

NCHRP PROJECT 20-07 TASK 187

**UPDATING THE AASHTO GUIDE
FOR THE DEVELOPMENT OF BICYCLE FACILITIES**

APPENDIX

SURVEY OF AASHTO GUIDE USERS

**SUMMARY OF RESPONSES ON QUESTIONS CONCERNING
THE IMPORTANCE OF SELECTED PLANNING AND DESIGN TOPICS**

Survey of AASHTO *Bike Guide* Users
Summary of Responses to Questions Concerning
the Importance of Selected Planning and Design Topics

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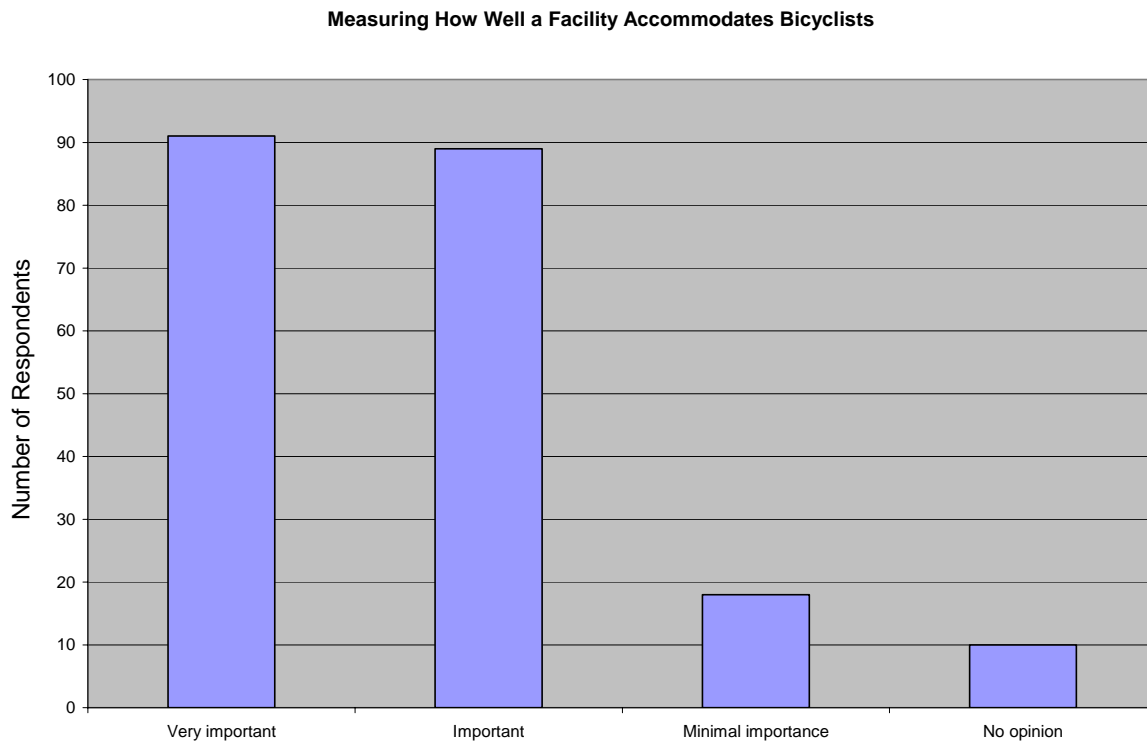


