

Considerations, Process, and Practice for Bicycle Planning



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UAP 5904
Project and Report
Spring, 1999

Considerations, Process, and Practice for Bicycle Planning

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Major Paper Submitted to Faculty of the
Virginia Polytechnic Institute and State University
In partial fulfillment of the requirements for the degree of

MASTERS OF
URBAN AND REGIONAL PLANNING

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May, 1999

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Abstract

Picture for a moment your commute to work, school, or any other destination you make on a regular basis. Chances are, you imagine automobiles moving along a highway, or you see yourself traveling to the bus or subway station to use a form of mass transit. At any rate, you are probably not picturing the use of a bicycle. Yet, in many European and Asian countries this scenario is quite common. Because of our predisposition for the car, planners in the United States continually face the problems of congestion, pollution, and energy-efficiency when examining transportation issues. In spite of this affinity for the car, bicycle use has gained momentum during the past 25 years, creating the need for more bicycle facilities. The following paper chronicles the emerging importance of bicycle planning to create multimodal and intermodal transportation systems and examines several issues that surround the implementation of effective bicycle facilities.

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Chapter 1

Introduction

Picture for a moment your commute to work, school, or any other destination you make on a regular basis. Chances are, you imagine automobiles moving along a highway, or you see yourself traveling to the bus or subway station to use a form of mass transit. At any rate, you are probably not picturing the use of a bicycle. Yet, in many European and Asian countries this scenario is quite common. Because of our predisposition for the car, planners in the United States continually face the problems of congestion, pollution, and energy-efficiency when examining transportation issues. In spite of this affinity for the car, bicycle use has gained momentum during the past 25 years, creating the need for more bicycle facilities. The following paper chronicles the emerging importance of bicycle planning to create multimodal and intermodal transportation systems and examines several issues that surround the implementation of effective bicycle facilities. In addition, two different communities and their bicycle planning efforts are described to provide a more in-depth examination.

Perhaps, it is appropriate to begin with a definition of bicycle planning as it is used throughout this paper. For the purposes of this study, bicycle planning is preparing for and providing safe and efficient facilities that accommodate both on-road and off-road cyclists within the context of a larger, interconnected transportation system. The word facility is used throughout the paper as well. The American Association of State Highway and Transportation Officials (1991) defines bicycle facilities as improvements or provisions made by public agencies to accommodate or encourage bicycling, including parking facilities, mapping all bikeways, and shared roadways not specifically designated for bicycle use. Table 1 provides examples of several types of facilities. For additional definitions related to bicycle planning, refer to Appendix A.

Table 1: Examples of Bicycle Facilities

Facility	Description
Bikeway	Any road, path, or way which in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.
Bicycle Path	A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way.
Bicycle Lane	A portion of a roadway which has been designated by striping, signing and pavements marking for the preferential or exclusive use of the bicyclist.
Bicycle Route	A segment of a system of bikeways designated by the jurisdiction having authority with appropriate directional and

	informational markers, with or without a specific bicycle route number.
Shared Roadway	Any roadway upon which a bicycle lane is not designated and which may be legally used by bicycles regardless of whether such facility is specifically designated as a bikeway.
Signing and Marking	Visual aids which alert cyclists to conflicts and indicate directions, destinations, distances, route numbers and names of crossing streets.
Bicycle Parking	Parking facilities provided at trip origins and destinations including amenities such as bicycle lockers or racks.

Source: The AASHTO Guide, 1991

Chapter two discusses the attitude shifts and movements that increased the need for bicycle planning. Next, early bicycle planning is explored with regard to the work of Mike Hudson. In addition, the need for a bicycle master plan is explained and the bicycle planning process is described in a step by step format. Chapters three, four, and five address specific topics related to the implementation of a bicycle plan. Integration, construction and federal funding are discussed in these sections. The integration chapter discusses the vital components of intermodalism, continuity, and connectivity. The construction chapter explores the current standards and guidelines which govern the design and construction of bicycle facilities. The federal funding section examines federal funding programs pertinent to bicycle planning. Parts six and seven explore the issues as they apply to two very different areas, Blacksburg, Virginia and Montgomery County, Maryland. Finally, the conclusion provides suggestions for policy, planning, and process changes for the successful implementation of a bicycle program.

Chapter 2

Historical Context, Public Participation, and the Bicycle Master Plan Process

Attitude Shifts Leading to the Need for Increased Bicycle Planning

Several broad movements are pertinent to the development of bicycle planning. The concepts generated from these movements deal directly with bicycle planning and must therefore be addressed prior to the examination of bicycle planning as it is practiced today. Moving chronologically, the first of these movements is known as “Pedestrianization.” This concept was first expressed in pedestrian shopping malls of the 1950’s and 1960’s. They were designed to “reduce the negative impact of cars on shoppers” (Francis, 1987, p. 25). By the late 1960’s and 1970’s this movement focused more on the pedestrian rather than the shopper. Then in the mid-1970’s the auto-restricted zone emerged. These areas either prohibited automobiles altogether, or restricted cars to certain times of the day. The Pedestrianization movement is important to bicycle planning because of the types of spaces it created. Because planners aim to accommodate both pedestrians and cyclists, these spaces can often be transformed into areas that are well suited for bicycles as well as pedestrians; thereby enhancing the space and making it accessible to more users.

