takes on a broader meaning and can apply across the board with all of the “E’s”. Mainstreaming is a term that has been used by the Federal Highway Administration (FHWA) in the past and involves the policy and practice of including or “completing the street” for bicyclists and pedestrians. That policy has been in place since 2001 and has been spotty in its application across the nation by the FHWA offices. It acknowledges the history of ignoring bicycle and pedestrian accommodation in transportation projects, the challenges of retrofitting existing infrastructure and the complexity of developing
bicycle and pedestrian systems in built environments designed around automobile dependence. Elements of the current document allude to modern ‘Complete Streets’ principles, including providing a real choice of transportation modes. The guidance found at http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/design.cfm contains three key elements:

- a policy statement that bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist;
- an approach to achieving this policy that has already worked in State and local agencies; and
- a series of action items that a public agency, professional association, or advocacy group can take to achieve the overriding goal of improving conditions for bicycling and walking.

The Secretary of the U.S. DOT has instructed FHWA to follow this policy whenever federal funds are being used, and FHWA has also encouraged state DOT's to accept this policy. In an assessment of every street and highway crossing of the Kansas City metro area freeways (state highways), and bridges crossing major rivers, very few of them included bicycle accommodations. Although this memo is directed at communities and MARC, it is strongly recommended that Kansas and Missouri DOT's follow the federal policy. Local agencies should apply the same "mainstreaming" policies and guidance included in the federal policy as they incorporate Complete Streets practices in their own systems.

Communities such as Davis, California and Boulder, Colorado get a lot of credit for adhering to this practice for decades, but lesser known examples also exist. For example, all of Gilbert, Arizona’s major streets have bike lanes. This policy is written into the city's Public Works and Engineering Standards and Details.

The following are a list of accomplishments MARC has completed in the Complete Streets arena since the last MTP update in 2010:

- MARC Complete Streets Policy
- MARC Complete Streets Handbook
- Livable Streets fact sheet
- Health Benefits fact sheet
- Universal Design fact sheet

In addition, MARC hosts ongoing webinars on the benefits of Complete Streets, and has assisted with the development of several demonstration projects.

**Design standards**

In an effort similar to "mainstreaming" or Complete Streets, changing design and facilities manuals to include space for bicycle accommodations is an effective way to help ensure inclusion of facilities for this mode. Although nearly every reconstruction or pavement replacement project is unique, starting with street cross-sections that include bicycle lanes or paved shoulders is a significant step in accepting bicyclists in the design of projects. The written narrative explaining the design process is equally important and requires that facilities manuals clearly point out the need to include bicyclists and provide clear steps to follow if engineers want to use other cross-sections that exclude space for bicyclists.
In the past three years, numerous complete streets manuals have been completed which provide detailed design guidance on various types of bicycle accommodations given the complexity of providing space for bicyclists on existing streets where there are constraints and trade-offs. The city of Boston has an excellent guide. The city of Dallas has an outstanding set of bicycle facilities guidelines developed as part of its bicycle plan (http://dallascityhall.com/public_works/bikePlan/pdf/2011_Dallas_Bike_Plan_Addendum.pdf).
Best Practices - MPO Planning

Bicycle Planning at the Regional Level
At the regional level, MPOs provide several important functions related to bicycle planning:

- coordinate bicycle planning between jurisdictions
- develop regional bicycle plans
- establish regional project priorities
- provide technical assistance to communities
- create overall regional plans that coordinate transportation with land use (this has significant impacts on creating an environment that supports the practicality of bicycling for transportation)

Every MPO is required by federal transportation rules to plan for bicycles. Many MPOs have developed detailed bicycle plans often with pedestrian elements. Although this produces capable and comprehensive bicycle plans, the network component and other recommendations of these plans must still be included in the MPO's long-range transportation plan. Most MPOs simply include bicycle planning as part of their long-range transportation plan. All of the best planning practices cited under the first section of this memo aimed at communities also apply to MPOs. That includes public involvement, bikeway identification, and consideration of funding. The most significant difference is the scale – MPO plans should focus on regionally significant routes and projects. Appropriately, MARC considers bicycle projects that are multijurisdictional, cross major barriers, and connect existing facilities; as indicated by MARC planning guidelines: “Regional bicycle and pedestrian facilities link jurisdictions, mitigate major barriers to non-motorized travel such as rivers or highways, or connect gaps between existing facilities. These facilities could also provide connections to regional activity centers, livable communities, and transit routes.”

There are dozens of good examples of MPO plans. The best plans provide regional bikeway networks that are more than just a combination of bikeways recommended in local plans. Regional plans provide direction on key regional routes and facilities. The New Orleans Metropolitan Bicycle and Pedestrian Plan is a good example. It offers an opportunity to better integrate bicycle planning with the wider transportation plans for the City. It lays out policies and programs to promote and support increased pedestrian and bicycle transportation and safety. Many of the recommendations from this report are now being implemented by the Greater New Orleans Pedestrian & Bicycle Program.

The Metropolitan Council of the Twin Cities will soon release the Twin Cities Regional Bicycle Systems Study. The study is similar to the work MARC is undertaking with this plan and provides definitions and guidelines for the assessment of the bicycle network and recommends placement of corridors within that regional network. Priority corridors are also identified, and after engaging stakeholders, specific alignments were established within many corridors based on existing and planned bikeways. For other corridors, wide corridors are still mapped without specific street and/or path alignments. Lastly, bicycle performance measures were reviewed for consideration in the long range transportation plan.

The Flagstaff Metropolitan Planning Organization 2030 Regional Transportation Plan is a good example of a smaller MPO plan addressing the range of transportation modes. This 2009 award winning plan calls for compact development, punctuated by activity centers and an emphasis on walking and bicycling modes. In order to turn these plans into actuality, the MPO played a central role in a tax campaign that yielded dedicated taxes of more
than $800,000 annually for pedestrian and bicycle safety and capacity projects. With this money, they were able to increase their bike lane miles from 59 to 117 (http://www.flagstaff.az.gov/DocumentCenter/Home/View/10092).

**Funding and project prioritization**

MPOs have an important role of prioritizing projects for federal funding including bicycle projects. MARC reviews and recommends applications for three federal programs - Congestion Mitigation/Air Quality (CMAQ), Surface Transportation Program (STP), and Transportation Alternatives (TAP) (see Table 1 for a list of current funding allotments).

Having project selection criteria that includes safety, potential for increasing bicycle trips and reducing automobile trips (relative to cost of the project), relationship to regional plans, and project readiness are important criteria to start with. As with any rating scheme, being able to support the criteria with quantifiable data is difficult, but should not stymie efforts to continue to improve the rating process.

Two important funding strategies exist for use of STP funding at the MPO level. A time-tested strategy is to ensure that criteria used to rate and fund street and highway projects include strong consideration of bicycle and pedestrian facilities. Dozens, perhaps over a hundred MPOs, now make it virtually impossible to fund a street project within an MPO with STP funding without bicycle and pedestrian accommodations. The Green Bay and Madison, Wisconsin MPOs were some of the first MPOs to incorporate this strategy for approval of STP-Urban funds in the early 1990s.

Secondly, more MPOs have now created a set-aside of STP funds for bicycle and pedestrian projects. Although this practice has been used sparingly by other MPOs in the past, more MPOs are beginning to consider this. For instance, the Metropolitan Area Planning Association in Omaha has factored a fair amount of flexibility in how they use STP funds to fund bicycle and pedestrian projects. Depending on the quality of applications and how they meet approved criteria, up to 25% of MAPA’s annual STP apportionment can go to bicycle and pedestrian projects. The more funds flexed, the more it would exceed a more standard allocation of Transportation Alternatives funding.

**Technical assistance**

There is typically no entity within in an MPO that is better prepared to provide technical assistance to communities on bicycle planning than an MPO itself. This stems from the MPO's expertise honed as it prepared its own regional bicycle plans, its knowledge of state and national guidelines, and its overall familiarity of the communities within the region. An MPO's ability to provide technical assistance is limited – although they can advise a community on how to do a plan, they usually do not have the resources to actually prepare a community bicycle plan in the first place. A list of recommended best practices for technical assistance for MPOs includes:

- **Guidelines**
  MPOs should provide guidance on how to develop bicycle plans. Often this means that MPOs modify, adopt and use other state and national guidelines as their own. An example of a MPO planning guide is at http://www.dot.wisconsin.gov/projects/state/docs/bike-guidance.pdf

- **Workshops and conferences**
  An excellent way to help inform communities of current and best practices is through the sponsorship of conferences and workshops.
• **Technical tools**
  During the past 10 years an increasing number of analysis tools have been developed including bicycle level-of-service models, crash analysis tools, and mapping tools. It is impractical to expect that communities can easily become adept at using these tools without some upfront assistance. Additionally, some of the analyses are more easily done at the regional level to begin with.

• **Planning coordination**
  MPOs the size of MARC will focus on regional bikeway routes. Counties and communities will also work on locally-significant routes that tie into the regional network. As an MPO, helping to coordinate this will result in a more complete bikeway system and will provide the opportunity for a community to learn more about the MPO bicycle plan and resources available through the MPO.
Five peer Metropolitan Planning Organizations (MPOs) were contacted to survey their practices associated with bicycle planning and the current state of the implementation of their plan. Current plans were reviewed before making contact with the MPOs. All of the MPOs were contacted and personal interviews were possible with agency representatives for four of the five. The five MPOs are:

- Madison-Area MPO, Madison, WI
- Metropolitan Area Planning Agency (MAPA), Omaha, NE
- Des Moines Area MPO, Des Moines, IA
- Metropolitan Council, Minneapolis-St. Paul, MN
- Kentuckian Regional Planning and Development Agency (KIPDA), Louisville, Kentucky

Despite repeated attempts, no one at the Kentuckian Regional Planning and Development Agency (KIPDA) was available for a personal interview. A change in staffing compounded the problem. However, a base level of information was still available and a contact was made with a planner working on the update of the Louisville long range transportation plan.

The following is a summary of those five surveys.

- Every MPO, except KIPDA, either has a free-standing bicycle and pedestrian plan or they were working on one. Most MPOs provided some guidance on bicycle planning to communities mostly because of their familiarity with doing the regional bicycle plans. Similarly, all of the MPOs were offering at least limited services for transportation planning based on their knowledge and expertise as regional transportation planning organizations. The Metropolitan Council in the Twin Cities reviewed local bicycle plans, but that was as close as any organization got to actually completing local plans. The MPOs were available for limited assistance, for general coordination and for participating on local planning advisory committees.

- The Metropolitan Council offered the most assistance with other planning efforts in large part due to its organization’s role in community development activities. This assistance was limited to review of plans and technical assistance. None of the other MPOs offered any of the other forms of planning or prepared local plans that featured the following: sidewalk planning, comprehensive planning, greenways/trails, and park/recreation.

- Only the Des Moines MPO had a standing bicycle and pedestrian committee, while the other MPOs made use of advisory committees while plans were being developed.

- Every one of the MPOs had at least one bicycle friendly community within their region, but none of them helped with the applications. A couple of the MPOs said that they encouraged participation in the BFC program, but acknowledged it was at low level of effort.
None of the MPOs had formally adopted any bicycle facility guidelines. Several of the MPOs mentioned that they use or are familiar with the AASHTO guidelines. Additionally, two mentioned that they felt that the use of the guidelines is pretty much up to the communities and counties since they are responsible for actual project implementation. The Madison MPO included a concise summary of the facility guidelines in their plan which was based directly on the AASHTO guidelines.

Communities within all of the MPOs provided nearly the complete set of bikeway facilities as listed in the survey. There were two exceptions. Only City of Madison, City of Louisville and the Met Council communities provided both green bike lanes (at conflict points) and only Madison was using bike boxes. Louisville and Minneapolis are currently adding bike boxes this Spring or Summer.