Figure 62. Measuring How Well a Facility Accommodates Bicyclists

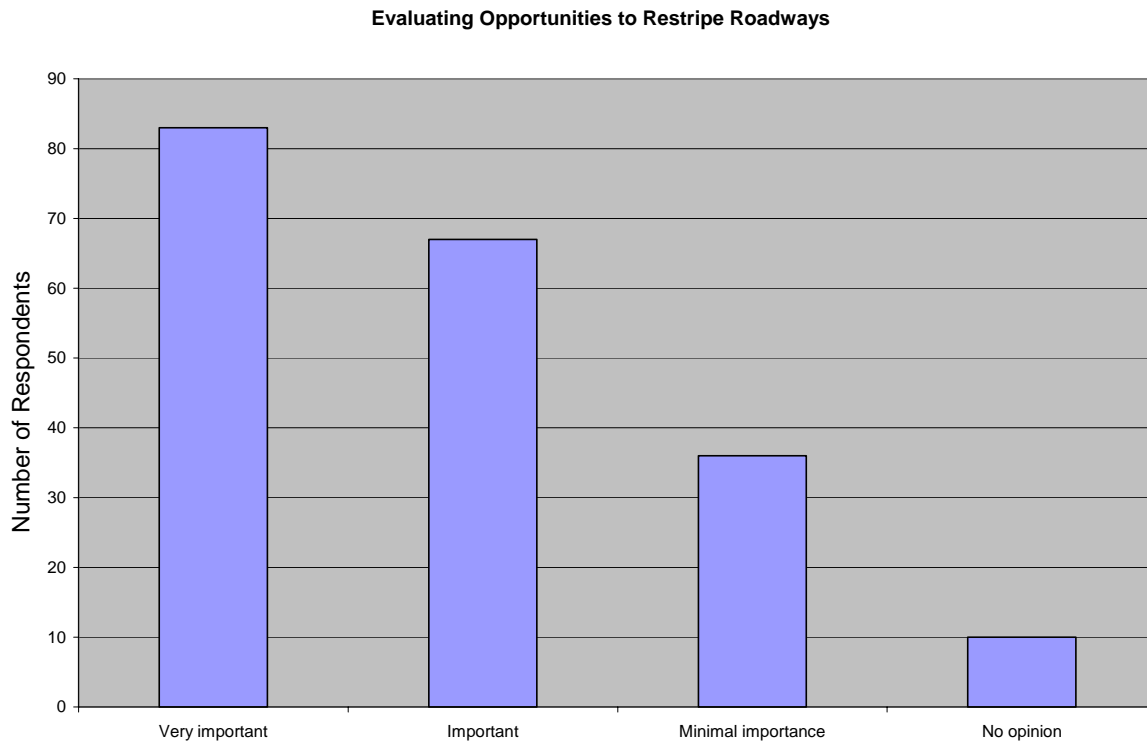


Figure 63. Evaluating Opportunities to Restripe Roadways

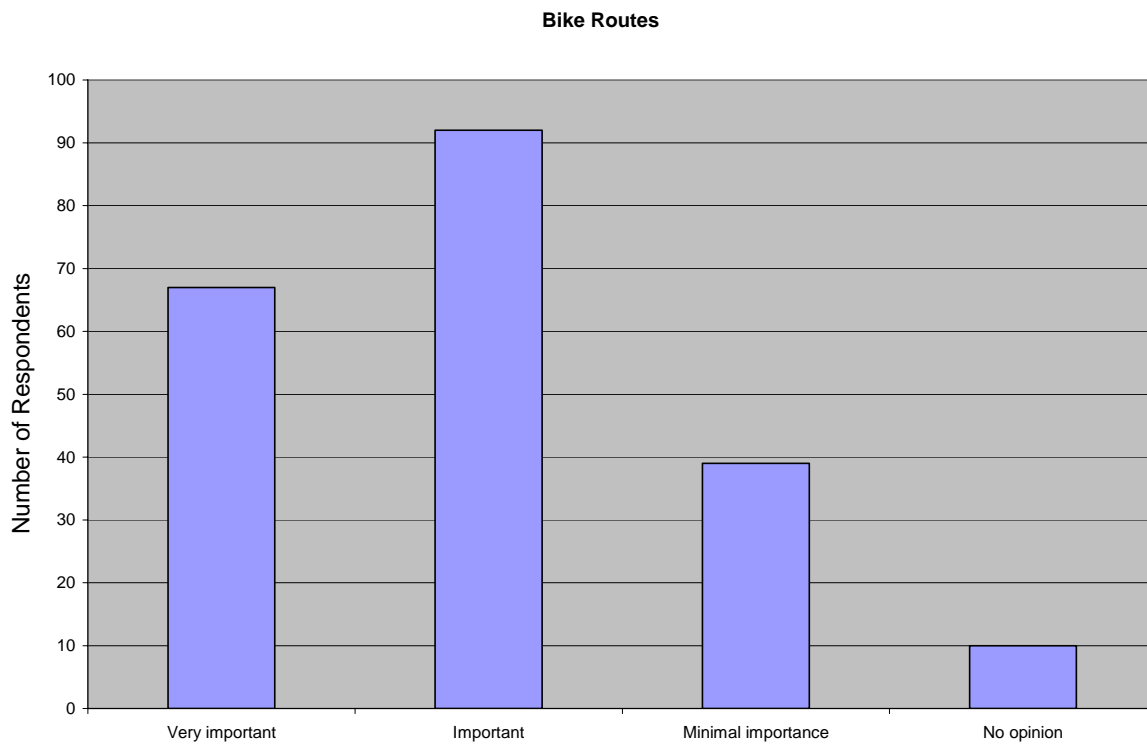


Figure 64. Bike Routes

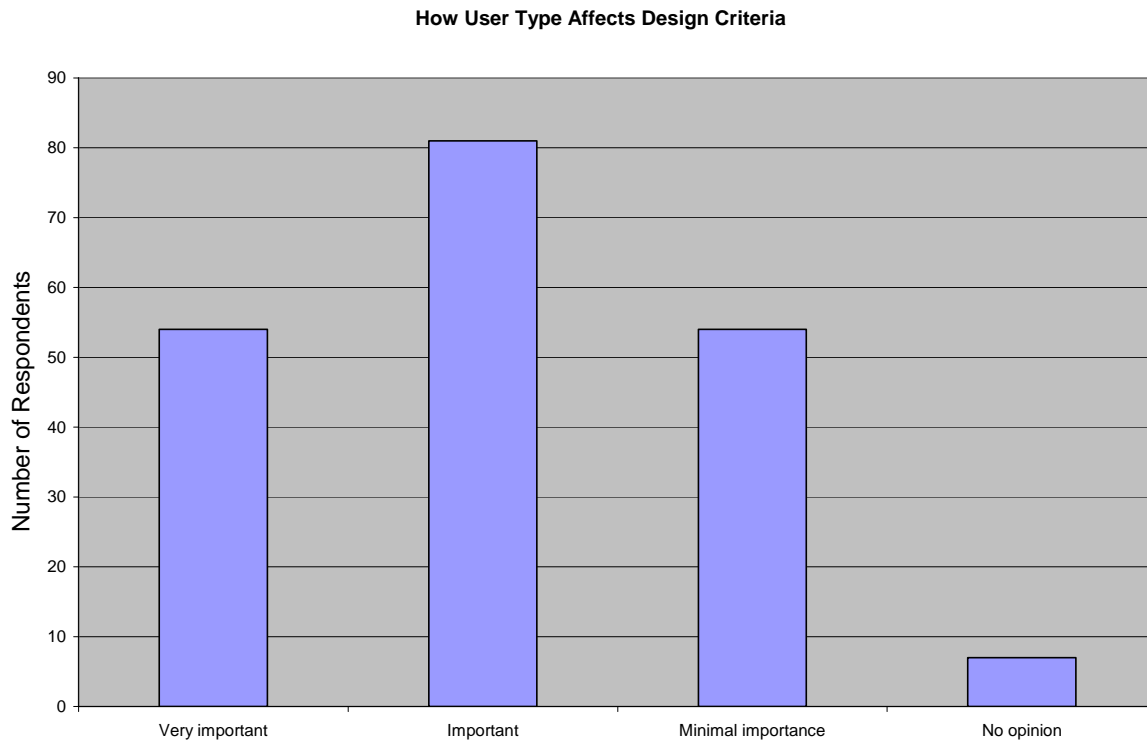


Figure 65. How User Type Affects Design Criteria

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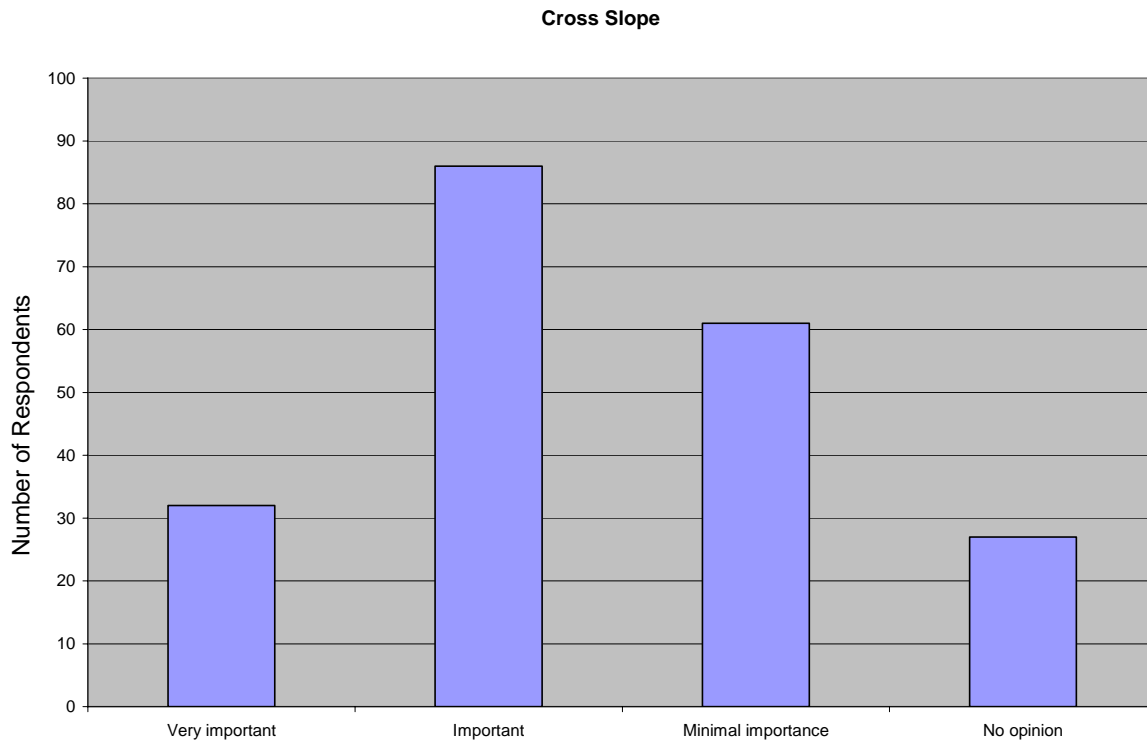


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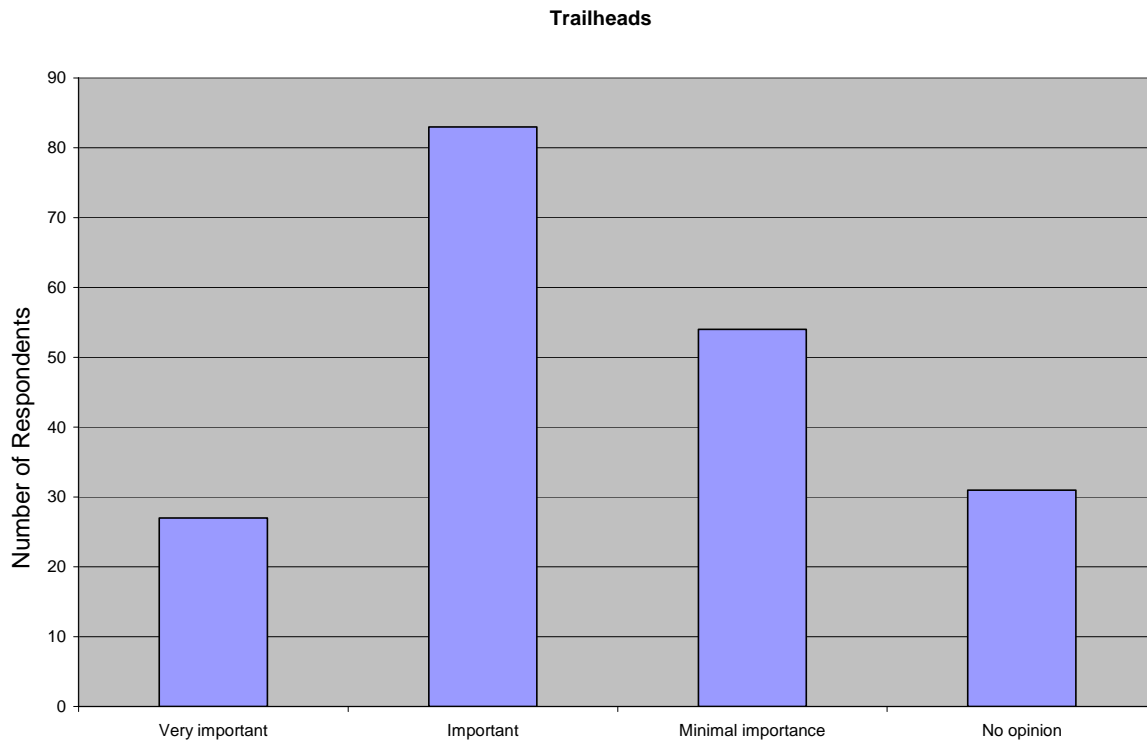


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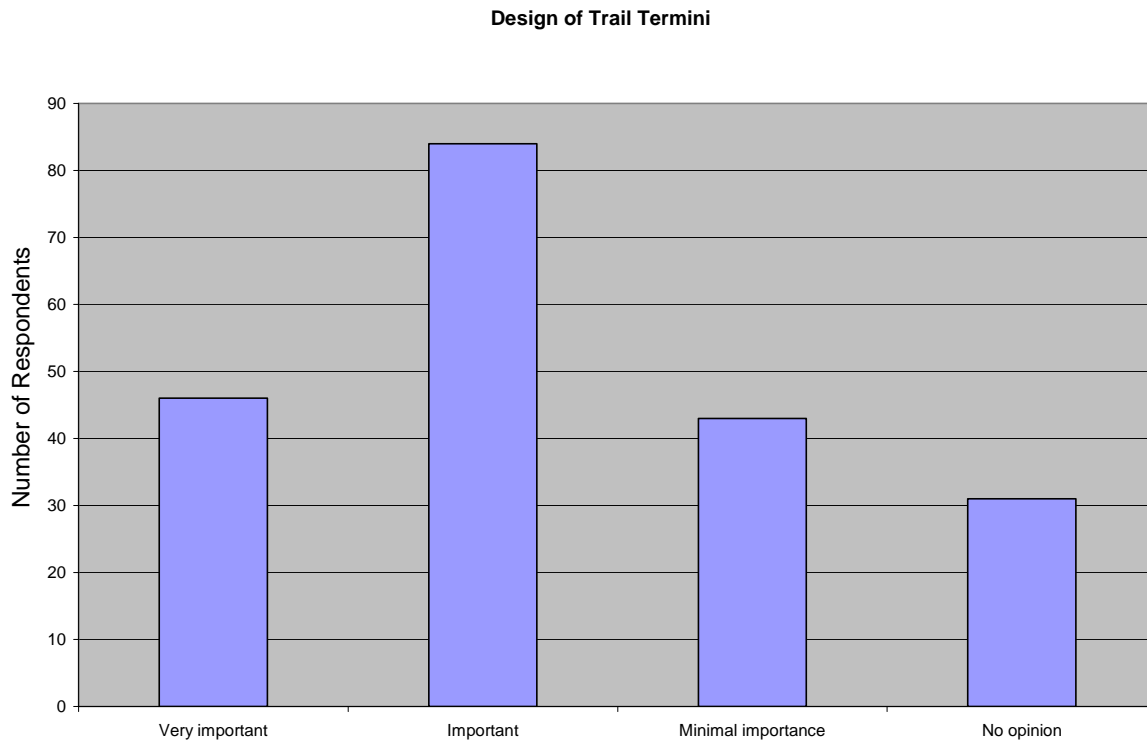