The second movement involved the increased bicycle ridership that occurred in the early 1970's. With the advent of the automobile and its widespread use, it appeared as though cycling would eventually disappear by the 1960's. However, the gasoline crisis in 1973, the increasing costs associated with owning an automobile, and the importance of personal fitness, all led to a resurgence of bicycle use. Unfortunately, thirty years of planning for motor vehicles resulted in a road network which was unsuitable for the bicycle and dangerous for cyclists (Hudson, 1982).

The third movement deals with street design and how cars, bicycles, and pedestrians move within the street. Developed in the late 1970's by William Whyte and Donald Appleyard, this theory is often referred to as the "livable streets" concept. Livable street design combines environmental and social concerns. Appleyard's philosophy can be summed up as follows: "streets must be more than channels for car transportation; they must also accommodate people on foot, on bicycle; they must be a social place for people to meet face to face; and they must bring additional green space to communities" (Moudon, 1987, p. 16). This concept is important to bicycle planning because it does not view the automobile as the most vital mode of transportation. At its best, the livable street functions with cars, bicycles, and pedestrians.

Early Bicycle Planning

The creation of separate facilities for automobiles and bicycles was the first solution used by planners to accommodate the increased bicycle ridership in the mid-1970's. This approach worked for newly developing areas, but was less successful in existing urban areas (Hudson, 1982). In addition, such an approach failed to consider accessibility, continuity, or coordination with other jurisdictions.

Throughout the 1970's, other factors began to emerge as vital to the success of bicycle planning. First, the importance of education for the motorist and the cyclist became an issue. Second, law enforcement and safety are crucial components to the successful implementation of bicycle facilities. Third, the actual design of the bicycle path must be suited to all types of cyclists. Finally, cycle routes must work in conjunction with other modes of transportation including bus, rail, and automobile.

Clearly an integrated approach to bicycle planning is necessary. Based on the concerns outlined above, Hudson (1982) developed six principles of planning for cyclists.

- Cycling plans must be integrated into all transport plans.
- An administrative framework that communicates with both the public and other government agencies must be in place.
- Planners must use the existing transport system and construct new facilities.
- Cyclists and motorists must recognize a common set of rules.
- Bicycle facilities must be maintained and their performance must be monitored.
- Planners must recognize that cycling has its own set of opportunities and constraints.

Hudson's principles still hold true today. However, more recent bicycle planning guides stress the second principle: an administrative framework that communicates with both the public and other government agencies is necessary.

Public Participation and Regional Cooperation

An important aspect of bicycle planning is public participation. Citizen input is crucial because bicycle facilities are intended for and used by the general public. The success of any bicycle facility depends heavily on how the public uses the transportation system and whether that facility is safe, practical, and beneficial for the cyclist. Creating the type of system that cyclists prefer using not only requires public input, but also requires an examination of the regional transportation network.

Regional cooperation entails broadening the scope of stakeholders to include citizens and planners from surrounding communities. Working with adjacent communities, towns, or counties benefits users and aids the bicycle planning process. Users of a regional bicycle system gain the benefit of increased options and destinations in the bicycle network. Regional cooperation aids the bicycle planning process by providing additional resources and greater input for better decision-making. Bicycle systems should not terminate at municipal boundaries if the opportunity for additional links is available.

A bicycle advisory committee, bicycle coordinator, and committed public officials are necessary to obtain adequate public participation and to facilitate regional cooperation. These individuals are responsible for meeting the community's cycling needs based on public input. A local bicycle advisory committee typically consists of interested members of the planning commission, several citizens at large, and cyclists (preferably those who represent large segments of the cycling population). The bicycle advisory committee should function as a platform for local citizens to express ideas and concerns regarding local bicycle issues. In addition, the local planning body may send a representative from their planning, engineering or public works departments. Finally, it may also be helpful to have a representative from the state department of transportation at the meeting (Virginia Department of Transportation, 1994).

The bicycle coordinator may be a member of the planning department or an active citizen. Often, small localities do not have the staff or money to support an additional person for the role of bicycle coordinator. If the bicycle coordinator is a citizen, the position is typically part-time or may even be a volunteer. The bicycle coordinator has the task of bringing together several agencies (planning, engineering, public works, transportation, parks and recreation, schools, police departments, and local cycling clubs) to plan for bicycle facilities. The bicycle coordinator must operate on a regional level, including all stakeholders in the planning process. This may include other area governments, school districts, and planning bodies. Therefore, the bicycle coordinator must be highly organized, easily approachable, and willing to consider the interests of several diverse groups.

Committed public officials are crucial to the success of bicycle planning. Although public officials may also be bicycle advocates, their ability to present public opinion to

local planners is most important. These officials must consider the bicycle system within the context of a regional transportation network.

Why Develop a Bicycle Master Plan

Several reasons exist to develop a bicycle master plan. First, the bicycle master plan can be tailored to local needs and concerns. For example, a rural community may want to focus on recreational trails, while a more suburban community may focus on access between neighborhoods and adjacent schools. Second, the bicycle master plan aids in the funding application process. Establishing goals and priorities with regard to cycling directs the types of funding needed. Third, developing a bicycle master plan provides a golden opportunity to involve the public. The general guidelines for an acceptable plan in the state of Virginia appear in Appendix B.

The Bicycle Planning Process

Although localities have different opportunities and constraints, there are some basic considerations that every community must keep in mind when planning for bicycle facilities. The following numbered list is a summary of the bicycle planning processes described by Musser and Pinosof (1995) and by the Virginia Guide for Bicycle Facility Planning (1994).