None of the MPOs offered bicycle education or safety programs directly to communities; however, there were a few notable offerings. MAPA funds a comprehensive bicycle education program on contract with Live Well Omaha, and the City of Madison’s bicycle safety coordinator has been funded through the MPO for over 20 years (using STP urban funds).

None of the MPOs were collecting their own bicycle count data, but several were participating. For instance the Des Moines MPO was providing the actual counters, but expecting the counts to be done by the local units of government. In Madison, staff assisted the one-day field counts by dedicating the help of a few staff people. The Bicycle Federation of Wisconsin leads this annual effort.

None of the MPOs collected bicycle crash data. All of them indicated that they did analyze available bicycle data for the plans they were doing. None of them were doing regular crash analyses or reports.

The MPOs all responded differently to the question on implementation. The Metropolitan Council at first indicated that they do no implementation and that they have advisory authority only. However, Steve Elmer went on to explain how they expect to work directly with communities to begin fleshing out alignments for their new corridor study. He also mentioned ways they can influence project development through the selection of projects. Mike Cechvala of Madison simply stated that they do a lot through coordination, but also acknowledged that their plan is 14 years old. Mike Helgerson from MAPA MPO had the most complete answer indicating their involvement in the bicycle education program, the funding and current development of a new bicycle and pedestrian plan, and that there is an approach in development on how to fund projects in way that is consistent with their new plan. Aaron Bartling with the Des Moines MPO indicated that there has been a decided shift in how area communities are focusing on bicycle transportation with more on-street facilities while also expressing an uptick in implementation.

Other Comments and Conclusion

There were some noteworthy comments that were made by the MPOs or simply some observations that might be of interest to MARC:

For the Des Moines MPO plan, a bicycle Level of Service (LOS) was added as a factor in the STP scoring system for road projects with and without bicycle accommodations. “Adding Bicycle LOS as a factor in the STP scoring process could help the MPO, the CIRTPA, and the Ames Area MPO consider bicyclists during the planning process. By planning and designing transportation projects with a Bicycle LOS score of C or better, the MPO, the CIRTPA, and the Ames Area MPO can ensure that no projects applying for STP funding will worsen a road’s Bicycle LOS.” The Des Moines MPO plan
also included several interesting benchmarks and policies in their bike plan:

- Integrate 100 miles of bicycle lanes on central Iowa’s arterial and collector roads, by 2020.
- Install paved shoulders on 50% of county roads where bicycle use or demand is potentially high, by 2020.
- Amend the MPO’s STP Guidelines scoring criteria to award extra points for projects that include bicycle and pedestrian accommodations, by Federal Fiscal Year 2015.

- The Madison MPO has always been a leader in Wisconsin and the country in bicycle planning. The MPO has been a major player in developing a city of Madison bicycle plan, an MPO bike plan, and a county bike plan. Major changes occurred in the early 1990’s for the MPO when they changed the STP criteria to make it nearly impossible for a community to get STP funds without a “complete street” (well before the notion of complete streets was hatched). They were also one of the first MPOs to provide STP urban funding for bicycle-only projects.

- MAPA and the Met Council are doing regional bikeway corridor identification that are most on par with the work currently in progress for MARC.

- Although KIPDA has not been terribly active in bicycle planning they have identified a general set of bikeway corridors. The City of Louisville within the KIPDA region has made considerable progress in just the last two years and is worth keeping on the MARC radar. Many of the facilities put in place were done just last year and already this year. The city also has a very good on-line bike map which recommends point to point travel for bicyclists using 3 different routes based on directness and safety.

The full survey results for each MPO that was interviewed are attached.
Madison-Area MPO – Michael Cechvala

1. Does your MPO have a regional active transportation, bike/ped or non-motorized transportation plan?
   Yes, bike plan since 1980’s. Currently being updated from year 2000 edition. Plan coordinated with City of Madison long range plan update. No free-standing ped plan, but part of long range transportation plan.
   a. If so, can you provide us with a copy of the plan/map? Yes, can provide a link. http://www.cityofmadison.com/trafficEngineering/documents/BikeTranspPlan/bikeplanoo.pdf

2. Does your MPO encourage/assist local communities with bike/ped needs and planning?
   a. If so, which types:
      i. Bikeway Master Plan Y
      ii. Pedestrian Safety Action Plan N
      iii. Sidewalk Plan N, but sidewalk inventory in Madison
      iv. Comprehensive Plan Y
      v. Transportation Plan Y
      vi. Parks and Recreation Plan N
      vii. Greenway Linkage Plan Y
      viii. Trails Plan Part of bike plan
      ix. Multi-modal Corridor Plan Y
      x. Other plan/document

3. Does your MPO have a community-based bike/ped advisory committee? Just to update plan.

4. Are there communities which have achieved “Bicycle Friendly Community” designation in your region? Y, Madison and Fitchburg

5. Do you have a program to encourage Bicycle Friendly Community or Walk Friendly Community designations for communities in your region? No, but will provide assistance

6. Does your MPO collect bike/ped count data? No, but assisted Bicycle Federation in manual counts in the Fall
   a. If so, do you have a standard methodology?
   b. Please describe your methodology.

7. Does your MPO encourage state and/or local communities to collect bike/ped counts? Yes, recommended in the plan

8. Does your MPO provide facility design and industry best practices guidance for local agencies.
   a. If so, which guidelines do you promote? (AASHTO, NACTO, other?)
      Guidelines provided in the plan’s appendix – consistent with AASHTO guidelines

9. What types of facilities are used in your MPO region? (Optional: Can they tell us how many miles of each?)
   a. Bike lanes Y
   b. Buffered bike lanes Y
   c. Bike route and wayfinding signs Y
d. Share the road signs y
e. Bike boxes y
f. Shared use paths y
g. Green bike lanes y, but only at conflict areas
h. Wide curb lanes y, but most converted to bike lanes in past 10 years
i. Share lane markings y
j. Paved shoulder y
k. Side paths y, but few compared to shared use paths within their own corridor

10. Does your MPO provide educational programs for bike/ped safety? N, but safety info is provided with rideshare outreach

11. Does your MPO collect and analyze bike/ped safety data? Analyze especially for plan, but no special reports. Does not collect data.
   a. If so, please describe your methodology.

12. How is your MPO implementing your bike/ped plan?
   14 year old plan so implementation has waned. Not a ped plan. Implementation has been successful normally through regional coordination, STP-Urban funding consistency, TAP direction. Any federally funded project gets bike and ped facilities, power of influence over any project that gets state and/or federal funding.
   a. Local Agency Group -
   b. Civil Leader Group
   c. Friends Groups
   d. Other

Other Notes:
Madison MPO has had a strong relationship with both the city and Dane county in developing and sponsoring a bicycle plan. In the early 1990's they changed the STP criteria to make it virtually impossible to fund a STP project without it being a "complete street." That same criteria also made it possible for the funding of minor bike and ped standalone projects.
1. Does your MPO have a regional active transportation, bike/ped or non-motorized transportation plan?  
   Currently being developed as a free-standing plan. Bicycle and pedestrian elements approved as part of 
   long range transportation plan. 
   a. If so, can you provide us with a copy of the plan/map? When complete, yes

2. Does your MPO encourage/assist local communities with bike/ped needs and planning?   
   a. If so, which types: ?
      i. Bikeway Master Plan – no, but currently in the works
      ii. Pedestrian Safety Action Plan - no
      iii. Sidewalk Plan - no
      iv. Comprehensive Plan – yes, coordinates with comp planning
      v. Transportation Plan – a long range transportation plan for the metro area and will often 
         assist a community
      vi. Parks and Recreation Plan - no
      vii. Greenway Linkage Plan - no
      viii. Trails Plan – county wide - coordinates with National Park Service
      ix. Multi-modal Corridor Plan – yes regional transit vision
   x. Other plan/document

3. Does your MPO have a community-based bike/ped advisory committee? No

4. Are there communities which have achieved “Bicycle Friendly Community” designation in your region? 
   Yes, Omaha is bronze

5. Do you have a program to encourage Bicycle Friendly Community or Walk Friendly Community 
   designations for communities in your region? no

6. Does your MPO collect bike/ped count data? Does not collect, but will analyze for plan products. 
   a. If so, do you have a standard methodology? 
   b. Please describe your methodology.

7. Does your MPO encourage state and/or local communities to collect bike/ped counts? Yes, Omaha 
   collects data

8. Does your MPO provide facility design and industry best practices guidance for local agencies. 
   a. If so, which guidelines do you promote? (AASHTO, NACTO, other?) no

9. What types of facilities are used in your MPO region? (Optional: Can they tell us how many miles of each?) 
   a. Bike lanes y
   b. Buffered bike lanes y
   c. Bike route and wayfinding signs y
   d. Share the road signs y
   e. Bike boxes n
   f. Shared use paths y
g. Green bike lanes n
h. Wide curb lanes y, but very few and not done for bicyclists
i. Share lane markings y
j. Paved shoulder Y
k. Side paths y

10. Does your MPO provide educational programs for bike/ped safety? Yes, MAPA sponsors Live Well Omaha which conducts courses for adults and children

11. Does your MPO collect and analyze bike/ped safety data? No, just for plans. Does a regional crash map of all crashes – does include Omaha and Iowa, but not suburbs in Nebraska
   a. If so, please describe your methodology.

12. How is your MPO implementing your bike/ped plan?
   a. Local Agency Group
   b. Civil Leader Group
   c. Friends Groups
   d. Other

Other Notes:
- Doing a bike and pedestrian plan
- On-going “complete streets” policies
- Education program – Live Well Omaha
- Funding – Made available and will flex STP funds for TAP projects if key projects are submitted
- STP program had no criteria 3 years ago to prioritize bicycle and pedestrian accommodations. Now includes criteria.
- As soon as bike/ped plan is done, projects have to be consistent with corridor plan and complete streets approach.
1. Does your MPO have a regional active transportation, bike/ped or non-motorized transportation plan?
   a. If so, can you provide us with a copy of the plan/map?
      Yes, a free standing bicycle plan - Connect: Central Iowa Bicycle and Pedestrian Transportation Action Plan (http://dmampodemo.files.wordpress.com/2013/10/connect-august-5-2009-final.pdf). Also a bicycle and pedestrian element included in LRTP. Together these two plans include Inventory, Gap Identification, Assessment of BLOS, Crash Mapping, Planned Facilities, Bicycle and Pedestrian Supportive Land Use Strategies, Implementation Strategies & Policies. Plan knits together community plans, but no regional corridors proposed. Interesting LOS goal (added at end).

2. Does your MPO encourage/assist local communities with bike/ped needs and planning?
   a. If so, which types:
      i. Bikeway Master Plan – on street regional bikeway facilities plan
      ii. Pedestrian Safety Action Plan – recommended in the plan
      iii. Sidewalk Plan - no
      iv. Comprehensive Plan - no
      v. Transportation Plan – just regional
      vi. Parks and Recreation Plan - no
      vii. Greenway Linkage Plan - no
      viii. Trails Plan - no
      ix. Multi-modal Corridor Plan - no
      x. Other plan/document

3. Does your MPO have a community-based bike/ped advisory committee? Yes, various “Roundtables” (this seems to be a unique way to help put into action a variety of their plans).

4. Are there communities which have achieved “Bicycle Friendly Community” designation in your region? Yes, Des Moines

5. Do you have a program to encourage Bicycle Friendly Community or Walk Friendly Community designations for communities in your region? No

6. Does your MPO collect bike/ped count data? No, but have trail counters which are loaned to communities. The data is then shared.
   a. If so, do you have a standard methodology?
   b. Please describe your methodology.