Figure 68. Design of Trail Termini

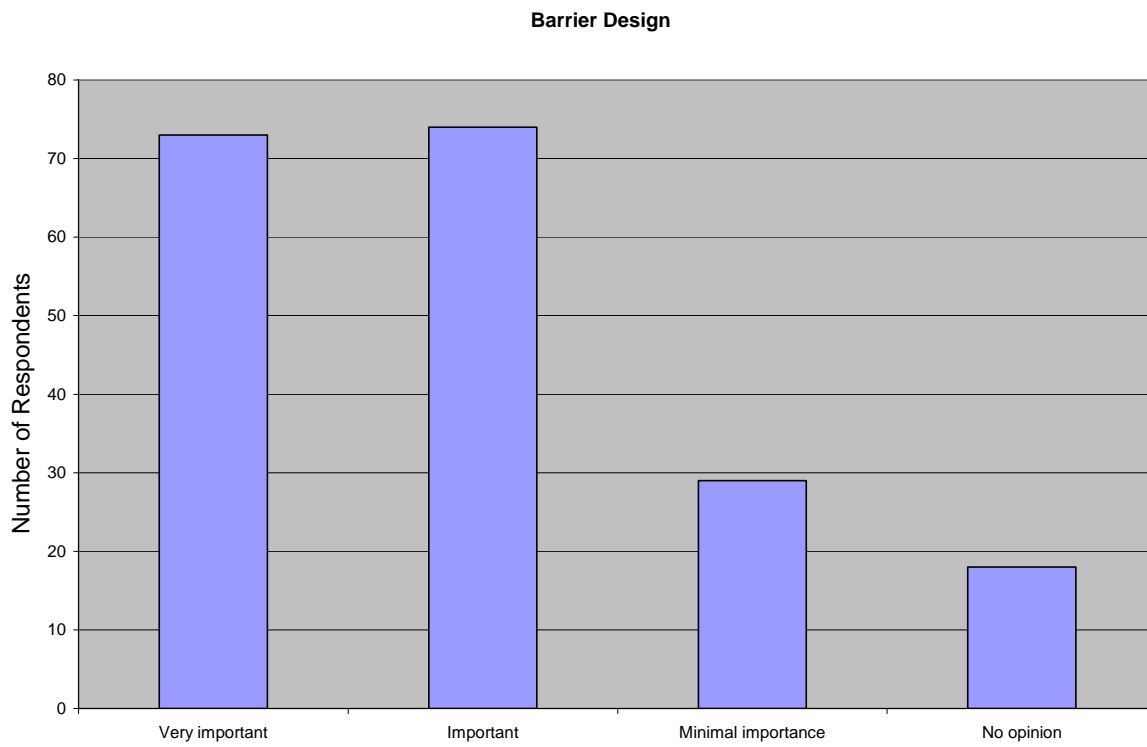


Figure 69. Barrier Design

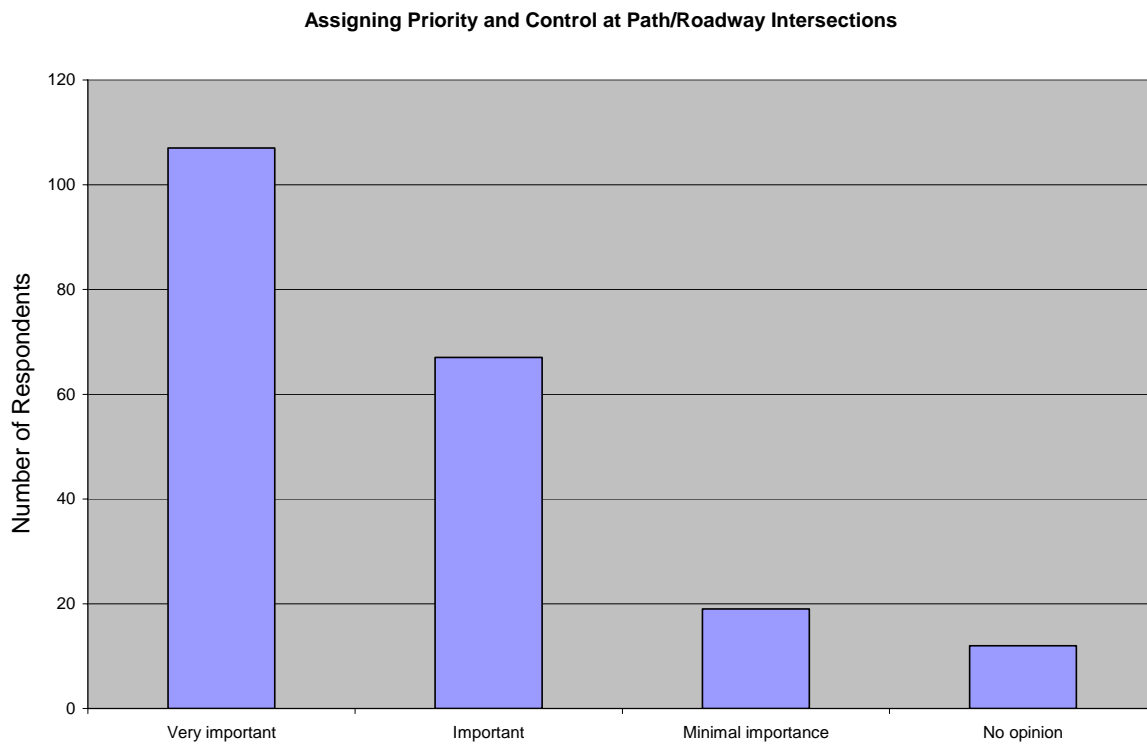


Figure 70. Assigning Priority and Control at Path/Roadway Intersections

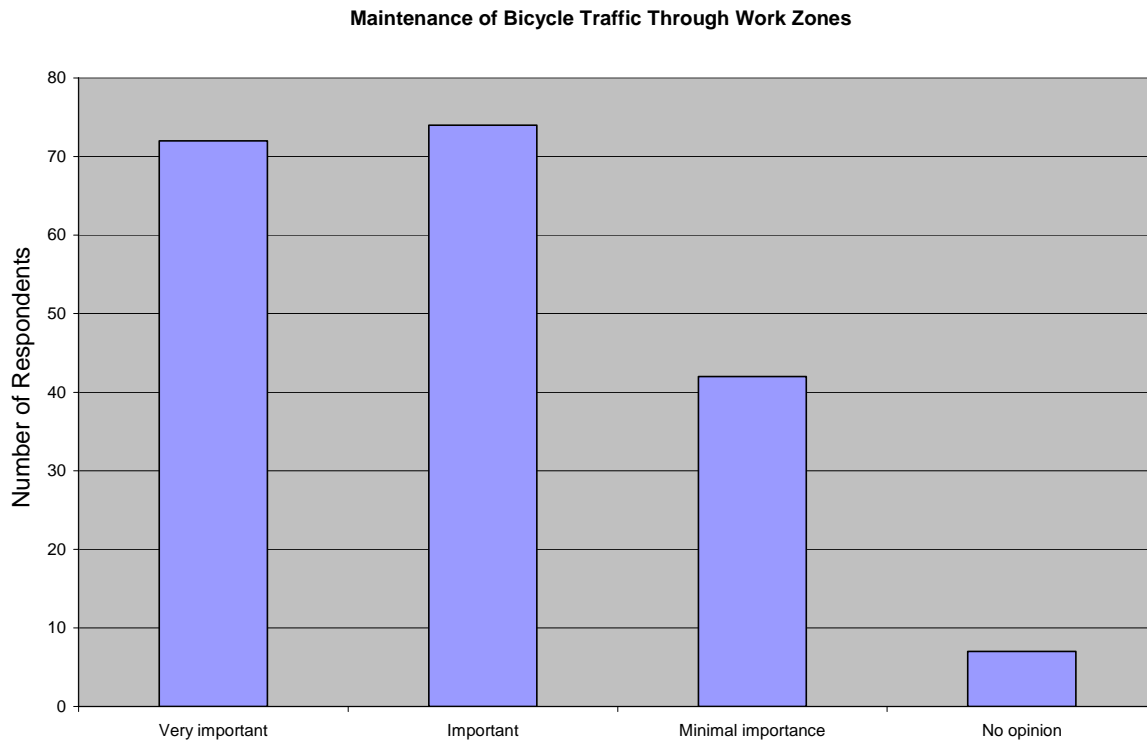


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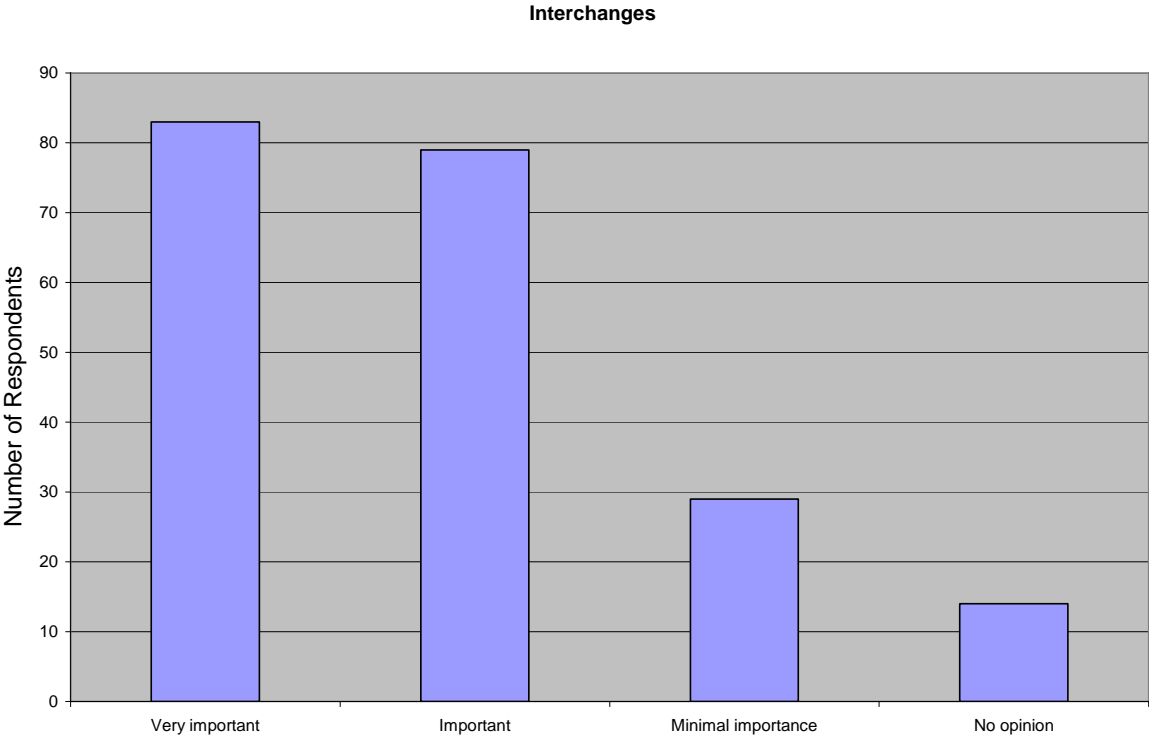