1. *Set plan goals and objectives.* This step involves establishing a vision for the community. This is best achieved through adequate and continued public participation and coordination with the bicycle advisory committee. Public participation activities include workshops, surveys, and a myriad of other activities. The bicycle advisory committee should be dedicated to supplying the public with all the necessary information. For example, a monthly newsletter announcing meeting times and upcoming events is an excellent outlet.
2. *Set design criteria and understand bicycle facility improvements.* Determining who will use the facility is a key question in bicycle planning. This involves establishing a user profile that considers national and local bicycle use patterns. Of the nearly 100 million people in the United States who own bicycles, less than 5% are highly experienced bicyclists (Virginia Department of Transportation, 1994). Because of this fact, bicycle planning must take all skill levels into account. Table 2 describes Wilkinson's classification of each type of rider. The planner must understand what bicycle facility improvements are available, how they are implemented, and what impact they will have on the current situation.

Table 2: Classification of Rider Types

Type	Description	What they prefer
A-Advanced Bicyclist	Can operate under most traffic conditions	Efficiency, maximum speed, few delays, ease of passing, sufficient shoulder area
B-Basic Bicyclist	New adult riders, teen-age riders	Direct routes, low speed, low traffic volume, well-defined or separate routes
C-Children	Children, usually monitored	Adjacency to schools, parks, low speed, well-defined routes

Source: A Virginia Guide for Bicycle Facility Planning, 1994

3. *Establish performance criteria.* In the context of bicycle planning, performance criteria are used to define important variables including, but not limited to, accessibility, continuity, safety, and cost. Performance criteria vary based on the type of bicycle facility you are implementing. For example, many communities consider access to schools, and connections between adjacent schools an important aspect of bicycle planning. Naturally, these routes are designed to accommodate children and need to be evaluated with respect to the level of automobile/bicycle interactions. Other performance-related criteria include directness of route, coordination with other transportation modes, and feasibility of the implementation.
4. *Analyze the current situation.* This step involves gathering data to access present conditions. This is best achieved through a simple but complete list of questions. Naturally, this list will vary depending on the community. A typical list should include questions about the locations of schools, universities, community colleges, parks, libraries, civic centers, community centers, residential areas, and commercial hubs. In addition, the analysis should include an assessment of current bicycle facilities and who uses them. A user survey or neighborhood workshop can be used to obtain this information. Other transportation routes should be noted along with commuter patterns and large employment areas. The number of bicycle-related accidents should be determined, as well as any impediments to current bicycle use. Once this information has been obtained, it is helpful to make a series of maps that graphically represent the data. This facilitates the analysis of current conditions and will help determine trends and patterns related to bicycle use.
5. *Develop and evaluate desired routes and designate types of facilities.* This step involves the physical placement of routes and the types of improvements to be made. This evaluation addresses the data needs as determined by the analysis of the current situation. In addition, this process involves the bicycle advisory committee and the public at large.
6. *Develop and recommend bicycle education, safety, law enforcement, and encouragement programs.* This often overlooked step in bicycle planning is crucial to maintaining a successful and comprehensive bicycle program. Education and safety programs can be conducted at the elementary, middle, and high school levels. Bicycle hand signals and bicycle safety should be taught in driver's education classes.

Laws related to cyclists must be clearly stated and enforced by the appropriate agencies. Encouragement programs serve to facilitate bicycle use. For example, employers can sponsor a “bike to work day” each month and communities can sponsor trail competitions, races, and other bicycle -related events. These events not only encourage bicycle riding, but also foster community spirit and cohesion.

7. *Develop an implementation plan.* Developing an implementation plan includes, but is not limited to, the following issues. First, how will the new facility connect and work with existing transportation modes to provide a more intermodal system? Integrating the new facility is key to successful implementation. Second, construction and design issues must be addressed with regard to each specific region. The improvements made must be appropriate for all cyclists in order to meet the needs of the entire community. Third, new bicycle facilities and many improvements are costly. Obtaining the money requires knowledge of the funding mechanisms in place at the national and state levels. Local funds are often exhausted on other projects not related to bicycle planning. Localities must strategically plan for bicycle facilities to make them a reality. Finally, the planner must determine who will maintain the facility once it is in place and decide from where maintenance funds will come.

Chapter 3

Integration of Bicycle Plans with Other Transportation Modes

Components of Intermodalism

Making other transportation systems work with bicycle facilities is one of the greatest challenges of bicycle planning. Two fundamental concepts imperative to the success of integrated transportation modes are continuity and connectivity (Camph & Siwek, 1999). Here, the word continuity describes how the cyclist uses the facility within the larger scheme of a transportation network. Bicycle facilities must contribute to a transportation system that allows safe and efficient movement for all modes of transportation. Continuity directly relates to construction and design issues. The second component of intermodalism, connectivity, refers to the relationship that exists between modes of transportation. Ideally, this relationship should be a network of seamless connections. Mass transit, motor vehicle, and bicycle modes should form a system that benefits all users without compromising safety.

Effective Continuity

One of the most effective ways to assess continuity on existing bicycle routes is through public participation. The Virginia Guide for Bicycle Facility Planning (1994) suggests a road user survey to obtain public input. The survey asks questions regarding destination, time of day, location, length of trip, frequency of use, facility convenience, perception of safety and what improvements can be made. All these issues can be evaluated and modified to provide a more continuous bicycle route. For new bicycle routes, these issues should be addressed prior to the design and construction with an evaluation of existing conditions.