7. Does your MPO encourage state and/or local communities to collect bike/ped counts? yes

8. Does your MPO provide facility design and industry best practices guidance for local agencies.
   a. If so, which guidelines do you promote? (AASHTO, NACTO, other?) Promotes the AASHTO guidelines in plan

9. What types of facilities are used in your MPO region? (Optional: Can they tell us how many miles of each?)
a. Bike lanes - y
b. Buffered bike lanes - n
c. Bike route and wayfinding signs - Y
d. Share the road signs - y
e. Bike boxes - n
f. Shared use paths - y
g. Green bike lanes - n
h. Wide curb lanes - y
i. Share lane markings -Y
j. Paved shoulder -y
k. Side paths - y

10. Does your MPO provide educational programs for bike/ped safety? No, but many recommendations in plan. Webinar series. Low effort

11. Does your MPO collect and analyze bike/ped safety data? No, but use DOT crash data; crashes are a performance measure
   a. If so, please describe your methodology.

12. How is your MPO implementing your bike/ped plan?
   Have had lots of trails put in place in the past, but more focus on on-road. Des Moines doing well and now more focused on transportation and on street facilities.
   a. Local Agency Group
   b. Civil Leader Group
   c. Friends Groups
   d. Other

Other Notes:
- Added the Bicycle LOS as a factor in the STP scoring system for road projects with and without bicycle accommodations. “Adding Bicycle LOS as a factor in the STP scoring process could help the MPO, the CIRTPA, and the Ames Area MPO consider bicyclists during the planning process. By planning and designing transportation projects with a Bicycle LOS score of C or better, the MPO, the CIRTPA, and the Ames Area MPO can ensure that no projects applying for STP funding will worsen a road’s Bicycle LOS.”
- Interesting Benchmarks from bike plan:
- 3.3.1. Benchmark: Identify all central Iowa arterial and major collector roadway locations suitable for bicycle lanes, by 2011.
- 3.3.2. Benchmark: Integrate 100 miles of bicycle lanes on central Iowa’s arterial and collector roads, by 2020.
- Other key policies:
- Install paved shoulders on 50% of county roads where bicycle use or demand is potentially high, by 2020.
- Amend the MPO’s STP Guidelines scoring criteria to award extra points for projects that include bicycle and pedestrian accommodations, by Federal Fiscal Year 2015.
1. **Does your MPO have a regional active transportation, bike/ped or non-motorized transportation plan?** A regional bicycle system study was just finished and was made part of the transportation policy plan. This plan lays out an approach and a mapped corridor system comprised of bikeways.
   a. **If so, can you provide us with a copy of the plan/map?**

2. **Does your MPO encourage/assist local communities with bike/ped needs and planning?**
   The Met Council conducts a full range of planning for the Twin Cities metro area. The following questions were answered in a way which reflects what the Met Council offers and not necessarily just what the MPO offers.
   a. **If so, which types: ?**
      i. Bikeway Master Plan no, but assistance including grants, local assistance handbook
      ii. Pedestrian Safety Action Plan, no
      iii. Sidewalk Plan, no
      iv. Comprehensive Plan, Comp plans have to be reviewed by Met council. The Met council provides assistance, but does do the community plans.
      v. Transportation Plan, no, but community transportation plans are reviewed by them
      vi. Parks and Recreation Plan, Regional plan produced, community plan reviewed by Met Council and approved. Funding contingent on approval
      vii. Greenway Linkage Plan, no greenway plan per se, but a regional parks and trails plan covers many greenway locations
      viii. Trails Plan no
      ix. Multi-modal Corridor Plan, does transit planning
      x. Other plan/document

3. **Does your MPO have a community-based bike/ped advisory committee? no**

4. **Are there communities which have achieved “Bicycle Friendly Community” designation in your region?**
   St. Paul, Minneapolis, Richfield, and Edina

5. **Do you have a program to encourage Bicycle Friendly Community or Walk Friendly Community designations for communities in your region? no**

6. **Does your MPO collect bike/ped count data? No. But lots of counting taking place sponsored by others.**
   Consumer of count data BTW -has a regional bicycle travel planner called cyclopath which provides origin-destination recommendations for bicyclist trips (the usefulness has been usurped by Google planner)
   a. **If so, do you have a standard methodology?**
   b. **Please describe your methodology.**

7. **Does your MPO encourage state and/or local communities to collect bike/ped counts?**
   Maybe included in a policy statement someplace.
8. Does your MPO provide facility design and industry best practices guidance for local agencies.
   a. If so, which guidelines do you promote? (AASHTO, NACTO, other?) No design guidelines approved. Wayfinding guidelines? Transit oriented development. Trans Policy plan

9. What types of facilities are used in your MPO region? (Optional: Can they tell us how many miles of each?)
   a. Bike lanes ☑
   b. Buffered bike lanes ☑
   c. Bike route and wayfinding signs ☑
   d. Share the road signs ☑
   e. Bike boxes ☑, but on drawing board
   f. Shared use paths ☑
   g. Green bike lanes ☑
   h. Wide curb lanes ☑
   i. Share lane markings ☑
   j. Paved shoulder ☑
   k. Side paths ☑

10. Does your MPO provide educational programs for bike/ped safety? ☑

11. Does your MPO collect and analyze bike/ped safety data? Consumer of data and will analyze for plans
   a. If so, please describe your methodology.

12. How is your MPO implementing your bike/ped plan? Traditionally has shied away from a mapped plan, but now has bikeway study and broad corridors.
   a. Local Agency Group
   b. Civil Leader Group
   c. Friends Groups
   d. Other
   Steve: Not implementing per se, two systems within in the Met Council that are responsible for bicycle and pedestrian – the MPO (transportation) and community development (recreation). Parks dept is in com develop division and they plan and fund regional park system. Also the met council bonds for projects. Communities are the real implementers. For STP urban – have to prove transportation function for an independent project. Met used prioritization factors (as referred to as Investment Priorities and Requirements) and one of those is multi-modal – how it serves all users, overcomes barriers and improves safety. Separate criteria for free– standing bike and ped projects.

Other Notes:
   • Will be doing a Regional solicitation – TAP and Urban STP for 2018/2019. Are revising the criteria based on bike study.
   • Tier one and tier two corridor projects from study will receive priority points (see map in study). Can still fund “Critical bicycle links” that are not tier one or two if they overcome a barrier, etc.
   • This is the main way projects are tied to the plan.
With the study being completed and incorporated into LRTP, the Met will be more involved in coordination and support for network build out. That means working with communities in defining alignments. 1300 miles of proposed alignment – twice the mileage of peer MPOs.

TPH Comments – this seems to be a very similar plan/study to what MARC is doing. I would have thought that the Met Council would have done this 15 years ago, but is only a year ahead of MARC. Is a good plan to watch on how it is implemented. Steve is a good contact and is interested in KC plan.
1. Does your MPO have a regional active transportation, bike/ped or non-motorized transportation plan? Page 31 and 32 of long range transportation plan - http://www.kipda.org/files/PDF/Transportation_Division/LRP/MTP2030/06_AltModes.pdf
   a. If so, can you provide us with a copy of the plan/map?
      http://www.kipda.org/files/PDF/Transportation_Division/Maps/bike_ped_sml_upd_.pdf

2. Does your MPO encourage/assist local communities with bike/ped needs and planning?
   a. If so, which types: ?
      i. Bikeway Master Plan n
      ii. Pedestrian Safety Action Plan n
      iii. Sidewalk Plan n
      iv. Comprehensive Plan n
      v. Transportation Plan y, but on regional level
      vi. Parks and Recreation Plan ?
      vii. Greenway Linkage Plan n
      viii. Trails Plan n
    ix. Multi-modal Corridor Plan ?
    x. Other plan/document TDM program

3. Does your MPO have a community-based bike/ped advisory committee? n

4. Are there communities which have achieved “Bicycle Friendly Community“ designation in your region? Louisville

5. Do you have a program to encourage Bicycle Friendly Community or Walk Friendly Community designations for communities in your region?

6. Does your MPO collect bike/ped count data? n
   a. If so, do you have a standard methodology?
   b. Please describe your methodology.

7. Does your MPO encourage state and/or local communities to collect bike/ped counts?

8. Does your MPO provide facility design and industry best practices guidance for local agencies.
   a. If so, which guidelines do you promote? (AASHTO, NACTO, other?)

9. What types of facilities are used in your MPO region? (Optional: Can they tell us how many miles of each?)
   a. Bike lanes y
   b. Buffered bike lanes y
   c. Bike route and wayfinding signs y
   d. Share the road signs
   e. Bike boxes y
   f. Shared use paths y
g. Green bike lanes
h. Wide curb lanes, but not specifically intended for bicyclists
i. Share lane markings
j. Paved shoulder
k. Side paths

10. Does your MPO provide educational programs for bike/ped safety? n

11. Does your MPO collect and analyze bike/ped safety data? n
   a. If so, please describe your methodology.

12. How is your MPO implementing your bike/ped plan?
   a. Local Agency Group
   b. Civil Leader Group
   c. Friends Groups
   d. Other

Other Notes
- KIPDA has not been a leader in bicycle planning; however, the City of Louisville has made considerable progress in just the last two years. Many of the facilities put in place were done just last year and this year. The city updated its plan in 2010: http://www.louisvilleky.gov/BikeLouisville/bikefriendly/2010bikemasterplan.htm
- The city has what appears to be a very good on-line point to point bike map which recommends 3 different routes based on directness and safety. Also provides total elevation change. http://www.ridethecity.com/louisville#3509422
MARC Regional Bikeways Plan
Bicycle Facilities Design Guidelines Overview

Introduction

The design guidelines contained in this section are intended to support the recommendations presented in this plan. They are not intended as comprehensive design standards. Rather, they reference existing design standards and provide clarification or supplemental information as necessary. There are six primary sources of bicycle and pedestrian facility design information that were used to develop the guidelines provided in this section:

1. The Mid-America Regional Council and the Kansas City Metro Chapter of the American Public Works Association Best Practices Local Bikeway Planning and Design Guide
2. Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) – The MUTCD is the national standard for signing, markings, signals, and other traffic control devices.
3. American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities – This document is intended to present information on how to accommodate bicycle travel and operations in most riding environments. It is the design guidance upon which most state and local design guidelines are based. In many jurisdictions this document is considered to set the minimum values for bicycle design.
4. AASHTO Guide for the Planning, Design, and Operations of Pedestrian Facilities – This document is intended to present information on how to accommodate pedestrian travel and operations in (primarily) roadway environments. It is the design guidance upon which most state and local design guidelines are based. In many jurisdictions this document is considered to set the minimum values for pedestrian design.
5. Institute of Transportation Engineers Designing Walkable Urban Thoroughfares: A Context Sensitive Approach – This document’s development was supported by FHWA. Designing Walkable Thoroughfares helps designers understand the flexibility for roadway design that is inherent in the AASHTO guide A Policy on the Geometric Design of Highways and Streets with a focus on balancing the needs of all users.
6. National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide – FHWA has issued a memo supporting the use of this document to further develop non-motorized transportation networks, particularly in urban areas. Many of the designs in this document have been used successfully in urban areas. However, care should be exercised when applying the treatments described in this document to suburban or rural areas.

In this guidance section of the MARC Regional Bikeways Plan the following facility types are discussed:

- sidewalks,
- curb ramps,
- bike lanes,
- shared lane markings,
- bike boulevards,
- buffered bike lanes,
- cycle tracks,
- midblock crossings, and
- shared use paths.
Sidewalks

For the purposes of design, the term sidewalk means a smooth, paved, stable and slip-resistant, exterior pathway intended for pedestrian use along a vehicular way. All sidewalks constructed within the MARC region must be compliant with the Americans with Disabilities Act Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (July 26, 2001) or most recent ADA standards for public rights of way. Sidewalks should be provided on both sides of all public roadways. Sidewalks are not a bicycle facility however; because cyclists ride along the sidewalks we have included them into this section.

Sidewalk Width

The preferred minimum sidewalk width is 5 feet. Under constrained conditions, 4-foot wide sidewalks are acceptable provided a 5-foot by 5-foot area with less than 2% cross slope is provided every 200 feet (maximum) to allow for the passing of one pedestrian using a wheelchair by another. Sidewalks placed at the back of curb should be at least 6 feet wide.