Figure 72. Interchanges

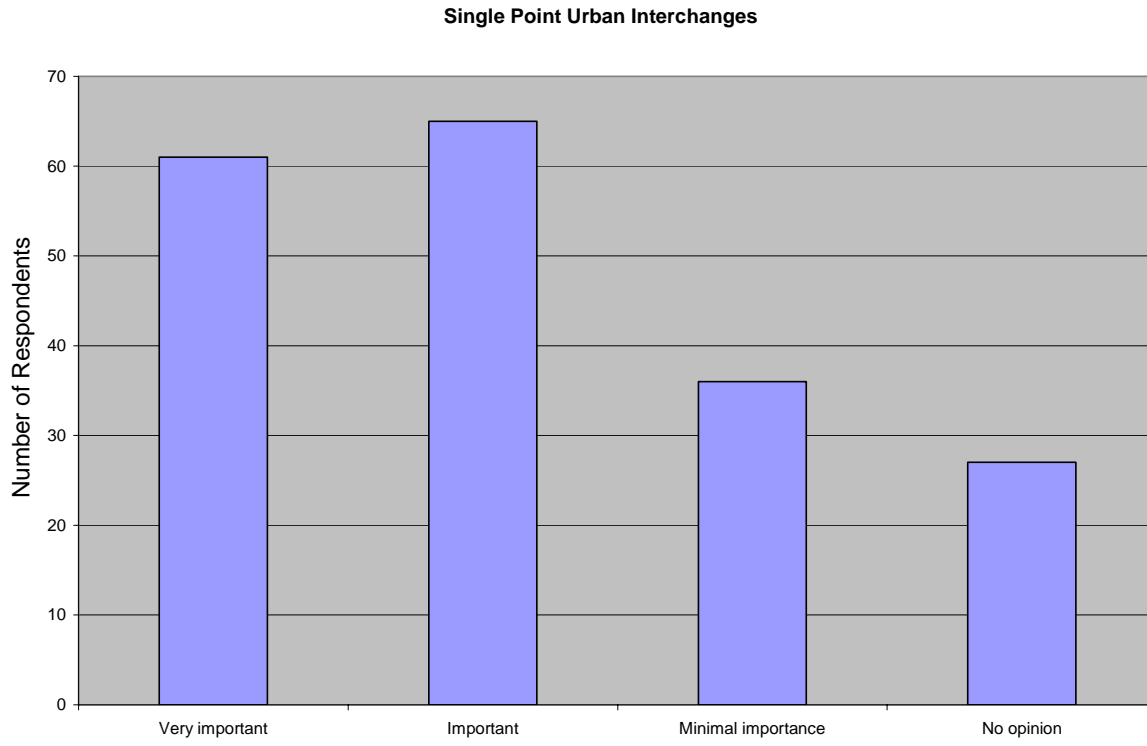


Figure 73. Single Point Urban Interchanges

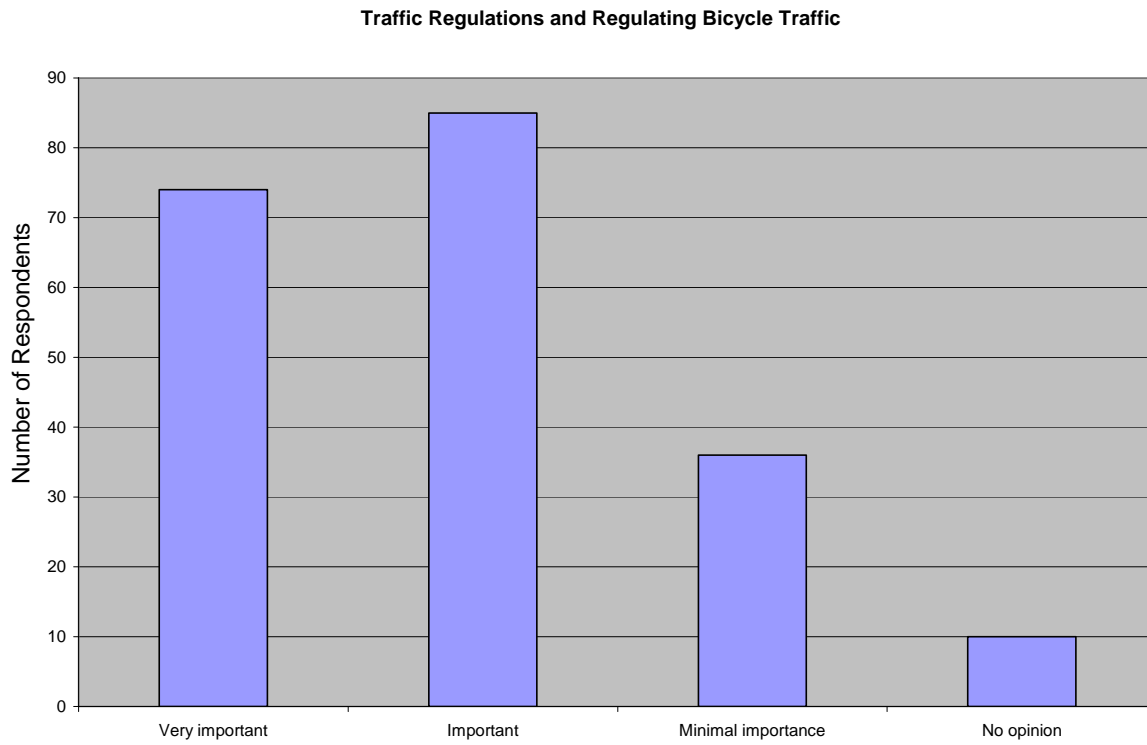


Figure 74. Traffic Regulations and Regulating Bicycle Traffic

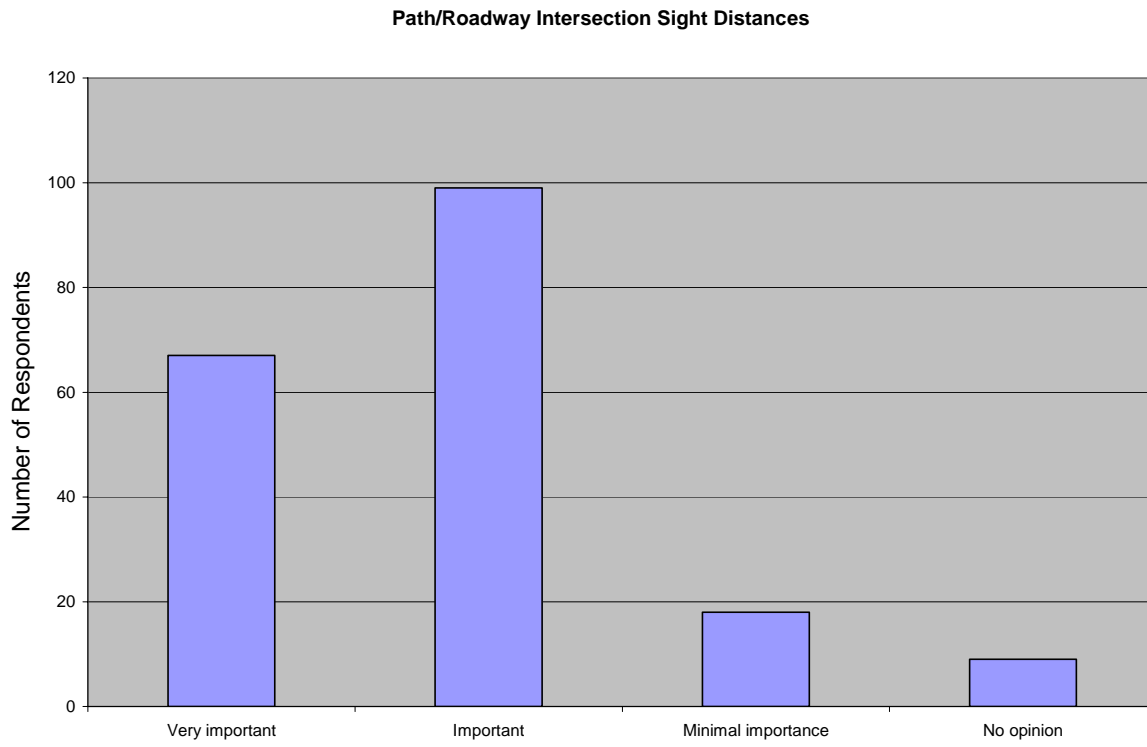


Figure 75. Path/Roadway Intersection Sight Distances

For each subject that is important or very important to you, please elaborate on why it is important and how the AASHTO Bike Guide should address it.

Many respondents stated they had addressed this question in previous sections.

Measuring accommodation will provide for future design. Restriping roads is an inexpensive means to accommodate bicycles and calm traffic. MO has at least three National Bicycle Trails that go through the state. We need as much guidance as possible on how to better accommodate cross-state bicyclists. Many engineers think all bicyclists need a shared use path.

Topics I checked as 'important' are ones about which I am often asked, or which are important for geometric or traffic device design, AND for which I would expect to find guidance in the Guide. Bike routes seem important for wayfinding on existing or future touring routes, such as East Coast Greenway. It would be helpful to include some guidance on trailhead planning & design--how can one estimate parking needs, choose locations, minimize conflicts with trail users?

These are prime factors in safety and usability of bicycle facilities.