Effective Connectivity

The growing relationship between bicycles and mass transit serves as an excellent example of effective intermodal connectivity. This connectivity has been significant in European and Japanese communities for several years. In Japan and in much of Europe, the bicycle serves as the predominant means of access to public transportation hubs and is the fastest growing mode of transport (Replogle, 1993).

Bike-and-Ride services have several positive outcomes at both the local and regional levels. First, providing bicycle facilities is more cost-effective than automobile facilities, such as a park-and-ride system. Generally, park-and-ride systems focus on the commute from the suburbs to the central city. However, the park-and-ride system fails to acknowledge that a majority of employment destinations are now from city to suburb, or from one suburb to an adjacent suburb. These types of destinations would otherwise be reached by automobile. This is where mass transit plays a critical role and where bicycle facilities need to be considered. Besides costing less than automobile spaces, bike spaces require less square footage. Bike-and-ride initiatives function to aid energy conservation, lessens air pollution emissions, and reduces traffic congestion. Finally, cycling contributes to the improved health and fitness of the rider.

The key to implementing an intermodal transportation system in the United States relies heavily on four factors. First, a network of connected and continuous routes must exist. Although federal funding programs encourage this, bicycle planning must be integrated into all transportation plans. Second, an attitude that the automobile is the only viable means of transport must be abandoned. Education regarding bicycle travel is crucial. Third, adequate facilities must be in place to encourage bicycling to and from mass transit. Such facilities include guarded or secured parking spaces and bicycle lockers. Finally, new development must be produced with bicycle access and accommodation in mind. A capital facilities program to fund non-motorized projects and development standards that specify minimum bicycle requirements are two ideas suggested by traffic engineer Paul Krawczyk (1995).

Chapter 4 **Construction of Bicycle Facilities**

AASHTO

Another important issue facing planners is the construction of the bicycle facilities once the funding has been obtained. The majority of planning bodies use the *Guide for the Development of Bicycle Facilities* prepared by the American Association of State Highway and Transportation Officials (AASHTO) as a manual for construction guidelines. The Federal Highway Administration accepts the standards set forth by AASHTO for the construction and design of bicycle facilities. These standards must be adhered to when construction involves the use of federal funds. The AASHTO Guide, as it is more commonly known, was first published in 1981. The second and current version was made available in August 1991. The manual is divided into four sections including an introduction and three chapters which address planning, design, and operation and maintenance.

The introduction explains the purpose and scope of the guide, including some common definitions. A publication such as The AASHTO Guide is necessary because, “the majority of bicycling will take place on ordinary roads with no dedicated space for bicyclists” (AASHTO, 1991 p. 1). Take this fact into account and recall that less than 5% of all cyclists are considered to be highly skilled. For these reasons, planners must provide bicycle facilities that are adequate and safe for all cyclists. This is the aim of the AASHTO Guide.

Chapter One of the AASHTO Guide (1991) deals briefly with planning. The following points are made:

- Existing highways will usually serve as the base system for bicycle facilities. Separate facilities are not the answer.
- Bicycle trips can usually be identified as either recreational or utilitarian.
- The current situation must be analyzed, i.e., existing bicycle environment, laws, any public participation, and additional data.
- How improvements will affect the current environment must be analyzed.
- There are several factors to consider when selecting a new facility.
- Planning must involve the public. Often a bicycle advisory committee is the most efficient and productive means of public participation for localities (AASHTO, 1991, p. 5-7).

The majority of the AASHTO Guide is dedicated to design guidelines, found in Chapter Two. These design guidelines are not intended to provide strict regulations. Rather, they are intended to be broad, and therefore applicable to all community bicycle improvements. Because most bicycle routes are situated on existing highways, roadway improvements for safe bicycle use are a large part of the design process. Table 3 describes roadway improvements as they relate to the design process. Other design issues addressed in the AASHTO Guide include different modifications and guidelines for bicycle route, lanes, and paths. Each type of facility has a different set of constraints, which need to be considered. In addition, the guide provides information on appropriate design speeds, curvature of the bicycle surface, sight distance, lighting, and signing. Facilities should be developed in conjunction with the Manual on Uniform Traffic Control Devices (MUTCD), the Uniform Vehicle Code, and pertinent state codes.

Finally, the AASHTO Guide discusses operation and maintenance. Maintenance responsibilities must be determined before any bicycle facilities are constructed. Poorly maintained bicycle facilities present a hazard to the cyclist and deter regular use of facilities. Regular sweeping is necessary to insure that the route is free of debris or litter. It may be helpful to have a contact person who deals with operation and maintenance issues for bicycle facilities. Providing well-maintained facilities promotes use and reinforces the need for bicycle facilities.

Table 3: Roadway Improvements for Bicycle Facilities

Roadway Improvement	Description
Drainage Gates	Drainage gates/utility covers should be flush with the roadway and clearly marked
Railroad Crossings	Crossings should be at a right angle to railway with a consistent elevation and warning signs
Pavements	Consistent pavement is desired, the edge of the pavement should be at a constant width
Traffic Control Devices	Traffic lights should allow ample clearance time for cyclists, a good gauge is a 10 mph speed with 2.5 second braking/reaction time
Shoulders	Minimum shoulder width of 4 feet for bicycle travel, smooth consistent pavement
Wide Curb Lanes	Ideal lane width for car and bicycle use is 12 to 14 feet, allows ample space for both

Source: The AASHTO Guide, 1991

Impact of AASHTO

The AASHTO Guide has been a vital part of bicycle facilities planning since it was published in 1981. "AASHTO is nationally recognized as the fundamental basis for most state and local facility development" (ITE Technical Council Committee 6A-55, 1996, p. 46). Although state and local plans may deviate from the guidelines on certain issues, the general specifications of the AASHTO Guide are the basis for facility planning. Many improvements suggested by AASHTO are relatively inexpensive and easy to implement and maintain, making the guidelines an appealing option for communities.