Location of Sidewalks

On roadways with curb and gutter sidewalks should be located six feet from the back of curb. This minimizes the encroachment of curb ramps and driveway cuts into the sidewalk width. On roadways without curb and gutter sidewalks should be separated from the roadway as shown by the following criteria, which are given in a sequence of desirability:

- at or near the right of way line (ideally, 3 feet of width should be provided behind the sidewalk for utilities or to match existing grades),
- outside of the minimum required roadway clear zone, or
- as far from the edge of the driving lane as practical.

Sidewalk alignments, which are set back from the roadway, should taper for alignment closer to the roadway at intersections. This will allow for coordinated placement of crosswalks and stop lines.

Sidewalk Slopes

The maximum cross slope on a sidewalk is 2%. This includes pedestrian access routes across driveways and crosswalks at intersections.

Sidewalks may follow the grade of the adjacent roadway. However, on new structures the grade of the sidewalk cannot exceed 5%. If a grade of more than 5% is required on a new structure, an ADA compliant ramp must be provided.

Curb Ramps and Blended Transitions

A curb ramp is a ramp that cuts through or is built up to the curb. A blended transition is a relatively flat area where a sidewalk meets a roadway. Curb ramps and blended transitions are primarily used where a sidewalk meets a roadway or driveway at a pedestrian crossing location. Blended transitions include raised pedestrian street crossings, depressed corners, or similar connections between pedestrian access routes at the level of the sidewalk and the level of the pedestrian street crossing that have a grade of 5% or less. Accessibility requirements for blended transitions serve two primary functions. First, they
must alert pedestrians that have vision impairments to the fact that they are entering, or exiting, the vehicular area. Second, they must provide an accessible route for those using wheelchairs or other assistive devices. Ideally, a separate ramp should be provided for each crossing of the roadway.

**Curb Ramp Slopes**

The slope of a curb ramp shall not exceed 8.33%. The only exception to this standard is when a sidewalk is located along a roadway with a significant slope, in which case the maximum length of the curb ramp is 15 feet.

**Landings**

All curb ramps must have a landing at the location where a wheelchair user would have to turn to prepare to enter the roadway. For perpendicular ramps, this means a 4-foot by 4-foot landing at the top of the ramp (5-foot by 5-foot if there is a vertical obstruction adjacent to the landing). For parallel ramps where the sidewalk is depressed, the 4-foot by 4-foot landing is required at the bottom of the ramp.

**Detectable Warnings**

Detectable warning surfaces shall extend a minimum of 2 feet in the direction of pedestrian travel and shall extend the full width of the curb ramp. Detectable warning surfaces are not required, nor desirable, at crossings of residential driveways since the pedestrian right-of-way continues across the driveway aprons. However, where commercial driveways are provided with yield or stop control, detectable warnings should be provided at the junction between the pedestrian and vehicular routes.

**Bike Lanes**

A bike lane is a portion of the roadway that has been designated for preferential or exclusive use by bicyclists by striping, signing and pavement markings (the MUTCD does not require signs). Bike lanes are intended for one-way travel, usually in the same direction as the adjacent travel lane. Bike lanes should be designed for the operation of bicycles as vehicles. They should be designed to encourage bicyclists and motorists to interact in a safe, legal manor.

**Width**

On roadways with curb and gutter, or next to parallel parking, the minimum bike lane width is 5 feet. On roadways with open shoulders a 4-foot bike lane is permissible. Additional width may be desirable on higher speed roadways. Bike lanes should be designated with bike lane markings, arrows, and bike lane signs.
Intersections

At intersections, bike lanes must be designed to encourage legal movements at the intersection; this includes proper positioning of bicyclists and motorists. Bike lane stripes should be dashed on the approaches to intersections without right turn lanes. Where there are right-turn lanes, through bike lanes must be placed to the left of the right turn lane. Section 4.8 of the AASHTO Guide for the Development of Bicycle Facilities (2012) provides numerous graphics illustrating bike lane markings at intersections.

Bike lanes should be continuous through intersections. That is, if a bike lane is provided to the intersection, a receiving bike lane should be provided on departure side of the intersection.

Two-Stage Left Turn Box

One method that many bicyclists use to turn left at busy intersections is to make a through movement, turn the bike, then make a second through movement—a two-stage left turn. A two-stage left turn box is simply a designated place for bicyclists to stage in beyond a crosswalk.

Advance Stop Line Bike Box

The more common implementation of a bike box, in which the box is placed between the stop bar and the crosswalk to provide for queuing of through bicyclists, is illustrated below (source: NACTO Urban Bikeway Design Guide). It should be noted that in some states some operational factors may prevent this application from operating as intended. This occurs because right turn motorists are discouraged from moving into the bike lane (separated by a solid line), while the rules of the road (including those in Kansas\(^1\) and Missouri\(^2\)) require that right turns be made as close as practical to the right hand curb edge of the roadway.

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1 Kansas Statutes, 8-1545. Required position and method of turning vehicles. (a) The driver of a vehicle intending to turn shall do so as follows: (1) Right turns. Both the approach for a right turn and a right turn shall be made as close as practicable to the right-hand curb or edge of the roadway.

2 Missouri Revised Statutes, 304.341. 1. The driver of a vehicle intending to turn at an intersection shall do so as follows: (1) Right turns. -- Both the approach for a right turn and a right turn shall be made as close as practicable to the right-hand curb or edge of the roadway. Missouri prohibits blocking or driving in a bike lane except when making an otherwise lawful maneuver that requires driving in the bike lane.
Green Bike Lanes

Some communities have begun using green paint in bike lanes to call motorists attention to potential conflict areas between motorists and bicyclists. Green paint is intended as a supplement to proper bike lane markings.

Buffered bike lanes

A buffered bike lane is a bike lane that is separated from adjacent through lanes by a striped out buffer area. In some locations it may be desirable to use less than the full space available for a bike lane. Such locations include sections of roadway where a wide bike lane might be perceived as on-street parking or another travel lane. In these locations a buffered bike lane may be considered. A buffered bike lane may also be considered where a bike lane of six or more feet is being provided to meet a minimum level of accommodation. At midblock locations the buffered bike lane is separated from the travel lanes by a chevron labeled buffer. The width of the buffer will vary depending upon such conditions as motor vehicle speed, percent heavy vehicles, roadway cross slopes, and desired level of accommodation of bicycles.

At intersections, buffered bike lanes must be striped to allow for right turning motorists. Typically this is done by eliminating the buffer on the approach to intersections and striping the area as one would a regular bike lane.

Cycle Tracks

Cycle tracks are bikeways located on the street between the general travel lanes and the sidewalk. They are distinct from shared use paths in that they are bicycle only facilities. Typically they are separated from the general travel lanes by on street parking and a physical divider. Operationally, they can be very challenging particularly at their intersections with driveways and streets.

There are no national standards for cycle tracks; research is currently underway to identify best practices. However, some guidance is provided for those designers who may have cycle tracks included on their projects. The NACTO Urban Bikeway Design Guide provides information on the operations of cycle tracks; FHWA is currently developing a best practices report on cycle track design.
The implementation of cycle tracks may require close coordination with local businesses to coordinate their parking needs and loading zone requirements that may conflict with the cycle tracks.

Ideally, cycle tracks are one-way facilities. However where there are space constraints or wrong way riding is common, two-way facilities may be considered.

The separation between the cycle track and the adjacent travel lane or on street parking should be at least four feet. This is to provide space for opening car doors when on street parking is present.

At right turn conflict points, motorists should be required to yield to bicyclists on the cycle track. At intersections the cycle track is discontinued and the space is used as shared space for right turning motorists and through cyclists. Left turns are addressed through a pair of through movements or through an upstream weave. Space on the far side of intersecting roadways is provided for bicyclists to stage prior to making their second through movement. An example of treatments at conflict points and intersections is provided in Figure 14-22. A BEGIN RIGHT TURN LANE YIELD TO BIKES (R4-4) could be installed on the island at the beginning of the turn lane.

### Shared Lane Markings

A Shared Lane Marking (SLM) is a pavement symbol that indicates an appropriate bicycle positioning in a shared lane. Research suggests that SLMs:

- assist bicyclists with lateral positioning in a shared lane with on-street parallel parking to reduce the chance of a bicyclist’s impacting the open door of a parked vehicle,
- assist bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane,
- alert road users of the lateral location bicyclists are likely to occupy within the traveled way,
- encourage safe passing of bicyclists by motorists, and
- reduce the incidence of wrong-way bicycling.
SLMs are not to be used on shoulders or in designated bicycle lanes. The MUTCD includes a guidance statement saying that the SLM should not be placed on roadways that have a speed limit above 35 mph. While this does not preclude the use of SLMs on higher speed roadways, no research is available as yet to suggest how effective they may be on higher speed roadways.

One purpose of SLMs is to encourage good lane position by bicyclists; or to discourage them from riding too close to parked cars or from hugging the curb. Consequently, the MUTCD requires they be placed with the marking centerline at least 11 feet from the face of curb on roadways with on-street parking and at least 4 feet from the edge of pavement on other roadways.

When used, SLMs should be placed after each intersection and then periodically at a spacing not exceeding 250 feet between markings.

SLMs are sometimes used at the ends of bike lanes or shoulders to inform motorists that the bicyclists no longer has a separate space and will be sharing the main travel lane.

Bike Routes

Bike routes are not an actual facility type. A bike route is a designation of a facility, or collection of facilities, that links origins and destinations that have been improved for, or are considered preferable for, bicycle travel. Bike routes include a system of route signs that provide at least the following basic information:

- Destination of the route
- Distance to the route’s destination, and
- Direction of the route.

Bike routes can be designated in two ways: General Routes and Number Routes. General Routes are links tying specific origins to specific destinations. Number Routes form a network of bike routes that do not necessarily connect specific destinations, but serve as general travel routes through an area.

General Routes connect users to destinations within a community. Typical destinations include the following:

- Attraction Areas (i.e. libraries, parks, etc.)
- Neighborhood Areas (i.e. downtown, historic neighborhoods, etc.)
- Trail Networks or Trailheads (i.e. Lake Ontario Trail)
Bicycle Guide (the D11 series in the *MUTCD*) signs may be provided along designated bicycle routes to inform bicyclists of bicycle route direction changes and to confirm route direction, distance, and destination. Typical signs that convey the basic wayfinding information for general routes are shown in Figure 14-1. The *MUTCD* provides a number of different types of signs that can be used to provide guidance along bike routes.

Some communities implement bike routes with unique designations (numbers or names). These routes should be designated using Bike Route signs.

**Signing Roadways with Paved Shoulders**

The Local agencies may want to sign some roadways with paved shoulders to either guide bicyclists to destinations or to alert motorists to the presence of bicyclists.

If the subject roadway is along a designated bicycle route, then bike route guidance signs can be used to alert bicyclists to the presence of the interregional or state route.

**Bike Boulevards**

A bike boulevard is a local street or series of contiguous street segments that have been modified to provide enhanced accommodation as a through street for bicyclists while discouraging through automobile travel.

Bike boulevards often make use of low volume, very low speed local streets. Frequently, streets are made more accommodating for bicyclists by significantly keeping motorists’ speeds and volumes low. Often bike boulevards include bicycle friendly traffic calming treatments (speed pillows, mini traffic circles, chicanes with bike bypass lanes) to reduce speeds of motor vehicles along the roadway. While local motor vehicle traffic is maintained along the bike boulevard, motor vehicle traffic diverters may be installed at intersections to prevent through motor vehicle travel while having bypasses for bicyclists to continue on along the bike boulevard. Bike boulevards can be facilitated by connecting the ends of cul-de-sac roadways with shared use paths. At intersections the bicycle boulevard should be given priority over side streets.

Because of low motor vehicle speeds and volumes, bike lane markings are often not necessary along bike boulevards. SLMs may be used along bike boulevards. Alternatively, larger than normal bike symbols supplemented with the text BIKE BLVD have been used to designate bike boulevards.