A lot of public money has been spent on the construction of facilities intended for the use of cyclists without any evaluation of how they actually increase the safety, convenience and efficiency of cyclists. By my observations, the vast majority of such facilities would fail miserably by all three criteria. There is a need for objective evaluation, both before and after

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construction or implementation. Interfacing off-route trails and paths with the normal public road system is very important, analogous to freeway exits and entrances. The main problem with separate paths has always been at their intersections with public roads. The only efficient way of ensuring safe and effective cycling is through education. Cyclists must learn the rules of the road and how to apply them and the rules must be enforced equally to all road users. There is no need for regulations to be applied specifically to cyclists, except for those that apply to the specific characteristics of the bicycle itself. As for facility design, the vast majority of existing roads are perfectly suitable for bicycle use. The design and improvement of the public roads should always aim at avoiding and eliminating the freeway-type elements of the geometry: on ramps and off ramps, excessively large turning radii at corners, for example. If the road must accommodate high-speed unimpeded travel, provision should be made for adequate lane width in order to permit sharing with bicycle traffic. Road surfaces must be well maintained.

Traffic regulations--I don't know that the guide needs to comprehensively cover traffic regulations & their ramifications for bicyclists. But what it DOES cover it absolutely MUST get right. Also it is very important to, even briefly, cover some areas of safe bicycle practice (such as lane positioning at intersections, speed positioning rules, etc.) that affect design decisions and which non-bicyclist engineers & designers are likely to not understand (or, even worse, THINK they understand perfectly and yet not understand or misunderstand).

GBF should set a safe MINIMUM standard in all cases, and be required, not a 'guide'. Many facility designers do not ride, or ride poorly and have had no training. I need you to protect them from killing other cyclists, or me.

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There has been an increased employment of high-speed junction designs and very wide intersections with one or more right turn lanes appearing on urban and suburban roads that cyclists need to use to reach important destinations. The implications for roadway cycling should be discussed, with the possibility of discouraging such designs where they will have negative effects on roadway cyclists. There have been some local instances of police ticketing road cyclists for 'impeding traffic' on roads with narrow lanes. There have also been local efforts to prohibit or discourage roadway cycling on such roads. Oftentimes local authorities try to build or designate sidewalk-type facilities and kick cyclists off the roadways instead of improving the roadway section. The Guide should emphasize that cyclists have the right to use the roadways, especially important roads that serve important destinations, that protection of this right is essential to their safe travel to their destinations, and that roadway improvements are really passing facility improvements rather than bicycle facilities.

I work in a large cities bicycle program, where I focus on signed bike routes and ensuring bicycle facilities (read bike lanes) are included in other road projects. Therefore, I use the AASHTO guide as reference and support for my work.

Path/Roadway intersections are typically much the location where many of the crashes and conflicts on the path will take place. Emphasis should be provided on signing and pavement markings that will increase awareness for both bicyclists and motorists for these crossing conditions.

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1. All roadway and bikeway facilities (except for limited access roadways) should be measured by how well it accommodates bicyclists. 2. The creative restriping of roadways can be a quick and cheap way to gain a significant amount of bicycling facilities. 3. Designated bike routes - and a bike route map that is readily available to the public - are extremely important in a visitor serving community like Santa Barbara. 4. User type is very important. The type of bike facility we build to handle 14,000 trips per day at the University of California, Santa Barbara is very different from what is needed by a long distance touring cyclist riding the Pacific Coast Bike Route through rural areas of Santa Barbara County. 5. Barrier design is crucial. In particular, the inappropriate placement of bollards on bikepaths can cause more problems than they solve. 6. Interchanges - and roundabouts in particular - need to be addressed. 7. Single Point Urban Interchanges are not used in this area - yet. They probably will be at some point in the future and we need to know how to review them from a bicyclist safety standpoint. 8. Traffic regulations are important, but segregating the regulation of bicycle traffic is a bad idea. Bicycles are traffic. 9. Sight distances are crucial for bicyclists, particularly at two-way stop controlled intersections. Bikes cannot accelerate from a stop sign as fast as motor vehicles and need to see what through cross traffic is coming - at a distance.

Multimodalism is an important planning/development strategy in the Gainesville MPO.

Therefore, the adequacy of facilities to accommodate bicycle modes of travel is important.

Railing height should be consisted with AASHTO's Bridge Specifications. This is VERY important, because you have two AASHTO documents that state two different heights for the same thing.

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As a designer, each of the above subjects are important elements in the design of a safe facility and to minimize the potential for accidents.

Design - most of users are civil engineers and designers building roads and trails. Striping - particularly important in noting how to restripe after an overlay job. Trailheads - Addition of info on this subject would be useful. MPT of bikes through work zones - Unaddressed and needed. Path/Roadway Intersection sight distances - useful.

Very little consideration is usually given during design or construction as to how to handle bike traffic during construction - should be emphasized

The ones that I picked as important are subjects that come up at design review meetings.

The areas marked important are necessary for the safety of users. Detour signs closing commuter paths and routes should be direct. The detour should be paved soon if not completely paved when the detour goes into effect. The conflicts among AASHTO publications regarding minimum railing heights always seem to cause problems on our bridge projects. We will continue to require 54" {137.2 cm} railings until the Bridge Spec's say otherwise.

I feel that this publication is important in the areas checked due to its comprehensive approach. It is very useful in the planning area but more specifics are needed as you go through the design arena and I don't think it is the purpose of this publication to do that. It does its job well

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Restripe roadways - money is tight and most projects can't afford ROW so we need to make due with what we have curb to curb. Bike routes - we need to develop a good infrastructure to get people to make the switch to an alternative mode.

Measuring How Well a Facility Accommodates Bicyclists - objective measurements are very important because of the huge range of subjectivity and bicycling experience of agency staff and the public as a whole. It also brings bike planning more into the mainstream. I'm a big advocate of Bicycle Level of Service and other bike/ped measures. Assigning Priority and Control at Path/Roadway Intersections - stop signs are very much overused on trails. Recommend yields more widely, and include selection tables.

SPIs tend not take bicyclists into account; they travel slower thru the intersection and frequently will not know the light has gone red. Work Zones: In our area, sometimes bikeable shoulders or bike lanes are closed due to maintenance. In this case it would be good if enough of the adjacent lane was blocked off to turn it into a bike lane width.

The AASHTO Bike Guide is the bible of design and planning. We need to focus on the safety and movement of bicyclists so when reconstruction or new designs take place, bicyclists and pedestrians are thought of just as importantly as the motorized vehicle drivers. We also need to be able to create designs that give people transportation options -- the Bike Guide plays a big role in those designs.

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more barriers details and figures

Interchanges/Single Point Interchanges - Of greater value is expressing the need for accommodation on the local road at interchanges and how to best provide that accommodation in high traffic/high conflict areas. How well a facility accommodates bicycles - This is the most important aspect as an advocate and facility planner. Greater information is needed to effectively coordinate with transportation planners and engineers existing roadway evaluation and on how to determine what level of service is needed on new roadway projects. User type to facility type - Common practice to design one facility to the lowest ability level. Thus, advanced on road users are shut out of the solution process. Emphasis on multiple user-type accommodation needed.

Work Zones - This is non-existent in Kansas City area and is needed. Please address stronger.

Detours of 2-3 miles {3.1-4.8 kilometers} of bicyclists are not practical for bicyclists and unrealistic for pedestrians, but the motor vehicle detour is typically all that gets signed. Priority at Intersections - The most vulnerable, anticipated user should be given priority and first consideration in any facility design, whether it's a road or path. SO pedestrians first, bicyclists second and motorists third. Traffic Regulations - Hard to cross facility design and regulation in one booklet, but is a major issue for on-road bicyclists. The 4 E's should be stressed - Education, Encouragement, Engineering & Enforcement. Without all 4, FHWA's goal of increasing bicycle usage is going to be extremely difficult. Sight Distances - Safety has to coincide with accommodation. Dangerous facilities, such as wide sidewalks, do not result in true accommodation if they are avoided due to inherent dangers.

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In the areas where I work with planners, the tendency to think of bicyclists as second-class users of the road network is common. AASHTO's reluctance to use a bicycle level of service approach tends to affirm that tendency. It sends the message that bicyclists aren't important enough to calculate LOS. While I would like some organization to deal with the ways that laws and regulations are applied to cyclists, I'm not sure that the AASHTO guide is the appropriate place. I do appreciate the brief comments the guide makes on this topic.

We are building more SPUI in the urban areas, and building more roundabouts. Our state prohibits bicycles on Interstates and Freeways (expwys with no at-grade crossings), but we still have problems just getting bicycle traffic across these interchanges, especially those with ramp loops, & directional interchanges.

The majority of these subject areas influence structure and bridge design from the roadway leading up to the bridge to the usage (including safety e.g. work zone passage) to the physical characteristics i.e. cross slope, barrier design, sight distances etc. of the bridge itself

Accommodation of bicyclists in work zones is important as such areas become severe obstacles to bicycling. We are initiating research on this topic.

Measuring: It's often assumed that the mere existence of a bicycle-specific optimization is enough. But the quality of such optimizations varies wildly, from useful to neutral to harmful to fatal. It's critical that facilities be honestly evaluated, and that bad facilities (even those with the best of intentions) be eradicated. Bike Routes: A Bike Route designation is currently not very

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meaningful. Instead, the particular qualities that make roads pleasant and useful, or unpleasant and challenging, for cycling should be discussed. Interchanges: Interchanges often appear on important roads and can be tricky for a cyclist to get across. More guidance is needed for designing interchanges that are not cyclist-hostile. Regulations: Traffic laws are often biased against cyclists. Laws that require the use of sidepaths or that require the use of the edge of the roadway need to be repealed, allowing cyclists the same right to the road as any other user.

Construction is a constant aggravation in Chicago. I would like to see recommendations on accommodating cyclists through fluctuating work zones. This would include lane designations and detour signage.