Other Bicycle Guidelines and Organizations

In addition to the work conducted by AASHTO, several other groups monitor bicycle facilities and tackle construction and design issues. In 1996, the National Committee on Uniform Traffic Control Devices formed a new technical committee to address the technical issues related to bicycle planning. The National Bicycle and Pedestrian Clearinghouse conducts research and serves as the main contact for federal, state, and local bicycle agencies. The Bicycle Federation of America offers educational workshops and sessions for professionals and citizens. The Planning Advisory Service (PAS) of the American Planning Association produces technical reports, which address bicycle and pedestrian issues. The PAS also keeps a library of resources and can conduct research for members. The Transportation Research Board, a unit of the National Research Council, acts in much the same capacity as the PAS, producing reports related to all modes of transportation. These are just five of the numerous groups committed to the development of safe and efficient bicycle facilities.

Chapter 5

Funding of Bicycle Planning and Facilities

Federal Funding

One of the most pressing issues facing planners is how to obtain the funding for bicycle facilities. For the purposes of this paper, I will concentrate on the federal funding structure that has influenced bicycle planning in this decade. Two important federal transportation funding programs have greatly encouraged bicycle planning efforts: The Intermodal Surface Transportation Efficiency Act (ISTEA), signed on December 18, 1991, and its successor, the Transportation Equity Act for the 21st Century (TEA-21), signed on June 9, 1998.

ISTEA

ISTEA directly addressed the funding issue for state and local agencies in several ways. ISTEA gave states the ability to allocate funds in a more flexible manner, creating the opportunity to fund bicycle and pedestrian projects where no such opportunity had been available. Along with providing additional flexibility, ISTEA significantly increased the amount of funding received by states. ISTEA placed greater emphasis on the role of intermodal connections to create efficient transportation systems. “Meeting both the environmental and economic development needs of our society is the primary goal in developing an intermodal transportation policy” (Fiore & Stafford, 1995, p. 248). This goal has been adapted into four hallmarks that describe the mission of ISTEA:

1. “Half of all federal funding is flexible for highways, transit or other uses.
2. Decisions about how to use funds are made through inclusive and honest planning at the state and metropolitan levels.
3. Significant funding is reserved for maintenance of existing highway, bridge and transit systems.
4. A small but important sum is set aside to support alternatives to the highway system and reduce its negative effects on society” (Surface Transportation Policy Project, 1998b, p. 1).

ISTEA General Provisions related to Planning

ISTEA had direct effects at both the state and metropolitan levels. Under ISTEA, each state department of transportation is required to hire a bicycle and pedestrian coordinator. This person is responsible for promoting intermodal transportation facilities throughout the state. In addition, this person coordinates safety and encouragement programs related to bicycle and pedestrian facilities. The bicycle and pedestrian coordinator position is funded by the federal government by as much as 80% (Federal Highway Administration, 1993). States are also required to develop long-range transportation implementation plans which consider all modes of transport, including bicycle and pedestrian means. These plans must comply with the Clean Air Act Amendments (CAAA) of 1990. The planning process for state long-range plans is subject to a 20-item list which addresses economic, social and environmental factors (See Appendix C). In addition to the implementation plan, States must also develop a Transportation Improvement Program (TIP).

Metropolitan Planning Organizations (MPOs), which exist for all urban areas with a population of 50,000 or more, must develop long-range transportation plans for their regions. These plans must be developed in conjunction with state plans and must continue to include bicycle and pedestrian modes of transport. The planning process for a MPO plan is subject to a 15-item list, addressing economic, social, and environmental factors (See Appendix D). In addition, MPOs must develop short-term transportation plans that include public participation.

Funding Programs Through ISTEA

The money for federal programs is funded by the Highway Trust Fund (HTF), which was established in 1956 by the Highway Revenue Act. The main goal of the HTF was to fund the building of the Interstate Highway System. Today, the majority of funds in the HTF come from taxes paid by consumers on gasoline sales. The money granted to each state is determined by how much money it contributes to the HTF. Some states are considered donor states, meaning that they contribute more money to the HTF than their transportation departments receive in federal funding. This system was established in 1994 with the adoption of a National Intermodal Transportation System (NITS) policy (Fiore & Stafford, 1995).

The signing of ISTEA made several Federal programs significant to bicycle planning. These programs are the National Highway System Fund, the Surface Transportation Program, the Congestion Mitigation and Air Quality Improvement Program, the Federal Lands Highway Fund, the Scenic Byways Program, the National Recreational Trails Fund, Section 402 Funding, and Federal Transit Funding. With the exception of the Federal Lands Highway Fund, all of these programs require that the state match funds to pay for a portion of the project.

National Highway System (NHS) Funds are available for bicycle facilities near the National Highway System, provided that the roadway is not part of the Interstate Highway System. The roadway must be part of a state or MPO initiative and must be for transportation purposes rather than recreational purposes. In cases where NHS funds are used, the federal government will contribute as much as 80%. State and local agencies are responsible for the remaining 20% (Federal Highway Administration, 1993).