In some communities, bike boulevard networks begin as a “one-off” system of bikeways. When a primary arterial roadway cannot be improved to a point where most cyclists feels safe and comfortable using the facility, a parallel roadway - often one street off the main road (or “one-off”) - may be
improved with bicycle facilities and traffic calming features to provide an enhanced cycling street. By paralleling the main road, the “one-off” network provides access to the businesses along the arterial using a pleasant cycling roadway. A “one-off” roadway can be improved in stages: initially with signage and shared lane markings and then into a bike boulevard by instituting more substantial features such as traffic calming and diverters.

Since bike boulevards typically serve as bike routes, wayfinding signage should be provided. This signage should include destination, direction, and distance (or travel time) information to attractors throughout the MARC region. Wayfinding adds to the utility of bike boulevards because it educates cyclists and would be cyclists that there are safe, comfortable ways of accessing the region by bike.

**Shared Use Paths**

Shared use paths are facilities separated from motor vehicle traffic by an open space of barrier and either within the highway right-of-way or an independent right-of-way. They are open to many different user types and are often used by bicyclists, pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Motor vehicles are not allowed on shared use paths. Most shared use paths are two-way facilities.

Shared use paths have design criteria for many of the same parameters as roadways. These include widths, horizontal clearances, design speed, horizontal alignment, stopping sight distance, cross slopes, grades, vertical clearance, drainage, and lighting. The AASHTO *Guide for the Development of Bicycle Facilities* should be consulted for design values.

The *MUTCD* provides the standards for signing, striping, and marking shared use paths. In most cases, the signs and markings use on shared use paths are smaller versions of those used on roadways.

Many shared use paths are separated from the roadway network. Consequently, street name signs should be provided to help users orient themselves to the roadway network. Wayfinding signs should be used on paths and to potential destinations along the path such as locations where users can access water fountains and restrooms. At trailheads and rest areas, the distance and direction to the next trail head should be posted.

Most shared use path projects will be paved. Asphalt and Portland cement concrete are the two most common surfaces for shared use paths. In areas where path use is expected to be primarily recreational, unpaved surfaces may be acceptable for shared use paths. Materials should be chosen to ensure the ADA requirements for a firm, stable, slip resistant surface are met. Even when meeting ADA criteria, some users such as in-line skaters, kick scooters, and skateboarders may be unable to use unpaved shared use paths.

The geometric and operational design of shared use paths is quite similar to that of roadways. However, additional considerations such as aesthetics, rest areas, amenities, and personal security are also important to ensure the maximum number of potential users are encouraged to use the path for utilitarian and recreational purposes.
Midblock Roadway Crossings

Midblock crossings are different from intersection crossings in three important ways: there are many more potential crossing locations at midblock than at intersections, motorists are less likely to expect pedestrians crossing at midblock, and pedestrians with visual impairments have fewer audible clues for determining the best time to cross. Each of these differences leads to important design considerations for midblock crossings:

- Make the crossing location convenient for pedestrians - Midblock crossings are provided in locations where crossings at intersections are not available or are inconvenient for pedestrians to use. Midblock crossings must be placed in convenient locations to encourage pedestrians to use them rather than other, more convenient, unmarked midblock locations.
- Make drivers aware of the crossing as they approach it - Drivers should be warned of the pedestrian crossing in advance of the crossing location, and the midblock crossing should be highly visible to approaching drivers. Drivers should have clear lines of sight to the crossing so that pedestrians at the crossing are visible. The approach to the crossing should encourage drivers to reduce their speeds prior to the crossing. Drivers should be given plenty of time to recognize the presence of a pedestrian and stop in advance of the crossing.
- Make pedestrians aware of the opportunity to cross - Provide aids for pedestrians with visual impairments to recognize the presence of a midblock crossing and the best opportunities for crossing. Auditory and tactile information should be provided for pedestrians with visual impairments since clues present at an intersection crossing are not always available at a midblock crossing (such as the sound of traffic stopping and starting).
- Make drivers and pedestrians aware of their responsibilities and obligations at the crossing and provide opportunities to meet these responsibilities/obligations - use MUTCD guidance to establish a legal crossing. Vehicle approach, pedestrian approach, and traffic control design should provide pedestrians with clear messages about when to cross, and drivers about where to yield. Where necessary, a refuge area should be provided for pedestrians to complete the crossing in stages. Traffic control devices can be used to create gaps in traffic for pedestrians to cross.

Pedestrian Approach (Sidewalk/Curb Line)

The pedestrian approach is the area near the crossing where pedestrians wait on the side of the roadway and away from traffic until they are able to cross. It is often part of the sidewalk, if the sidewalk is adjacent to the curb line, or an extension or spur of the sidewalk that provides a path from the sidewalk to the crossing, if the sidewalk is not immediately adjacent to the curb. The pedestrian approach design should accomplish the following:

- Make pedestrians, especially those with visual impairments, aware of the crossing location. In complex pedestrian environments, wayfinding signs may be appropriate to guide people to their desired destination. Auditory and tactile cues can be provided with traffic control devices adjacent to and in the sidewalk to direct pedestrians toward the crossing.
- Direct pedestrians to the proper location to activate a pedestrian signal (if present) and wait for an appropriate time to cross. Pedestrian-activated traffic control devices should be accessible to pedestrians with visual impairments and those using wheelchairs, scooters, and walkers. The approach design should make clear where pedestrians should stand while waiting to cross.
• Encourage pedestrians to cross at the marked crossing. The approach design should discourage pedestrians from crossing away from the marked crossing to the extent possible. The path to the crossing should be as direct and easy to navigate as possible.
• Keep pedestrians visible to approaching drivers and oncoming vehicles visible to pedestrians. Pedestrian furniture, traffic control devices, planters, and other objects should be located so they do not block pedestrians from the site of approaching drivers. Also, on-street parking should be restricted near the crossing so that parked vehicles do not limit sight lines.
• In areas with high volumes of pedestrians, there should be sufficient space for pedestrians to queue as they wait for an appropriate time to cross. Pedestrian storage should be designed to prevent crowds of pedestrians from spilling onto the roadway. Pedestrian storage area design can be especially important at bus stops, and care should be taken so that children can wait a safe distance from the roadway while waiting for a school bus.

Midblock curb extensions are a common and effective treatment at midblock locations and have many benefits.

Motorist Approach
As noted in the discussion about locating a midblock crossing, care should be taken to avoid locations where horizontal or vertical alignment of the roadway limit drivers’ sight distance, view of the pedestrian approach to the crossing, or view of the crossing itself. Consideration should be given to how trees, shrubs, poles, signs, and other objects along the roadside might limit a driver’s view of the crossing. On-street parking should be prohibited near the crossing using either signs with markings or physical barriers such as a curb extension, since a pedestrian who steps out into the road between parked cars can be blocked from the view of oncoming drivers.

Signing and markings on and along the motor vehicle approach to a midblock crossing should be designed in such a way as to make drivers aware of the crossing in time to notice and react to the presence of a pedestrian, and to enhance the visibility of the crossing. Advanced warning signs should indicate any special traffic control used at the pedestrian crossing. Refer to the AASHTO Guide for the Development of Bicycle Facilities for examples of midblock control treatments for shared use paths.

Traffic calming devices and other measures to prevent high vehicle speeds should be considered along routes with midblock pedestrian crossings. More than 80% of pedestrians die when struck by vehicles traveling at greater than 40 mph versus less than 10% when cars are traveling at 20 mph or slower. In addition, vehicles traveling at lower speeds require less distance to come to a complete stop when braking.
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MARC Regional Bikeways Plan
Effective Promotion and Marketing

A successful bicycle and pedestrian network depends on users being able to safely, appropriately and frequently utilize the network. To assist in creating an effective, safe bicycle and pedestrian network, outreach, education, and zoning enhancements will be necessary. Educating roadway users (both bicyclists and motorists) about the rules of the road and safe bicycling behavior is essential, while at the same time, encouraging more people to get out and ride their bikes.

The outreach and education recommendations in this section aim to increase the number of bicyclists and pedestrians while improving safe and appropriate behavior by bicyclists, motorists, and pedestrians. The network will attract users of different skill levels and ages, as well as provide opportunities for interaction with motorists and pedestrians. Education and outreach programs must consider all of these different user groups. The 1999 version of AASHTO’s *Guide for the Development of Bicycle Facilities* recommended that an education plan address the following four groups:

- Young bicyclists;
- Adult bicyclists;
- Parents of young bicyclists; and
- Motorists.

This Plan recommends that the following groups be addressed as well:

- Senior pedestrians and bicyclists;
- Low income pedestrians and bicyclists;
- Visiting pedestrians and bicyclists; and
- School-age pedestrians and bicyclists.

Important Informational Elements

It is important to make sure each group is addressed in multiple and suitable ways. For example, programs for young bicyclists should use age-appropriate curriculum and language to explain concepts and issues. In addition, the MARC region is home to people of many different ethnic backgrounds. Language barriers should be considered as educational materials are developed. MARC and local jurisdictions should seek partnerships that bridge cultural boundaries. Such partnerships would provide a valuable channel for distribution of educational materials and for general promotion of bicycling in underserved communities. MARC should ensure that all parts of the region, not only geographically, but also demographically, have equal access to active transportation information and facilities. Table 6 at the end of this Plan section provides a thorough summary of existing active transportation-related education and outreach programs and partnerships.

One of the key things to keep in mind when planning outreach and education efforts is not to “reinvent the wheel”. Many successful programs, campaigns and resources are available. Locally,
there are already many efforts underway. Other communities throughout the U.S. and Canada have already developed tools that can be adapted and modified for the MARC region. This adaptation is important in order to effectively localize the educational campaigns. Locally created campaigns that include materials with a local feel have been shown to have a more noticeable influence on motorist and bicyclist behaviors than generic FHWA-produced materials.

“1,152 pedestrians were treated in emergency rooms after being injured while using a cellphone or some other electronic device in 2010 — and the number had doubled since the year before.”

US Consumer Product Safety Commission

Bike and pedestrian education and outreach are vitally important in light of the growing number of distracted pedestrians. Much attention has rightly been focused on distracted drivers. But a recent National Highway Traffic Safety Administration reported that pedestrian fatalities rose by 4.2 percent in 2010 over the previous year, and injuries were up 19 percent, even though overall traffic deaths declined.

As we look around us every day, pedestrians are being distracted by their handheld devices. Researchers believe that the number of injured pedestrians is actually much higher than these results suggest, since police don’t always collect that data. A recent survey by Liberty Mutual suggests 60 percent of 1,000 people surveyed routinely read and send texts and emails, talk on their cell or smartphones, and listen to music while walking. Current trends, such as this, are important factors in designing bicycle/pedestrian safety, education and outreach programs. The framework for these recommendations was crafted with all this in mind.

Recommendations

Recommendation 1: Connect partners to maximize the effectiveness of existing resources, programs, and materials.

A list of potential partners has been developed, and their existing programs and partnerships have been inventoried to identify opportunities for new partnerships and enhanced use of resources. Some of these partners are already working together, but there are new partnerships that can be nurtured and developed, and new ways for existing educational materials to be used. Not all of the potential partners are specifically focused on bicycle/pedestrian-related issues, but may still be a useful partner for their ability to communicate with a certain part of the Rochester population. Some examples of education and outreach programs are suggested here:

1. Coordinate different organizations that offer bicycle rodeos for young bicyclists to see ways they can support each other and maximize existing resources.

2. Locate volunteers for bicycle rodeos and bicycle repair programs, and to distribute information about bicycling to young adults.
3. Coordinate safety education with the three school districts within the Region.

4. Learn from successful outreach and education examples in other active transportation-friendly communities. Many successful programs, campaigns and resources are already available. Other communities throughout the U.S. and Canada have already developed tools that can be adapted and modified for the MARC region.