More example treatments for high volume urban intersections

Measuring How Well a Facility Accommodates Bicyclists is important because the guide will be used by agencies to better understand how existing roadways accommodate cyclists and thereby (along with user demand data) form the basis for a community improvement program. The Guide will often be cited as the reference in arbitrating which of two or more competing designs should be chosen. Evaluating Opportunities to Restripe Roadways - We use this frequently to insert bicycle facilities onto roads originally built without such consideration. Knowing what lessened motor vehicle lanes would generally be tolerable, and under what conditions (speed, truck %-age, etc) would provide the framework to achieve more bike facilities in this manner. How User Type Affects Design Criteria - This concept is still of major value to those persons new to bicycle facility design. The current ABC paradigm is still useful and relevant. Cross

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Slope - This concept, which is quite familiar to pedestrian facility designers for ADA ramifications, must be given prominent treatment in the guide for its applicability on shared use

(pedestrian/bicyclist) facilities. Barrier Design - An area rife with possibilities for confusion due to the conflicting information from the AASHTO Bridge folks and the current Bicycle

Guide, particularly as to barrier height. It also would be good to have a good

description/explanation of what is meant on page 35 by a 'suitable barrier' in the context of the necessary separator between the roadway and a shared use path. Also, here it would be good to explain better how it is measured (shoulder edge and edge of travelway of shared use path?).

Assigning Priority and Control at Path/Roadway Intersections - Continuing the dispelling of the notion that the non-motorized facility must always be stopped, when it may be the higher volume facility and ought to be allowed to be the through facility. Maintenance of Bicycle Traffic

Through Work Zones - This is an area where there is nothing I can find in the current Guide, but which must be included for the bicycle to be considered a serious transportation mode in

community design. Interchanges - This is an area where the most difficulty in accommodating bicycle traffic is found-where motor vehicle traffic is also most complex. It would be good to see it emphasized that for the bicycle to work as good comprehensive community transportation,

it must be able to get through interchanges. Single Point Urban Interchanges - The unique difficulties of SPUIs, particularly as affects signal clearance timings when the designer properly accommodates a slow-moving mode such as the bicycle through an unusually wide intersection.

Traffic Regulations and Regulating Bicycle Traffic - Without a thorough understanding of how the bicyclist must interact with other traffic in accordance with typical laws, it is not possible to design adequate facilities. A section on how certain 'faults and omissions' in a particular state or municipal code or ordinance can be detrimental to bicyclist safety and accommodation would be

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useful. (e.g., why a legal permission to 'take the lane' when lane widths are substandard would be helpful.) Path/Roadway Intersection Sight Distances - This is a most important factor to consider in permitting pathways to cross our existing roadway system. Without strong language regarding sight distances appropriate and needed for each speed level, permitting encroachments would be much more difficult.

The guide needs to go into much greater detail as to how cyclists navigate through various types of intersections and the legal consequences.

Roadway restriping - Using BLOS to evaluate Path-Roadway intersections - signalization and/or warning lights, intersection markings. Maintenance - Signs, temporary bike lane

Each is essential for design of safe, user-friendly facilities.

They are all issues that need to be addressed in the design of facilities

Georgia DOT uses the AASHTO guide as its design guide for bike facilities -- we do not have our own GDOT guide or policy. Therefore everything in the guide related to design standards, widths, slopes, etc is very important to us, especially for bike lanes, shoulders and paths.

For each subject that I marked as important or very important please provide a section specific to the issue related to that subject.

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Type 2 barriers are a diversion fall hazard. Fencing must be smooth as cyclists will fall or brush against it. Interchanges with paths do not address conflicts between counterflow cyclists and motorists.

'Measuring' is a key word on assessing facilities. Things often generate into semantics when applying AASHTO standards. Clarifying what key terms mean would be very helpful.

Intersection termini are high conflict areas. Specifics on paths terminating at intersections would help. Roundabouts are emerging all over. Additional guidelines on safe design/use/education would be helpful.

The guide should make it clear that 10 foot {3 m} travel lanes for motor vehicles are acceptable in the AASHTO green book.

First and foremost the bicyclist's SAFETY must be the overriding concern. Well-designed facilities and respect for cyclists will do much to foster cycling in the United States.

Each subject area is important because bicycle facility design needs to be institutionalized into transportation planning. Whether on-road or off the facility needs to be safe. On road facilities need to encourage riders to obey the same rules and take the same actions as motorists.

Transition zones from off-road to on-road are often tricky and more could be done to plan for them.

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State and local highway agencies are very concerned with documentation of design and research behind that documentation. The design elements interfacing with motor traffic are very important. Safety for interface with other users is also important.

Every subject that deals with design is important to expanding our bicycle facilities and giving designers the information they need to incorporate facilities in a multi-modal fashion. Wording needs to be 'beefed up' such as 'shall' instead of 'should'. Engineers (designers) pay more attention when the word 'Shall' is used. The very use of 'Guidelines' in the title cause problems in that people used it to mean that they have a choice any whether to incorporate and use certain design criteria in their plans.

Our agency is striving to enhance our design guidance for modern roundabouts. It would therefore be very beneficial to us if the new AASHTO Bike Manual were to enhance its discussion of roundabouts with any and all available updated bicycle design guidance.

All of these items affect the desirability and safety of people cycling in various circumstances. Some, such as barrier design, maybe should be briefly discussed and cross reference more detailed guidance for that purpose.

To maintain and promote safety for all users in the cycling environment (motorized as well as nonmotorized), comfort, convenience and attractiveness for cyclist of bike route systems and individual facilities. This is important to current users and cyclists as well as the larger issue of getting more people to cycle more often for the full diversity of trip types and purposes.

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Generally, the current level of conciseness in the Guide is quite good -- it just needs some of the edits and additions such as those I have suggested. Please note that I bring to this update-review of the Guide over 40 years as a traffic engineer and multi-modal transportation planning and functional design practitioner, including consulting, university instruction, and research in planning, design, traffic operations, and design-safety-economics-aesthetics-environmental trade-offs for both new construction and the more challenging retrofitting-improvement of ground transport facilities. I am a B+ rider who began significant adult cycling at age 50, and I cycle year-round about 5,000 miles for all trip purposes, on-street and on road/on-rural-freeway mainly -- and trails as well in both urban and rural settings, and in night/darkness/reduced visibility-periods as well as daylight cycling. Dennis Neuzil, D.Eng., P.E.

Restriping roadways is often the least expensive option that we recommend. Movement priorities at intersections are vitally important. This is an area that needs improvement. Interchanges can be barriers to bicycle travel. Single Point Urban Interchanges are actually an impediment to safe bicycle travel. Most cyclists do not like to approach these in highly traveled areas. We have also seen that they actually discourage pedestrian movements across the interchange.

Measuring how well a facility accommodates bicyclists: As our agency works to establish cost benefit analysis as part of its decision making process this type of information could be helpful in determining an appropriate and cost effective structure. Bike Route and evaluating opportunities to restripe: The topics are important and inter related; current experience suggests that bike routes are viewed as a phenomenon that must occur separate from the roadway and

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thereby equaling great expense when the reality is there are many low cost opportunities for accommodation using existing infrastructure, there just needs to be better information about when to use what tool. Trailheads and termini: While reasonably well discussed already it is important to improve so that trail systems remain legible and safety is maintained as cyclists enter and exit trail systems. Interchanges and SPDI: Within our state the use of urban interchanges has exploded and they are often being built without appropriate thought to cyclists or pedestrians. I strongly encourage a ranking of which interchanges work best and why and develop some countermeasures that will effectively define the cyclist's space. Observation of interchanges esp. SPUIs suggest to me that the operational goal of the interchange is less of a hindrance than navigating massive undefined space. Work Zones: Almost anything would be helpful since there is so little guidance now. I would suggest that there are two parts basic guidelines to creating and signing the right kind of temp. accommodations and the signing itself which will need to be addressed with the NUTCD. Path/Roadway intersection sight distances: As a greater number of trails make midblock crossings this has become a greater concern esp. when the ADT increases on the roadway. This is a case where overdesign may be appropriate in anticipation of increased traffic volumes. Barrier design: Just clean up the ambiguity.

This Guide is important in its entirety because it is the best reference to bicycle facilities. The signing and striping of a facility is covered in the MUTCD but guidelines for designing facilities are not covered thoroughly in the AASHTO Green Book. It also gives important considerations for planning and designing that are helpful to an individual new to the world of provisions for bicycles.

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I think the common sense things to get a cyclist from point A to point B safely are very important.

How a facility accommodates bicyclists is critical to users, both competent and novice.

As dispersed throughout the remainder of this survey, DOT's need to approach cycling as a mode of transportation that has to be integrated into the motorized environment. All of my comments are postured from that viewpoint.

Measuring How Well a Facility Accommodates Bicyclists- It is important to conduct periodic operational reviews. (Describe methods and recommended timelines.) Bike Routes: It is important to establish bike routes so that when existing roadway segments or new facilities are under construction that bicyclist will be accommodated. (Emphasize that agencies have this criteria to consider during project development.) Maintenance of Bicycle Traffic Through Work Zones: (Show methods to be used during construction activities so that bicyclists can get safely through these areas.) Trailheads: (Emphasize the development of Park & Ride Trailheads so that bicyclists can have access to trails to optimize commute alternatives.)

Need more guidance on designing safe bicycle accommodations at and around an interchange in urban area.

The rules of the road should apply equally to cyclists with no special provision that diminishes those rights or induce cyclists to ride in ways that are unexpected by other users of the roadway.

The special 'keep right' rule for cyclists should be replaced by a 'lane sharing' rule and the existing 'keep right' rule for all slower traffic.

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Only when bicycles learn how to properly deal with motor vehicle traffic and learn to obey the same laws will there be acceptance of this alternate mode of transportation in this county.

For checking conformance of a bicycle lane/pathway, it is important that the design criteria's are definable and quantifiable. The guide becomes very vague when it lacks specific references to adjacent roadway types as stated in the 2001 AASHTO Green Book (urban collector, rural collectors, rural arterial, urban arterials, or local roads), volumes for the adjacent roadway, vehicle speeds, percentages relating to the types of traffic, bicycle volumes, or pedestrian volumes. Without these design criteria it is difficult to know when it is appropriate to use a share use path, bike lane or a separate use path. It also seems that these criteria may be important for determining geometric features of a bicycle facility.