Surface Transportation Program (STP) dollars can be used for construction or nonconstruction projects related to the practice of safe bicycling. STP funds constitute about 33% of ISTEA. As with NHS funds, STP funds are available for projects that promote transportation versus recreation. In addition, STP projects must be associated with an overall State or MPO plan. Of all the STP funds that a State receives, 10% must be used for Transportation Enhancement Activities (TEAs). There are ten defined TEAs, two of which apply to bicycle and pedestrian projects. One, funds can be used to provide for bicycle and pedestrian facilities. Two, funds can be used to preserve abandoned railways for the building of bicycle and pedestrian facilities in the future. TEAs had an enormous impact on the use of Federal funds for bicycle and pedestrian related projects. Between 1990 and 1997, the amount of federal dollars used rose from 8 million to 265

million (Surface Transportation Policy Project, 1998b). Surface Transportation Programs have the same Federal, State and Local matching requirements as NHS.

The Congestion Mitigation and Air Quality Improvement (CMAQ) Program funds have the same provisions as STPs. The moneys can be used for construction or nonconstruction projects and follow guidelines established by a State or MPO plan. They must be for transportation rather than recreational purposes. Again, the Federal government's maximum contribution for an eligible CMAQ project is 80%.

Federal Lands Highway funds carry the same stipulations mentioned for the CMAQ, STP, and NHS programs. However, Federal Lands programs are fully funded by the federal government.

ISTEA set aside funds to establish a Scenic Byways Program which designates highways and roads as scenic or All-American. Ten percent of these funds are available for bicycle and pedestrian facilities along highways. These programs are for construction rather than nonconstruction purposes. They may be for transportation or recreational use. The Federal contribution for Scenic Byways programs is 80%.

National Recreational Trails Funds can be applied to an array of recreational projects for bicyclists and pedestrians. Funds may also be used for other nonmotorized activities and motorized uses. These projects must follow the guidelines of each state's outdoor recreation plan pursuant to the Land and Water Conservation Fund Act. The funding distribution for this program is more complex. Of the total funds available, 50% is split equally among the 50 states. The distribution of the other 50% is determined by looking at the amount of off-highway fuel consumed in each state. Of the total funds received by a state, 30% must go toward nonmotorized projects. Another 30% is dedicated to motorized uses, and the remaining 40% is allocated for trails in general. No matching state funds are required for National Trails projects for the first three years of the project. After the first three years, the state pays a portion based on the tax revenue from the off-highway fuel purchases.

Section 402 funding is allocated to projects which concentrate on the safety of bicyclists and pedestrians. For example, these funds can be used to initiate safety education programs for children in the community. The state matching requirement for Section 402 funding is a minimum of 25%.

The last Federal program is Federal Transit Funding. This provision allows for the funding of bicycle and pedestrian accommodations near mass transit. For example, these funds can be used to provide bicycle racks or shelters near transit facilities. In addition, mass transit vehicles can be equipped to carry bicycles. The state matching requirement for such projects is only 10%, the lowest of all the aforementioned programs that require a state contribution (Federal Highway Administration, 1993).

Critiques of ISTEA

As with most any Federal program, there are opposing views regarding ISTEA's success. Generally, ISTEA is seen as a positive step towards the implementation of transportation alternatives. In 1996, Howard Maier, Executive Director of the Northeast Ohio Areawide Coordinating Agency said,

“In much of the discussion about ISTEA, a point that is sometimes overlooked is that ISTEA works. With all of its apparent complexities, during its short five-year duration, ISTEA has helped improve the transportation infrastructure” (Camph & Siwek, 1999).

Yet, there are some critics who find problems within the structure of ISTEA. According to Fiore and Stafford (1995),

“ISTEA is not the flexible funding mechanism the government intended it to be. The sources of inflexibility include the magnitude of the state-matching share, the inability of states to bank and leverage federal funds (for long terms), the dictates on how FAHP fund must be allocated, and the restrictions on placing tolls on existing interstate highways to generate a state's matching share” (p. 271).

There are still too many restrictions on how States can use the money they are allotted. In addition, ISTEA requires that funding be within reasonable means of attainment in order for a program to be included in a long-range state or MPO plan. In many cases, capital-intensive projects must be omitted from plans because officials do not know where the money will come from.

TEA-21

Although there were criticisms of ISTEA, the legislation paved the way for alternatives to the highway system. TEA-21 mainly affects planning on the local level by granting even more money to states than was allocated by ISTEA. TEA-21 also creates new programs that encourage bicycle and pedestrian projects. Richard Martinez, Bureau Chief of Policy and Planning for the Connecticut department of transportation says, "If ISTEA was a sea (of) change, then TEA-21 is a validation of ISTEA's changes" (Camph & Siwek, 1999). TEA-21 attempts to continue the work began by ISTEA, creating alternative transportation opportunities. TEA-21 mainly affects planning on the local level by granting even more money to states than was allocated by ISTEA. The following paragraphs will examine the structure, programs, revenue, and strategies that accompany TEA-21.