5. May is National Bike Month - recognize those who commute by bike and encourage people to become new bicycle commuters or increase their trips by bike during the season when spring has sprung and new beginnings abound. This program features a month long calendar of events that offers organized rides for different ages and abilities, bike handling skills and maintenance workshops, and a Bike to Work Day Commuter Challenge. The program is most successful when led by a community-based organization with financial support from the region and greater business community.

6. Bicycle Ambassadors - A team of at least two ambassadors encourages an increase in bicycling by engaging the general public to answer questions about bicycling and teach bicycle skills and rules of the road. Ambassadors attend community-based events throughout peak cycling season to offer helmet fits, route planning, bike rodeos and commuting 101 workshops. Community members also may request an appearance by a team of ambassadors at businesses, schools or a conflict zone location along the bikeway system.

7. Bike Light Campaign - With shorter days, when it gets dark before commuters head home from the office, fall is a good time of year to remind cyclists that proper equipment is required when riding at night. A bike light campaign also offers the opportunity to introduce cyclists to bicycle shops and strengthen partnerships between the City and retailers. This program could offer discounts on bicycle headlights and rear red reflectors and lights. It is recommended that the campaign be rolled out in September with the return of university as well as K-12 students to school. The campaign should expire before peak holiday season when bike shops are busy and less interested in offering discounts.

8. League of American Bicyclists: Bicycle Friendly Community status - The Bicycle Friendly Community (BFC) program created by the League of American Bicyclists (LAB) offers the opportunity to be recognized for achievements in supporting bicycling for transportation and recreation. It also serves as a benchmark to identify improvements yet to be made.

9. League Certified Instructor training course scholarships - The League of American Bicyclists offers certification courses to train those interested in teaching others to ride their bike safely and legally as a form of transportation. League Certified Instructors (LCIs) are a valuable asset to the community and can offer a variety of workshops for adults lacking confidence to ride in traffic as well as children learning to ride for the first time. LCI training courses require a two and a half day commitment and are offered through the LAB. To facilitate a cadre of cyclists to become LCIs, this program coordinates with the LAB to schedule training course offerings in the community and provide scholarships.

10. Expand the Safe Routes to School (SRTS) program – SRTS is a national program that addresses barriers that inhibit students from walking and biking to school. The MARC and local
agencies should work with the different schools operating in region to consider how the program could be used to assess barriers at all local schools. Increasing the number of children that can safely walk and bicycle to school as well as protecting the safety of those that already do so requires a holistic approach. SRTS programs need to be cooperative efforts involving the entire region and the various schools or districts.

11. Conduct public safety announcements on following the rules of the road. For motorists, this campaign could address the need to look left prior to turning right, and provide clear passing space. For bicyclists, this campaign could address bicycle lights and lack of visibility when not riding in the road. For pedestrians, this campaign could address crossing at designated crossing facilities, and walking on the sidewalk in all seasons.

12. Walk Friendly Communities is a national recognition program developed to encourage counties, towns and cities across the U.S. to establish or recommit to a high priority for supporting safer walking environments. The WFC program will recognize communities that are working to improve a wide range of conditions related to walking, including safety, mobility, access, and comfort. [www.walkfriendly.org/](http://www.walkfriendly.org/)

13. Distribute a Bike Map – MARC has created a regional bike map that includes bicycle suitability ratings, extensive safety information for bicyclists, a listing of area bicycle shops and repair services, location of bicycle lockers and how to obtain access to use them, information about how to use the bike racks that are provided on all buses, and a listing of multi-use trails in the region. The map is free and can be provided upon request.

14. Institute a “Sunday Parkways” ride once per month - In Madison, WI, Sunday Parkways are times set aside on weekends and holidays for traffic-free biking and walking on a network of selected streets.

15. Create and build upon an active transportation wayfinding program that includes identification of routes and signing plans (destination, distance, direction) as well as assessments of potential improvements along the proposed routes.

16. Bicycle and Pedestrian Safety videos review safety rules using age appropriate videos for PreK-1, Grade 2-3, Grade 3-6 and three adult safety review videos. These videos could be incorporated into school district curriculum and shown at events.

17. Adapt Oregon’s program “Bike Wheels to Steering Wheels.” The program helps youth better understand the relationship between bicycle/pedestrian safety and motion, and ultimately gives students a better understanding of safety when traveling by all modes of transportation, in which the laws of physics are applied without exception. The concepts are learned through normal math, science, or physics curriculum in schools.
Other Possible Examples:

a. Commuter of the Year Contest - This contest recognizes those who choose to bike, walk, or ride transit. An aim is to encourage others to reduce their drive alone motor vehicle trips. Nominated by their peers, contestants may be employees, residents, or students in the community and could be asked to provide an inspirational story about their transportation choice and habits. Based on nominations, categories could recognize Youth, Student, Senior, and Family Commuters. Winners also should be encouraged to serve as role models and participate in events throughout the year to mentor others and help them set goals to reduce their drive alone trips.

b. Business Pool Bike Program - Offering employees the opportunity to check out and ride a bike to meetings, lunch or run errands is a great benefit. Pool bikes are a form of bike sharing where an employer manages a fleet of bikes for this purpose. This program offers subsidies for the purchase and on-going maintenance of bikes as part of an agreement to track use and achieve the goal of reducing vehicle miles traveled and greenhouse gases. Employees sign up, make reservations and log their trips using a web-based management tool.

c. Conduct pedestrian and bicycle counts on a seasonal basis to track whether there is an increase in pedestrian and bicycle activity, exploring new methods as suggested by the public and the League of American Bicyclists.

d. Bicycle Rodeo Kits - Children learning to ride should be confident with their bike-handling skills before riding in traffic. A Bike Rodeo is an interactive and controlled environment where cyclists practice a new skill at a series of stations. The number and difficulty of skills can be tailored based on attendance and number of instructors available to staff the event. This initiative will create a self-service bicycle rodeo kit that can be reserved by League Cycling Instructors (LCIs), Bike Ambassadors and community members. It contains instructions, diagrams and props necessary to host a bike rodeo. A programmatic collaboration with Monroe County Office of Traffic Safety should be explored.

e. Participate in an annual meeting of all bicycle/pedestrian planners and engineers in the region. An annual meeting should be held to allow local communities and organizations to communicate their plans and programs, as well as share best practice information.

f. AARP Network of Age-Friendly Communities Toolkit can be adapted by municipal and local governments, non-profit organizations, community partners and volunteers to guide and support age-friendly initiatives that make ‘Livable Communities” great places for all ages. www.aarp.org/livable-communities/network-age-friendly-communities

g. Identify properly enhanced visibility clothing for bicyclists and pedestrians, and advise the local active transportation community of the associated safety benefits.
h. As part of a larger roadway safety campaign, develop an educational campaign to eliminate bicycle and pedestrian fatalities. In Minnesota, “Toward Zero Deaths” is a statewide partnership involving federal, state, county and academic partners. The mission is to create a culture in which traffic fatalities and serious injuries are no longer acceptable through the integrated application of education, engineering, enforcement, and emergency medical and trauma services.

**Recommendation 2:** Appoint a public bicycle/pedestrian committee to promote non-motorized transportation and to actively engage with citizens, planning committees, and boards to expand commuting and recreational paths for walkers and cyclists.

- Promote safe routes to school, greenways and connected corridors with adjacent regions,
- Publish and maintain cycling and walking maps,
- Review proposed development for active transportation considerations,
- Recommend amenities to enhance safe walking and cycling.

**The 5 E’s:** Essential elements for communities to become great places for bicycling:

1. **Engineering:** Creating safe and convenient places to ride and park
2. **Education:** Giving people of all ages and abilities the skills and confidence to ride
3. **Encouragement:** Creating a strong bike culture that welcomes and celebrates bicycling
4. **Enforcement:** Ensuring safe roads for all users
5. **Evaluation & Planning:** Planning for bicycling as a safe and viable transportation option

(The League of American Bicyclists)

**Recommendation 3:** Coordinate an ongoing public information and enforcement campaign regarding safe sharing of the roadways for pedestrians, bicyclists and motorists.

**Pedestrians** - Law enforcement departments can take a leading role in improving public awareness of existing traffic laws and ordinances for motorists (e.g. obeying speed limits, yielding to pedestrians when turning, traffic signal compliance, and obeying drunk-driving laws) and pedestrians (e.g. crossing the street at legal crossings and obeying pedestrian signals). Many local law enforcement agencies have instituted annual pedestrian awareness weeks when they issue tickets to motorists who disregard pedestrian laws and warn pedestrians to follow the laws as well.

**Bicyclists** - A campaign should be designed keeping in mind the League of American Bicyclists’ recommendation that communities make connections between the bicycling community and law enforcement. Sporadic enforcement will not result in significant improvements to bicyclist behavior and
will likely result in resentment of law enforcement personnel. The behaviors to be targeted should be determined at the outset of the law enforcement campaign. The following behaviors should be targeted consistently:

- Riding at night without lights;
- Violating traffic signals;
- Riding on sidewalks; and
- Riding against traffic on the roadway.

These four behaviors were chosen for two reasons. First, they represent particularly hazardous behaviors which result in many crashes. Secondly, and very importantly, the enforcement of these behaviors is easy to justify to the public. When coupled with (and in fact preceded by) a large-scale education campaign, the public will understand the importance of the campaign and consequently will accept the enforcement activity.

In addition to the need to educate bicyclists, pedestrians, and motorists, some targeted training of law enforcement may also be appropriate. Some questions that could be covered in this training include:

- When is it okay for bicyclists to ‘claim the lane?’
- What width constitutes ‘traffic lanes too narrow for a bicycle and a vehicle to travel safely side-by-side within the lane?’
- Why is it important for a bicyclist to use headlamps and tail lamps?
- Why is riding against traffic such a problem?

By answering these and other similar questions, and discussing what infractions are most likely to lead to bike crashes, cities can encourage law enforcement to help promote bike safety by targeting those behaviors most likely to result in crashes. Some communities educate local law enforcement through the enforcement agency’s standing roll-call meetings, while others send officers to the League of American Bicyclists’ Traffic Skills 101 courses.

Program Effectiveness Measures

Program effectiveness measures can be used to determine if the recommended strategies meet their objectives, discover any areas that need change, justify funding, and provide guidance for similar programs.Baseline data is required prior to implementing recommendations. The region could observe the outcomes or contract with a consultant to measure effectiveness on their behalf. Observable outcomes include: number of crashes, injuries, and fatalities; behaviors; number of citations issued; number of people walking or bicycling; knowledge, opinions and attitudes; changes in organizational activity; traffic volumes; and traffic speeds. The effort to enforce the traffic laws as they relate to bicycle and pedestrian safety should be addressed in an overall, countywide, coordinated enforcement campaign. Targeted enforcement initiatives result in everyone following the rules of the road.
Encouraging Public Private Partnerships

These types of regulation standards stimulate private sector partnerships to provide end of trip provisions as well as increased choices of interesting and essential destinations for bikers and pedestrians. The two most influential end-of-trip provisions consistently cited by North Americans in nationally prominent opinion surveys as affecting their choice to bicycle for transportation are:

- Bicycle parking- availability and convenience, and
- Lockers and workplace showers for commuters.

Changes to applicable codes are recommended in the form of stronger incentives, rather than mandates. Recommended bicycle parking standards should formalize developers’ ability to reduce the number of required motor vehicle parking spaces by the number of bicycle parking spaces required; this strategy will become more of an incentive as gas prices continue to rise in the future.

Sample Bike Parking Requirements

Bicycle parking shall be provided at multi-family developments on two (2) or more acres, parks and recreation facilities, and commercial establishments according to the following standards:

1. All bicycle parking facilities shall be located on the same building site as the use for which such facilities serve and as close to the building entrance as possible without interfering with the flow of pedestrian or motor vehicle traffic. Bicycle and auto Parking Areas shall be separated by a physical barrier which shall be at a minimum a two (2) foot high wall, fence or berm; a ten (10) foot wide buffer; or a six (6) inch curb with four feet of buffer width to protect parked bicycles from damage by cars.