Poor interchange design can create serious conflicts that are difficult to mitigate even for a skilled bicyclist. There is a definite need for examples of best practices in design and striping. Path-roadway intersections frequently and unrealistically treat bicyclists as pedestrians, again creating unnecessary conflicts and delays that could be avoided by better understanding of good design practices. The principle that bicyclists are best served by following the vehicular rules of the road is sometimes treated as a rhetorical technicality that is unsafe to take seriously. The Guide may need to emphasize even more strongly the engineering basis for its recommendations.

Safety

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I believe it is very important for the guide to help identify the appropriate facility type for the anticipated user, and to be flexible in order to fit into challenging real world landscapes.

Bike Routes – expand section on signage (use examples from NY, PA, etc.) Work zones - signage to show that bicyclists have a place; signs that bicyclists may claim the lane in cattle chute. Traffic regulations: identify signage that improves compliance and safety. Path/roadway intersection sight distances: establish minimums for various operator speeds.

Measuring... there are no national standards on capacity. This is CRITICAL. Evaluating... This is the most common way of accommodating bike traffic today. User type. We know still too little about the user and how it uses the road. Barrier... it impacts bridge design, which is costly and must last forever. Assigning... biking is a new area in many parts of the country, also to bikers. We need methods to facilitate them the best.

The safety of each bicyclist is the most important consideration for any governmental entity that provides hike and bike trails.

For the most part, road designers feel bikes are a nuisance and only accommodate them as an after thought which limits the bike facility. Each design aspect is important or very important to the usability and safety of the rider.

Single Point Urban Interchange. We need to have a good traffic theory for the operation of these, so that we can decide appropriate design criteria.

What other subjects do you feel need to be addressed, or more thoroughly addressed, in the next AASHTO Guide for the Development of Bicycle Facilities?

Many respondents stated they had addressed this question in previous sections.

Add definitions for manuals, guides and handbooks.

Add definitions for standards, criteria, guidelines, and options

Add a section on the causes of bicycle / motor vehicle crashes

Be very clear on how the correct operation of a bicycle influences specific design choices – bike lane placement, signing, striping

The two main user types must be defined and explained to the point that people understand that providing for bicyclists in many rural areas may mean nothing additional. Cross slope is a concern for the growing population of elderly and disabled on shared use paths, many of whom use adult trikes. Barrier design, use and dimensions need clarification.

Sound guidance for addressing the proliferation of user types on paths and in bike lanes, and their resulting conflicts, would be helpful. Bike lanes are now being used by skaters, joggers, motor scooters. Also, try to put some numbers to sidepath criteria (*i.e.*, under what conditions sidepaths may not be inappropriate).

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Storage at intersections.

The user who could be characterized as the white skinny guy (I'm a female but I consider myself a white skinny guy) is well served by the existing document. The need is to better serve the population that is not the white skinny guy.

Consideration of the shared lane arrow, aka sharrow, Denver arrow.

In general I believe the general topic of routine accommodation needs to be more thoroughly and forcefully addressed.

Education of cyclists that they need to follow traffic laws, just like all other vehicles.

The very concept of 'bikeway' should be phased out in the discussion of roadways, in favor of universal accommodation of cyclists as equally entitled drivers of vehicles. 'Bikeway' designation of some roads but not others has the undesirable effect of marginalizing cyclists' use of roads or travel lanes that are not designated 'bikeways'. This is especially problematic in those communities that focus 'bikeway' development on 'back roads' and circuitous routes that are inconvenient for travel to important destinations, and ignore the corridors that cyclists most need to use. Segregation of cyclists from other drivers should be reduced or minimized to those areas where it may provide operational advantages sufficient to outweigh the known operational and social disadvantages of segregation by vehicle type.

Appendix

Bicycle boulevards, a short checklist of what needs to be considered in non-bike-specific facilities to make sure they accommodate bikes, or at least don't cause problems.

Bicycle detours during construction and maintenance operations.

Roundabout design guidelines Right of Way signage on multi-purpose trails rumble strip placement raised pavement markers delineating bike lanes traffic signal detection of bicycles

Transportation planning, smart growth, traffic calming, rumble strips

Intersection design is a major concern. I would like the AASHTO guide to include every possible scenario as described in the Chicago Bike Lane Guide. While I can personally use the Chicago guide, having the information in the AASHTO guide will help me sell the concepts to our traffic engineers. Also the bicycling community is always pushing us to use the AASHTO guide. We agree and we do. However there are at times constraints that will not permit us to provide full accommodations. When this happens we can still express to the bicycling community that we are using the AASHTO guide by referencing one of the included designs.

Some reference to the need for marketing, community outreach -- 'Now I have my study completed, what's the best way to use and present the information' kind of approach.

Include discussion about the applicability of painted crosswalks at trail crossings of highways (essentially mid-block crossings).

Appendix

Many users of the guide would like to see more guidance on how to select the appropriate type of bicycle facility for a particular set of conditions or roadway type.

1. Existing facilities. 2. Maintenance of facilities.

Education should be stressed as the best way to improve cyclists' safety. Although this is not AASHTO's function, AASHTO could greatly help its members and those using the Guide by pointing out the importance and benefits to society of cyclist education.

Bikes on trains and buses.

Set back from road, considering the splash zone and snow storage. If a bridge carries a shared use facility on a raised sidewalk, should the curb drop-off be protected with a traffic barrier?

Planning and location of bike/ped corridors for alternative traffic movement. Funding of these facilities. How to get the public on board, many times people need to be shown how nice the facilities are and that there will not be adverse affects on their neighborhood.

How roundabouts can be made bicycle friendly. How to make do with minimal money. Safe routes to school and other initiatives.

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Some type of education process. I don't think the majority of drivers know what is expected of them when they are around bikes and what their responsibility is concerning the bicyclists.

Again, I believe that the sidepath issue is huge. Illustrations showing turning motorists' viewfields and other visual graphics can hammer home the text describing intersection problems. Don't categorically denounce sidepaths, but instead provide further guidance on appropriate vs. bad locations, and design methods to lessen risks.

Reasons for NOT using wide sidewalks or shared use paths adjacent to roadways as the only bicycle accommodation. Greater emphasis on need for multiple solutions in a single corridor or project for various anticipated user types (A,B,C)

The green book actually makes recommendations for motor vehicle lane widths based on vehicle speed. Why does AASHTO take a one-size-fits-all approach with respect to bicycle facilities? I find the FHWA 'Selecting Roadway Design Treatments...' approach to be better, and the LOS approach to be better still, than the AASHTO approach.

Tunnels or bike/ped underpasses are always a dilemma.

“Width of curb ramps for 10' {3.0 m} wide shared use paths. Appendix - elaborate on legal issues, such as the congressional laws requiring all modes of transportation be accommodated.”

Relationship to ADAAG

Appendix

Soft surface trails

It would be good to have a section spelling out useful techniques in the 'recycling' of some former rights of way (e.g., rails-to-trails) into a multiuse path. Questions of how to address commonly found elements such as the ballast, what to do at bridges, or locations where bridges have been removed.

Two lane roundabouts and the potential for conflicts with vehicular cyclists.

Non-standard human-powered vehicles (recumbents, trikes, child trailers, etc.)

Designing a bicycle boulevard Road Diets Reverse angle parking Access Management

Maintenance guidelines need to address the importance of clean, unobstructed surfaces and clearances. These are critical to users and help prevent accidents.

Bridge railing design parameters and guidelines. For example, openings between railings that could entrap children, the direction of the railings (horizontal vs. vertical).

Construction methodologies of facilities including soft surface rail-trail type facilities.

Cost estimates

Paths should be routed to avoid objects falling or thrown from vehicles on curved bridges and overpasses. Shared use paths are not appropriate for all cyclists and should not be mandatory

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over surface streets. Sidewalk connections must never be mandatory. Traffic light push buttons on the right side of the road encourage cyclists to be on the right side of a right turning lane. Use sensitive traffic loops instead.

Stronger minimum design standards; clarification on engineering analysis;

More attention should be paid to Big Oil's plans for many-laned highways that encourage more driving and burning fossil fuels; alternate fuels and the Car Companies who invest in them should be applauded.

Provide the engineering and/or research basis to back up recommendations, when it's available.

Please see my comments above about the education of the constabulary. In my mind, this is a must. I've suggested it to LAB on several occasions, to be told each time that there are bike patrols, so the cops know what they're doing. That's NOT the point. I acknowledge that the bike officers know the laws and the potential for difficulties with motorists. It's the OTHER police who simply don't get it. And they need to, since they're there to protect cyclists as well as motorists.

Because pathways are for many users, integration of design for all users needs to occur.

Appendix

1) Appropriate use of barrier and proper barrier design to separate limited access highways from path users - esp. at interchanges. 2) Discussion of ramp underpasses, including sight distance issues particular to them. 3) Discussion of multiuse path bridge design - especially related to highway overpasses long ramps - often with switchbacks and borderline or unacceptable grades. Interface with street at the terminus of overpasses has been a problem - especially related to child safety. 4) Traffic calming discussion and cross reference for street crossing locations. 5) Traffic calming of those cycling 6) Bollard use for prevention of unauthorized vehicles - design issues related to emergency and maintenance access.

To make it easier to find topics and navigate the Guide, please change the Chapter and section title format to a decimal system -- e.g., Chapter 1, Major Section 1.1, secondary section 1.1.1, and consider changing the figures and table numbers to be independently numbered in each chapter. Also, please add an index at the end of the report. Less important, but worth considering, is adding a glossary of some of the most important and common design/technical/traffic operational and planning terms used in the Guide.

Incorporate FHWA Selecting Roadway Design Treatments to Accommodate Bicyclists.

Bike network development.

References for Bicycle Education

Appendix

Make sure safety is mentioned or you might put a website where people can go to find out about safety rules or a website with information on the laws for bicyclist on roadways. I know they are considered a vehicle, but it's important for bicyclist to respect vehicles as well and not assume because they are on a bicycle the law does not apply to them.