First, TEA-21 provides that all federal gas tax revenues from states go to the Highway Trust Fund to support transportation projects. TEA-21 guarantees to return at least 90.5% of those funds back to the state. (Surface Transportation Policy Project, 1998b). This issue was very important to donor states, who felt that the Northeastern states received the greatest benefit from ISTEA. Recall that donor states (located mostly in the South and the Midwest) are those which contribute more money to the HTF than their transportation departments receive in federal funding. TEA-21 gives greater attention to donor states by increasing their federal funding. For example, Virginia (a donor state) tied with Nevada to receive the fifth largest increase among the fifty states. While Virginia receives a 61.8% increase in funding, Massachusetts sees a 41.2% decrease

(Surface Transportation Policy Project, 1998b). This may appear to be a drastic difference. However, Massachusetts was the only state to see a decrease between ISTEA and TEA-21 funds. The average percent increase among the fifty states is 46.13%.

Second, major funding programs such as the Surface Transportation Program, Transportation Enhancement Activities, and the Congestion Mitigation and Air Quality Improvement Program continue to provide funding for bicycle and pedestrian facilities under TEA-21. New programs, such as the Transit Enhancements program, directly relate to bicycle facilities. Similar to Federal Transit Funding under ISTEA, the Transit Enhancements program can be used to provide bicycle racks at other transit stations such as bus depots, rail lines, and metros. This type of planning is vital to successful intermodal implementation.

In addition to retaining these major funding programs, TEA-21 authorizes the allocation of more money; 40% more than ISTEA. Between 1998 and 2003, TEA-21 will allocate 217 billion dollars to the states. As mentioned, Transportation Enhancement Activities (a subset of STP) had a dramatic impact on bicycle and pedestrian facilities between 1990 and 1997. Under TEA-21, Transportation Enhancements funds increase from 430 million to 650 million per year. This is roughly a 50% increase with the Federal government contribution increasing to as much as 95% (Surface Transportation Policy Project, 1998a).

For planners, one of the major changes between ISTEA and TEA-21 is the planning consideration list for states and MPOs. In response to criticisms that the ISTEA lists were too lengthy and detailed, TEA-21 developed a new list of factors to consider (see Appendix E). The new list encompasses almost all the same elements as the ISTEA lists. However, separate lists were not devised for states and MPOs. Instead, these planning agencies follow the same list of broad considerations. Overall this change is seen as a positive one in that it allows greater flexibility.

Critique of TEA-21

Since TEA-21 was passed in June of 1998, the effects of this program are difficult to measure. One potential weakness is the allocation of money within the states. TEA-21 made changes to transportation procedures at the Federal level. Hence, State and local agencies will see little change in procedure. Recall that TEA-21 especially helps the donor states. However, little guidance is provided as to how MPOs will use the money in metropolitan and urban areas within those states. Simply put, the power rests with the state. Shifting power to local agencies continues to be a challenge. Another weakness with TEA-21 is that “the failure to consider any one planning factor is not actionable in a court of law” (Surface Transportation Policy Project, 1998b, p. 22). For example, a court of law cannot rule that a transportation plan is void because it fails to promote energy conservation or protect the environment.

Because TEA-21 is patterned after ISTEA, several of the weaknesses of ISTEA continue to plague TEA-21. For example, all stakeholders must be included throughout the planning process. Often, the public is ignored until too late in the planning process.

Although TEA-21 mandates public participation, there is no mandate for a public hearing unless transportation enhancement funds are used. Finally, factor number four of the TEA-21 consideration list states that planning will protect and enhance the environment. Unfortunately, transportation facilities are often planned in stages since funding for the entire project would be impossible to obtain. Therefore, as stages are approved and constructed, the cumulative effects on the environment are discounted.

Chapter 6

A Case Study - Blacksburg, Virginia

Introduction

One of the best ways to illustrate the complex nature of the important issues related to bicycle planning is to examine one area and its bicycle system. The following chapter will first chronicle the history of planning efforts in the Town of Blacksburg, Virginia. Next, this chapter examines bicycle planning in Blacksburg with regard to four topics, addressing major issues (public participation, integration, construction, and funding) which have been presented in previous portions of this paper. Finally, opportunities for future bicycle planning will be explored.

History of Bicycle Planning in Blacksburg

Two motives prompted the initial planning of bicycle routes in Blacksburg in the early 1970's. The first stimulus consisted of an external force, the energy crisis that was taking place at the national level. Bicycle planning was a component of the overall plan to conserve energy in the area. Secondly, the growing student enrollment at Virginia Tech, a state university located in Blacksburg, significantly increased the number of cyclists (See Map 1).

As a result of these two stimuli, Blacksburg began a series of studies. In 1974, the town developed its first bikeway plan that dealt with bicycle operation and basic guidelines. A second plan, produced in 1975, augmented the first plan. This second plan dealt more with location and layout of the bikeway system. A third plan by the New River Valley Planning District (also produced in 1975), examined bicycle planning on a regional level. Also critical to early bicycle planning was the 1983-1993 Virginia Tech Campus Master Plan. Part of the Campus Master Plan explored the circulation patterns and connections needed to facilitate safe and efficient bicycle travel on and around the Tech campus. Next, the 1989 Bikeway Master Plan for Blacksburg, was designed to expand on all the preceding recommendations.

The 1989 Master Plan created the basis for the bike network seen today in Blacksburg. The 1989 Plan specified current and future nodes of activity. In addition, the plan identified the major functions of the bicycle network. First and foremost, the community desired a safe and convenient system. Second, this system should provide links between neighborhoods, public parks, and recreation facilities. Finally, the system should serve to unite all travelers including vehicles, cyclists, and pedestrians (Blacksburg Planning and Engineering Department, 1989).