2. All bicycle parking facilities shall be clearly identified as bicycle parking. Where bicycle Parking Areas are not clearly visible to approaching cyclists, signs shall clearly indicate the location of the facilities. When possible, this facility should protect the bike from inclement weather including wind-driven rain. Bike parking shall be consistent with the surroundings in color and design and be incorporated whenever possible into buildings or street furniture design.

3. The number of bicycle spaces required is as follows:

<table>
<thead>
<tr>
<th>Type of Use</th>
<th>Minimum Number of Bicycle Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks and recreation facilities</td>
<td>1 space per 10 required vehicle parking spaces</td>
</tr>
<tr>
<td>Commercial uses</td>
<td>1 space per 25 required vehicle parking spaces</td>
</tr>
<tr>
<td>Multi-family development</td>
<td>1 space per 20 required vehicle parking spaces</td>
</tr>
</tbody>
</table>
4. Bicycle parking spaces may be provided as either bicycle racks or other storage facilities, provided that the following standards are met:
   a) Facilities shall be designed to allow each bicycle to be secured against theft;
   b) Facilities shall support the bike in a stable position without damage to wheels, frames, or components; Facilities shall be installed to resist removal;
   c) Facilities shall be installed to resist damage by rust, corrosion, or vandalism;
   d) Facilities shall accommodate a range of bicycle shapes and sizes and allow easy locking without interfering with adjacent bicycles;
   e) Facilities shall be located in convenient, highly-visible, active, well-lighted areas;
   f) Facilities shall include an aisle or space for bicycles to enter and leave parking racks. This aisle shall have a width of at least four (4) feet to the front or rear of a standard six (6) foot bicycle parked in the facility;
   g) Facilities shall provide safe access from the parking spaces to the right-of-way or bicycle lane;
   h) Facilities shall be located not to interfere with pedestrian or vehicular movement;
   i) Bicycle parking spaces shall have a minimum width of two (2) feet and minimum length of six (6) feet, and
   j) The Administrator shall be authorized to modify these standards where the facilities will be used predominately by bicycles having different space needs such as adult tricycles, or when another design (such as the provision of bike lockers) could serve the needs to an equal or greater degree

Furthermore, the design specification for bicycle parking should stipulate that the parking location be similar to that required for handicapped (motor vehicle) parking, and that the bicycle parking location be secure, covered, and at grade level. Workplace bicycle lockers, change and/or shower facilities are not generally being constructed. Thus there are two options to be considered: increase the incentives or mandate the facilities. The first option of offering more effective incentives is recommended; outlined herein are several approaches to this strategy.

Continued investment by MARC and local agencies in public bicycle transportation infrastructure can be complemented by developers and commercial property owners providing on-site showers and locker facilities for employees. There are a number of incentives that can be offered to the private sector developing and managing commercial properties; many of these incentives can be offered at little or no actual expense to MARC or local agencies.

Development Incentives
There are two phases in which the incentives can be effective: upon initial land development and during tenant build-out and/or remodeling or renovation. Among the compelling incentives for the construction of bicycle locker/changing/shower facilities at initial land development (or during site re-development) are:

- Trip generation (hence traffic impacts) reduction during traffic impact assessments (e.g., up to five percent of total trip generation, depending on land use);
- Floor area bonus (equal to the space taken up by the bicycle commuter facility) for those
districts and uses that specify maximum square footage;

- Reductions to required yard/setbacks (e.g., up to 20 percent for providing shower and locker facilities with capacity of serving up to five percent of employees);
- Administrative variances for more compact parking lot dimension(s); and
- Greenspace (for vehicle utilization area (VUA)) requirement reduction, (e.g., up to twenty times the building square footage dedicated to the bicycle facility).

Incentives for actions subsequent to initial development (i.e., tenant build-outs and internal building renovations) include ad valorem tax exclusion of at least two times the square footage of the building dedicated to the locker/changing/shower facility. Other incentives could include offsets to collected user fees.

As the MARC region transforms its transportation system in the public rights-of-way, a concomitant partnership by the private sector will ensure the effectiveness of the public initiative. The end result will be increased opportunities for the residents of the region to choose bicycling for, not only recreation, but also for commuting and travel. Their choice will enhance workplace productivity and employee health, which will in turn improve the economic well-being and overall quality of life in the MARC region.
Count Locations Introduction

The Kansas City area covers a wide geographic area with multiple city and county agencies as well as the Mid-America Regional Council (MARC) and two state Department of Transportation agencies including Kansas and Missouri. As of March 2014, these agencies are collecting a limited number of bicycle and pedestrian volume counts and most of these counts are being collected for project specific purposes. A few years ago, the MARC purchased mobile bicycle/pedestrian infrared counters, along with pneumatic (air-filled) tube counters, with the intention of developing a regional bicycle and pedestrian counting equipment loaner program. Since then, the MARC bicycle and pedestrian counters have been moved around to different locations by partner agency requests and are loaned out for the purpose of collecting short-duration counts on multi-use paths. This regional bicycle/pedestrian loaner equipment program is a good first of many more steps required to develop a comprehensive regional bicycle and pedestrian volume counting program.

Following the documented recommendations for developing a regional non-motorized data collection program (10 recommendations listed below) will ensure the MARC geographic area data partners, contributors and users a way to determine widespread use of multi-use paths and bike facilities throughout the region. Implementing these recommendation will allow for better quantification of safety mitigation performance measures, needs and requirements. Following these recommendations will also ensure implementation of a nationally accepted and regionally implemented credible, reliable, and statistically accurate non-motorized data collection program.

Regional Counting Program Advice and Recommendations

Standardized regional traffic monitoring (counting) programs requires two program elements to ensure, support, calculate, and provide accurate volume statistics. These program elements include short-duration counts and a continuous counting program and are documented throughout the Federal Highway Administrations (FHWA’s) Traffic Monitoring Guidebook (TMG) found at http://www.fhwa.dot.gov/policyinformation/tmguide/tmg_fhwa_pl_13_015.pdf. Without both continuous and short-duration counting program elements, reliable statistics such as the annual average daily bicycle (AADB) and the annual average daily pedestrian (AADP) cannot be calculated using national accepted statistical calculation methods.

The MARC data collection equipment is being used to collect short-duration counts throughout the Kansas City region. Currently there are no continuous counting bicycle and pedestrian stations in the MARC geographic region.

Recommendation #1 - It is recommended that the MARC geographic region develop a continuous counting bicycle and pedestrian counting program. Establishing and developing a continuous counting program in the MARC geographic region would provide the second traffic monitoring program element required to ensure, support, calculate and provide accurate volume statistics.

Developing a bicycle and pedestrian continuous volume counting program is a seven step process. These seven steps are outlined in the FHWA’s TMG Chapter 4 for non-motorized data collection program development.

Recommendation #2 – It is recommended the MARC geographic region follow the seven step process in developing a comprehensive non-motorized (bicycle and pedestrian) continuous and short-duration counting volume program. These steps are summarized in the numbered list below:
1. Review the existing continuous count program
2. Develop an inventory of available continuous count locations and equipment
3. Determine the traffic patterns to be monitored
4. Establish pattern and factor groups
5. Determine the appropriate number of continuous monitoring locations
6. Select specific count locations
7. Compute month-of-the-year (MOY), hour-of-the-day (HOD), and day-of-the-week (DOW) factors to use in annualizing short-duration counts

Recommendation #3 – Within the continuous count program, it is recommended that the MARC geographic area consider installing at least 3 to 5 continuous count stations per factor group. This recommendation is based on the TMG section 4.4.4 that recommends establishing and selecting the number of count locations based on what is feasible from a budgetary standpoint and ideally three to five continuous count stations for each factor group. Assigning continuous count stations to factor groups are a way of assigning similar types of continuous counting stations to a statistically homogenous cluster of sites that together accurately represent a factor group. One example of factor groups that might be defined in a non-motorized continuous count program could include a factor group designation of Urban, Rural, or Mixed. These factor group assignments are critical to establishing and calculating any annualized bicycle and pedestrian counting statistics. Once continuous count station factor groups are established, the factor groups provide a way of calculating individual factors for each group. When these individual factors have been calculated, it is necessary to assign all short-duration count stations to a factor group. The next step in calculating an annualized volume statistic for a short-duration count is to apply the factors from the assigned factor group to the raw count data collected at the short-duration count site.

Recommendation #4 - Since factor groups are not yet established in the MARC area, it is recommended the MARC area develop a Strategic Data Collection and Standardized Methods Plan. This plan could include coordinating and documenting a standardized method of collecting non-motorized data as well as establish methods for calculating traffic volume statistics such as the annual average daily bicycle or pedestrian traffic (AADB/AADP) statistics. This strategic plan should include documenting quality control and data handling business processes such as how to establish factor groups, what factors groups should be applied regionally, and how to use the factor group assignments to calculate non-motorized traffic statistics. How to evaluate automated reports including establishing data quality checking methods for data and reports generated directly from vendor’s software also needs to be included in the development of a strategic data collection and standardized methods plan.

Recommendation #5 - Once a regional Data Collection Plan is completed, and to ensure consistent and standardized data collection methods are implemented in the region, it is recommended a traffic data committee be established. MARC already has a group of stakeholders within the Kansas City area that are interested in contributing to the development of a regional non-motorized data collection program. Developing a traffic data committee should include the development of a website with data supplier/contributor/user members.

Recommendation #6 - Supplementing the development of a Strategic Data Collection and Standardized Methods Plan, it is recommended that a regional bicycle and pedestrian volume counting workshop be held with all potential agency stakeholders. This workshop should include
providing training and information to stakeholders such as counting for safety reasons, counting for maintenance and operations reasons, counting for engineering design/construction reasons, and counting data used for making better bicycle and pedestrian infrastructure investment decisions.

Recommendation #7 – It is recommended that a regional data wrangler be established. With a Strategic Data Collection Plan and a Traffic Data Committee in place, it will be necessary to coordinate, integrate, and evaluate the collection of bicycle and pedestrian volume data in the region. A ‘data wrangler’ is regional coordinator managing data for a specific geographic area that handles all the communication and coordination of gathering bicycle and pedestrian volume count data while promoting data integration and quality processes are implemented throughout the geographic area. Establishing a leader for the MARC region as the Traffic Data Wrangler would provide non-motorized data suppliers/contributors/users with a critical resource to contact about various aspects of a regional non-motorized data collection program. For example the Traffic Data Wrangler could provide information on how to (1) acquire count data, (2) provide quality control and quality assurance of data, (3) evaluate data for proper usage and application, and (4) provide answers to questions about how to standardize, integrate, and format data properly according the regional strategic data collection plan.

Recommendation #8 - After a Strategic Data Collection Plan has been developed, the regional Traffic Data Committee and Data Wrangler has been determined, and data is being collected from both continuous and short-duration counting stations; it is recommended that an analyses of the regional data be completed. This analysis would document the data findings from a regional perspective including identifying travel volume trends such as the volume range, peak hour, commuter/recreational/mixed pattern identification and any other data observations of significance. Analyses of the regional data should include defining data analyses methods that establish standardized and nationally/regionally accepted methods for ensuring the quality of data.

Recommendation #9 – Developing a regional data collection program should also include a number of research projects to ensure, support, and provide accurate bicycle and pedestrian volume statistics. Therefore it is recommended that a list of research projects be developed. Since establishing and developing non-motorized volume data programs is still relatively new to metropolitan planning organizations and non-motorized equipment is continuing to evolve and improve over time, a research projects list that is monitored and funded by the region is recommended. For example, pedestrian counting methodologies and data handling research should be one of the research projects established for the region. Another research project that should be considered is a data source/equipment evaluation project. This type of project would include evaluating various types of equipment for capturing bicycle and pedestrian traffic volumes.