Bicycle parking facilities

- Road diets. - Bicycle LOS. - Work zones: use same signs as 'motorcyclists use caution' but add us: 'bicyclists & motorcyclists use caution' Add brief discussion of the 5E's: Education, Encouragement, Enforcement, Evaluation and planning -- in

The Oregon Bicycle Pedestrian Plan (<http://www.odot.state.or.us/techserv/bikewalk/toc-imag.htm>) and the Santa Clara County, California, VTA Bicycle Technical Guidelines (<http://www.vta.org/news/vtacmp/Bikes/Bike%20Tech%20Guidelines.pdf>) each cover a number of interesting topics that should be considered for inclusion in the AASHTO Guide.

As mentioned, the Guide doesn't provide an alternative to the mixed-use path when describing segregated facilities, but Stevenage, UK, is a better model. However, its drawback is that it is only really practical in a situation where a new development is planned from the ground up. For this reason the normal road system must remain the standard widespread facility for bicycle transportation.

Correcting or removing badly designed separate facilities.

Appendix

Facilities that improves compliance with known safe practices (if you can find any), and discouraging facilities that invent unique practices applicable only to that unique facility.

It did not occur to me until I went through the above list that we do not mention bike construction detour provisions. This is another area that the NCUTCD Bike Tech Comm is currently addressing, and this document should be worded similarly in this regard.

Do you have any additional comments or recommendations that should be considered for the next update to the AASHTO Guide for the Development of Bicycle Facilities?

Arrange the document more like the Green Book. Separate design criteria by facility type.

Who has the right of way at intersections is critical. Too many bicyclists are injured at these locations. We need signage to clarify who yields. Like motorists, bicyclists still need to go places despite road work. If we provide detours for motorists, we must do so for bicyclists. Interchanges and intersections in high traffic areas can be extremely frightening for bicyclists.

In Vermont, I helped craft many of the transportation documents as a citizen. It was difficult to donate the time to suggest the edits and then not know if the edits were incorporated or, if they were not, not know why. The public participation process is a difficult one because much burden is placed on the volunteer participants (who receive no remuneration) and yet they sometimes contribute a significant amount of time. This has probably taken me close to 2 hours to complete because I have been trying to be very thorough. Please do get back to me to tell me if you believe my suggestions can be incorporated. Please also tell me if there is a due process where these suggestions could be aired. You have been very kind to read my suggestions and I trust you will overlook any zeal on my part. Thank you. Anne

Governments should not micromanage/microregulate bicyclist on-road lateral position with bike lane stripes.

Appendix

Paths and Paint will never protect cyclists from themselves. Please stop relying on facilities to solve a behaviour problem.

The very concept of 'bikeway' should be phased out in the discussion of roadways, in favor of universal accommodation of cyclists as equally entitled drivers of vehicles. 'Bikeway' designation of some roads but not others has the undesirable effect of marginalizing cyclists' use of roads or travel lanes that are not designated 'bikeways'. This is especially problematic in those communities that focus 'bikeway' development on 'back roads' and circuitous routes that are inconvenient for travel to important destinations, and ignore the corridors that cyclists most need to use. Segregation of cyclists from other drivers should be reduced or minimized to those areas where it may provide operational advantages sufficient to outweigh the known operational and social disadvantages of segregation by vehicle type.

An index would be a very welcome and useful addition to the guide.

Are there good mechanisms for getting this bicycle design guidance into the 'mainstream' of transportation agencies culture? Can we get highway engineers to accept this guidance in the same way they accept motor vehicle/highway design guidance as a 'standard'?

Reference the recent ITE publication 'Innovative Bicycle Facilities.'

I would appreciate more figures, graphics, and/or photographs of designs issues.

Appendix

Education should be stressed as the best way to improve cyclists' safety. Although this is not AASHTO's function, AASHTO could do its members and users of the Guide a great service by pointing out the benefits of education to cyclists and society.

1. Provide any updates to design of bicycles at roundabouts. 2. On page 36 include the 42” {106.7 cm} min. height for the safety rail in the text. Also, what should be the offset for the railing? 3. Additional guidance for the warranting of a safety rail should be included based upon slope adjacent to the path and the height or drop. I have copies of some guidelines from other publications that provide the following guidance: Consider safety rails when: a) slope equal or steeper than 3:1 and height equal or greater than 6 ft {1.8 m} b) slope 2:1 and 4ft {1.2 m} c) slope 1:1 and 1 ft {0.3 m} I have some figures that I can send if you will provide your fax.

No

References to 'vehicle' should specify 'motor vehicle'; a bicycle is a vehicle too, at least in terms of rules of the road.

The nuts and bolts aspect of the manual is fine, need more of the human element effects on bike facilities.

Overall, a good manual. Needs a wider variety of words at times. After reading the Inventory of Existing Conditions on p. 9, I developed this list of words: notice, distinguish, deduce, conclude, glean, associate, recognize, pinpoint, scrutinize, question, analyze, investigate, research, delve, indicate, critique, deliberation.

Appendix

The overall guide is excellent for this being the first time I have ever seen it. I would suggest making more user friendly by making things in bullets or charts so that things can be looked up quickly without reading the entire section. This seems to be a very technical document, but for ease of use it should be made a little more user friendly

Some of the design criteria for trails may be loosened a bit, as very many feel that following AASHTO strictly results in over-engineered 'superhighways'.

1) Perhaps a standardized form that helps people complete an inventory of their community bike facilities. 2) An assessment tool that helps designers evaluate bike and ped facilities.

Get the 'Guide' to the same level of acceptance and regulation as the 'Green Book.' As long as it's a 'guide' with only 'recommendations' it will not be taken seriously by the vast majority of transportation planners and engineers. 'Should to be shall' and 'may to must.'

General Note: Recommend replacing 'bicycle' with 'bicyclist' throughout the document when appropriate - the typical bicycle doesn't do much without a rider. :) Cover: Use conventional upper and lower case text or all-caps. The all-lower-case text looks unprofessional and unbefitting a formal AASHTO guideline. Also, the green color has caused some users to mistakenly believe this document is the fabled 'Green Book', whereas the true 'Green Book' is the Policy for Geometric Design for Highways and Streets - a much different (and heavier) document. Page 1, Introduction, 1st paragraph: The League of American Wheelmen (now the League of American Bicyclists) should be credited with founding the Good Roads Movement in

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the United States in the 1880s, and the text should note that the organization continues to this day. Page 1, Introduction, 2nd paragraph: Is recreation still the primary use? Verify with good recent data. Page 1, Purpose, 1st paragraph: There can be high bicycle use and ridership even in the absence of good facilities, such as in many dense urban cities in the US. The first sentence could be (and has been) misinterpreted as justifying restrictions on bicycle use if there aren't safe, convenient, and well-designed facilities - even if there is the need for cyclists to use such a route. Recommend replacing the word 'essential' with 'useful' or 'important'. Also, specifically mentioning sidewalks can create the mistaken impression (if the reader doesn't read the details) that the Guide condones travel on sidewalks. Recommend removal of sidewalks from this section.

Retrofitting existing roads.

This is a very good guide. Comments made are only to given to enhance an excellent resource.

Look at the other guides that do it better: Dutch Guide by CROW Danish Guides Oregon Guide One of the reasons I don't use the guide that much is that there are better ones. But it would be great if the guide were one that was better.

Make the bike paths red like tennis court red sealcoat similar to bike paths in Holland. Clearly define path to bikes and cars.

Appendix

I found the current guide (1999) to be very thorough. I was also very appreciative that Kathy Ridnour of the Iowa DOT sent out a copy overnight to Kathy Wine of River Action so that members of the Quad Cities Bicycle Club could have the opportunity to complete this survey.

Since much of what this publication is attempting to achieve is targeted at highway and street designers, it may make sense to eventually seamlessly integrate this material as a part of the AASHTO 'Green Book.' The objective should be to make applying quality facilitation for people cycling a standard part of how we design streets and highways - causing designers to perform extra work to justify if they can NOT provide such facilities instead of the other way around.

Minor comment: The use of terms 'cyclist' and 'pedestrian' sometimes have negative connotations to some people in our language. I have been preferring 'people that are cycling' and 'people that are walking' and 'people that are driving' - reinforcing that facilities for all these modes are not segregated by the 'category of person you are' - they relate back to everyone.

Transportation facilities are for everyone and should provide mobility, safety and a quality experience for any modal choice made. Thanks! Roger K. Weld, P.E. Non-Motorized Transportation Coordinator for NYC New York State Department of Transportation 47-40 21st St., LIC, NY 11101 (718) 482-4848 rweld@dot.state.ny.us

Greater specificity is needed in some areas perhaps tables and other measurement indicators should be considered rather than qualitative explanations. More specificity would be helpful as long as these are guidelines and not actual design specifications.

While the information is of a high quality I want to see more effort put into its presentation so that information is easy to find and relatively transparent.

Appendix

The subject I would like to see improved is the signing and striping. I use this guide to improve existing facilities and design new facilities. There are items in this Guide that are not covered in the MUTCD and it would be helpful as I mentioned previously to have all the signing and striping criteria contained within one section for easy reference as opposed to reviewing the entire Guide for the appropriate section.

1. Provide a comprehensive key word index. 2. Use a telegraphic summary writing style with numbered paragraphs to shorten and highlight the ideas.

Should not take several years to complete

While there are many things that I have indicated I think should be different, the 'Door Zone' issue is of greatest importance to me and is the one major change that really must be made in these guidelines.

I remember how contentious the 1999 revision was, and how many parties insisted that their concerns should be taken into account. Considering the difficulty of satisfying everyone, I think the result was remarkably good, and a great improvement over the previous version. I hope the experience can be repeated in this update.

This guide is very important because it is the only document with a national recognition.

Therefore it needs to address all the major issues of bike facilities development process either

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directly or by references to other standards, similarly to the Green Book. The process should follow the vehicular design process: starting with planning, followed by capacity analysis, desired capacity, then only to geometry and a detailed design.

The whole concept of a Guide for Bicycle Facilities needs to be analyzed and some reasonable theory developed. As it is, the Guide is a repository of sometimes useless and sometimes dangerous information, supported by a superstition that we know to be false and detrimental to safe and useful bicycle transportation.