Recommendation #10 – As referenced in recommendation #2 (following the seven step process for developing a count program) it is recommended that the MARC region establish site selection criteria for determining optimal locations within the region in which to install and collect data from continuous and short-duration counting stations. Establishing and documenting MARC area site selection criteria is critical for ensuring regional standardization for collecting non-motorized traffic data. Here is a subset of site selection criterion that could be established for the region:

1. Establish a minimum of 3 to 5 continuous counting sites per factor group
2. Collect data at sites that help to define factor groups in urban, rural, and mixed areas
3. Install 9 to 15 continuous counting stations per county
4. Install continuous counting locations on a variety of different types of facilities such as (1) multi-use paved trails, (2) on-street designated bicycle lanes, (3) sidewalks, etc.
This MARC area Regional Bikeway Plan provides a way of establishing the needs and requirements that can ultimately drive and help to establish a comprehensive and regional non-motorized data collection program. It is critical to understand that since the recommendations listed above have not been completed for the MARC area, the process of identifying specific short-duration and continuous counting locations throughout the existing, planned and proposed bikeways and trails network for this project cannot and is not based on the completion of these recommendations. Once the recommendations from above are completed, site specific location recommendations are likely to change.

**Recommended Site Selection – List of Assumptions**

In effort to advise and identify continuous and short-duration counting locations throughout the MARC region, a number of assumptions were made and are listed below:

1. Selection Criteria includes the need to collect data from potential factor groups that include (R) Rural, (U) Urban, (M) Mixed.
2. Selection Criteria includes the need to collect data from the following traffic patterns: recreational, commuter, and mixed (mix of recreational and commuter).
3. Selection Criteria includes the need to collect data from different types of facilities that include multi-use paths, on-street designated bike lanes, on-street (no bike lane designations), sidewalks, bridges, etc.
4. Manual counts will be conducted prior to installation in order to verify the presence of bicycle and/or pedestrian traffic at the sites recommended for counting.
5. Virtual and on-site evaluations for counting will be conducted prior to installation of counting equipment. This includes selecting the proper counting technology (manual, infrared, loop, and image detection) given the specific site conditions. For example, site conditions that are not recommended for infrared counting technology include sites that have overhead/underground power lines, pointing the counter toward vehicular traffic, and/or pointing the counter towards water.
6. There are no budget constraints on installing sites or purchasing equipment. This, of course, is not the case but sites recommended will have to be prioritized based on site selection criteria established for the MARC area and further prioritized according to the appropriate and available budgetary funding sources.
7. Existing counts will be evaluated and compared to recommended site locations.
8. Sites recommended be will evaluated for short-duration versus continuous counting installations through on-site evaluations.

**Identified Counting Locations**

Keeping the assumptions list in mind, a number of recommended continuous and short-duration counting locations are listed below. These counting locations include a county name, city name, type of facility, potential factor group assignment (Urban, Rural, Urban-Rural), and traffic pattern type (Commuter, Recreational, Mixed). Sites should be evaluated with an on-site visit before determining whether the site could serve as a continuous or short-duration count site so that the environmental conditions (pavement condition, overhead power lines, proximity to water, proximity to traffic, etc.) can be evaluated. Conducting on-site evaluations allows an agency to pinpoint the exact and precise global positioning system (GPS) location within the recommended textual location description. For example,
an entire corridor/bikeway/greenway might be recommended and an on-site evaluation reveals the exact location within the corridor/bikeway/greenway.

The Bicycle and Pedestrian Counting Location Recommendations Table below includes all the sites recommended for bicycle/pedestrian volume data collection consideration. Within these recommendations there are a total of 35 sites recommended. Recommendations were carefully selected so that a representative mix of possible travel trends would be represented. Therefore the recommendations in the table below includes a total of (9) commuter, (16) mixed, and (10) recreational possible traffic trend sites. Since there are no designated factor groups in the MARC geographic area, possible factor groups were assigned to the site locations. The MARC area needs to determine the factor group designations for the area so that all factor groups can be adequately represented. In the recommendations below, there are (5) Rural, (26) Urban, and (4) Urban-Rural sites. These are subject to change once the MARC area determines how to designate factor groups in the MARC area.

Also below is a map of the recommended locations. Green dots on the map represent the recommended counting locations (listed in the Bicycle and Pedestrian Counting Location Recommendations table) and red squares on the map represent a highlighted list of locations where MARC has already collected 4-hour counts using Miovision data collection devices. While the data already collected can be used for project specific needs, it does not meet the needs of developing a regional traffic data collection program that requires 24-hours (minimum of hourly consecutively) collected data. The Miovision product is capable of collecting longer durations of time but is client request and budget dependent. Ultimately Miovision data collection options could be cost prohibitive and the data handling is all outside of the client’s control. For places where the client can use no other technology, using Miovision might make sense when needing to collect short-duration counts but this technology is typically not suitable/financially feasible for a continuous counting station installations.
DATA COLLECTION SITE LOCATION RECOMMENDATIONS
<table>
<thead>
<tr>
<th>#</th>
<th>County</th>
<th>City</th>
<th>Facility Type / Name</th>
<th>Possible Factor Group</th>
<th>Possible Traffic Trend</th>
<th>Location</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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<td>Existing Bikeway</td>
<td>Urban</td>
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<td>Cass County, City of Harrisonville – Existing Bikeway – Urban / Mixed</td>
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<td>Clay County, City of Smithville – Crow’s Creek Park – Urban / Recreational</td>
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<td>Possible Traffic Trend</td>
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<td>#</td>
<td>County</td>
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<td>Facility Type / Name</td>
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<td>Stakeholder Input Recommendation - Michael Latka - City of Olathe Parks &amp; Rec Recommendation</td>
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MARC Regional Bikeways Plan
Bicycle Facilities Maintenance Overview

Maintenance of Bicycle Facilities
Maintenance of pavement surfaces is critical to safe and comfortable bicycling. Full width of the travel path and shoulders of bicycle facilities should be maintained. Maintenance of on-street bicycle facilities should be included with road maintenance.

Construction Measures for Preventative Maintenance
While regular maintenance activities will be required, some design treatments will help minimize maintenance needs:

- Place public utilities such as manhole covers and drainage grates outside of bikeways.
- Ensure that drainage grates, if located on or near a bikeway, have narrow openings and that the grate openings are placed perpendicular to the riding surface.
- Design of appropriate cross slopes should help to keep the riding surface clear of debris and water.

Vegetation encroaching into bikeways is both a nuisance and a problem. Many vegetative maintenance problems can be mitigated during the design and construction of the facility. The following are examples of vegetation control methods that may be done before or during construction.

- Place a tightly woven geotextile or landscape fabric under the asphalt pavement. This method may be chosen in sensitive areas where a nonselective herbicide is undesirable. Several brands of geotextiles are available. Many provide additional structural support for the asphalt paving as well, and may allow reduced pavement thickness.
- Control undesirable “volunteer” vegetation and noxious weeds during construction.
- Use root barriers where they are beneficial to prevent root intrusion to the path surface. Suckering plants are the ones most likely to come through the path surface.
- Place a non-selective herbicide under asphalt paving. All applications must be done according to label directions. This herbicide will prevent vegetative growth from penetrating the asphalt paving for a number of years. Caution is needed in applying non-selective herbicides. They may injure nearby trees if their root systems grow into the treated area.

In designing roadways, roads should be designed to allow for snow storage. The roadside should have adequate space to place plowed snow so that it does not block a shared use path that may be adjacent to the roadway. Separation between road and path allows for snow storage.
Maintenance Schedule
Several jurisdictional documents from around the country provide specifics on bikeway maintenance schedules. Examples of recommended maintenance tasks and frequencies for those tasks are provided in Table 1. It should be noted that of maintenance schedules used in the development of this table, only one was adopted as a standard in its community’s comprehensive plan (Arlington, Virginia). That document did not include all of the listed tasks. For many of those tasks it did list, the scheduled frequency was given as “As needed” and not tied to a given frequency.

Table 1 Recommended Maintenance Tasks Range of Recommended Frequencies

<table>
<thead>
<tr>
<th>Maintenance Task</th>
<th>Recommended Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Inspection</td>
<td>Monthly – twice per year</td>
</tr>
<tr>
<td>Sweep bikeways</td>
<td>Weekly – twice per year</td>
</tr>
<tr>
<td>Sign replacement</td>
<td>Annually – every ten years</td>
</tr>
<tr>
<td>Pavement marking replacement</td>
<td>Annually – every three years</td>
</tr>
<tr>
<td>Shoulder and mowing</td>
<td>Weekly</td>
</tr>
<tr>
<td>Weed control</td>
<td>Monthly – every six months</td>
</tr>
<tr>
<td>Tree/shrub trimming</td>
<td>Every four months – annually</td>
</tr>
<tr>
<td>Pruning</td>
<td>Annually – every four years</td>
</tr>
<tr>
<td>Pavement sealing, potholes</td>
<td>Every five years – every ten years</td>
</tr>
<tr>
<td>Path resurfacing</td>
<td>Every ten years – every twenty years</td>
</tr>
<tr>
<td>Maintain furniture</td>
<td>Biannually – annually</td>
</tr>
<tr>
<td>Litter removal</td>
<td>Weekly – every two months</td>
</tr>
</tbody>
</table>

Inspection of the entire system on a monthly basis would be reasonable. These inspections should include evaluations of the pathway surfaces, vegetation encroachments, debris on the pathways and general condition of signing and pavement markings. Additionally, nighttime evaluations of signing and
striping – particularly at crosswalks, should be performed as part of these inspections. Deficiencies should be noted and mitigating maintenance scheduled as they are noticed.

These inspections and resulting spot maintenance repairs/mitigation serve two primary purposes. First they will identify and address smaller maintenance concerns before they become larger and are more expensive to repair or a hazard to users. The monthly inspection will also provide the opportunity to evaluate the proposed maintenance schedule provided above. If, for instance, it is found that litter removal need only occur every two weeks, or that tree trimming should occur on a monthly basis, the regular schedule can be modified for future maintenance planning.

Snow and Ice
Snow and ice should not be allowed to accumulate on bikeways or sidewalks. On-street facilities should be cleared as the roadways are cleared. Smaller equipment may be instituted for off-street facility plowing. Monitor low points for potential ice accumulation and fix drainage issues accordingly. Remove ice accumulations from bikeways and sidewalks as quickly as possible to prevent accidents.

Vegetation
Once facilities are constructed, vegetation should be controlled to maintain sight lines and a regular schedule of mowing sodded areas should be established. Weed control and vegetation management must be included in the system maintenance program. Vegetation contributes greatly to the pathway users’ experience.

The most common vegetation related maintenance issue is groundcover (grass) encroaching onto the asphalt surface; it will initially narrow the usable asphalt surface and eventually result in the raveling of the pavement edges.

Roots can also damage pathway surfaces, causing heaving and cracking of the pavement. Ideally, the way an agency would address this problem is through some barrier that would prevent the grass or roots from ever growing over, or under, the surface of the trail. An example would be a product by DeepRoot®. Initial results have indicated that the application has been effective, and continued use is recommended.

Litter
Costs can be greatly reduced by using volunteers to perform simple routine maintenance such as litter pickup; this could be instituted as an Adopt-a-Path program. It is important to note that adequate City resources would need to be available and allocated to manage such volunteers. If such a program is not created, a regular maintenance schedule for litter cleanup on pathways should be maintained.

Maintenance of Signage
Signage on shared use paths can serve a variety of purposes: to inform users of their legal requirements (STOP), to provide warnings (LOW BRANCH), or to inform (RESTROOMS). All of these uses are important to make the pathway users’ experience safe and pleasant. Consequently, once placed, signs should be
replaced if they are damaged. Signs on shared use paths are also required to be retroreflective. Consequently, just as with roadway signs, pathway signs should be reviewed under night time conditions and replaced if no longer retroreflective.

**Reporting**
Bicycle facility users should report routine maintenance issues (those that do not present an immediate safety risk) to the relevant City’s Department of Public Works.

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