Map 1: Blacksburg, Virginia and Surrounding Area



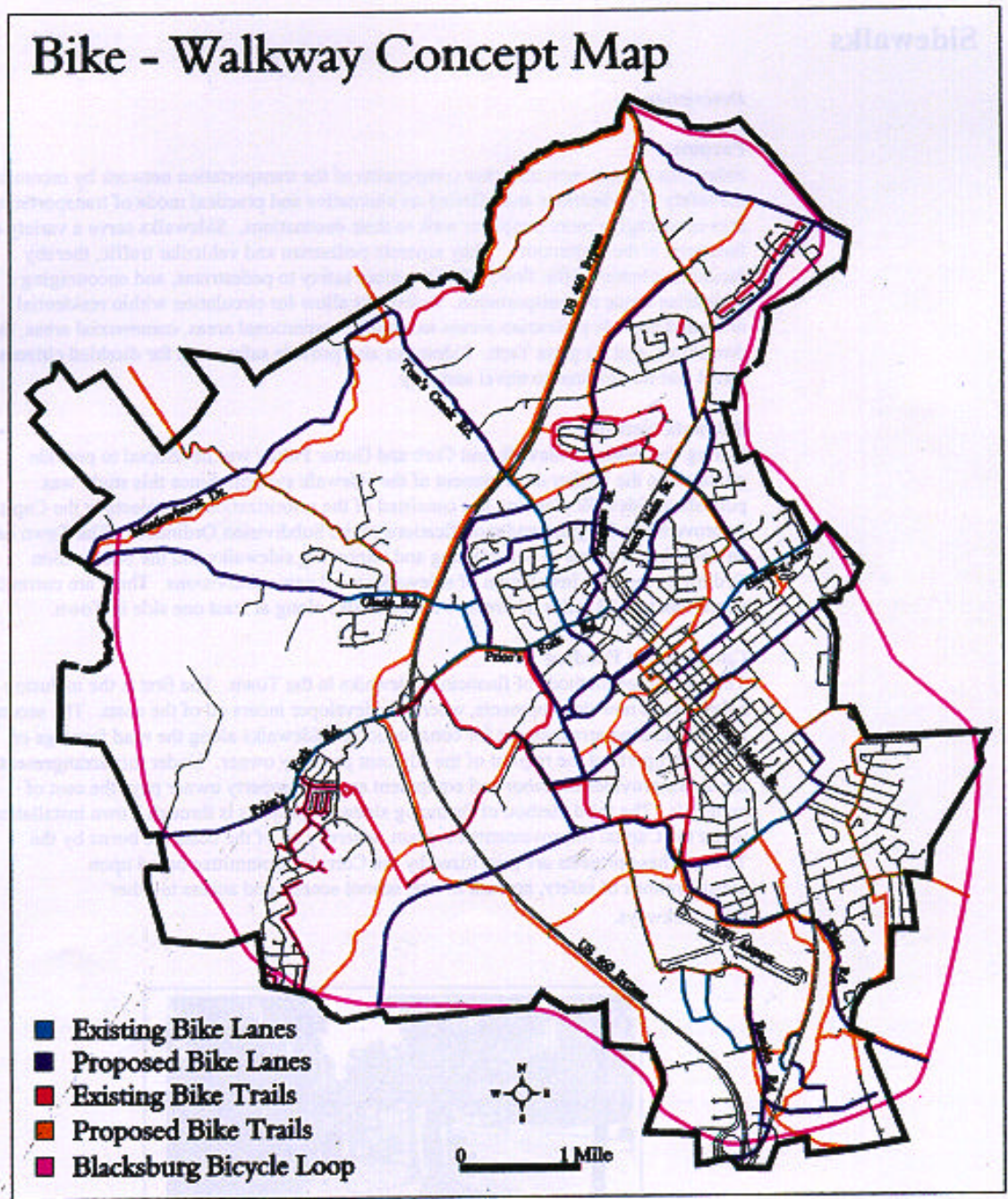
Source: <http://maps.yahoo.com/py/maps.py>

The latest Bikeway plan for the Town of Blacksburg appears in the 1996 Comprehensive Plan (see Figure 1). This plan gives special attention to both on-road and off-road facilities for the town. Currently, the on-road system covers about 14 miles of designated bike lanes. The remaining roads utilize a share-the-road procedure. Recall that a shared roadway is one in which a bicycle lane is not designated, but may be legally used by bicycles. The off-road system is nearly 18 miles long, extending into several of Blacksburg's larger neighborhoods. One goal of the bikeway program is to develop these two systems concurrently, providing proponents of both systems the opportunity to use both types of facilities (Blacksburg Planning and Engineering Department, 1996). Other priorities for the current bicycle plan include improved delineation of bike lanes and increased safety of multi-use trails.

Incorporation of Public Participation Throughout the Planning Process

The Town first actively sought public participation during the 1989 bikeway planning process. Today, public input is obtained in Blacksburg through several means. The Greenway/Bikeway/Sidewalk Corridor Committee provides the most influential means of input. This group, similar to a bicycle advisory committee, is a conglomeration of 11 citizens appointed by the town council. Originally, the bike and walkway advisory committees were two separate entities. However, in preparation for the 1996 comprehensive plan, these two groups were merged into one body, representing both greenway and bikeway interests.

Figure 1



Source: 1996 On-line Comprehensive Plan for the Town of Blacksburg,
<http://www.blacksburg.va.us/pande/complan/part1/prt1-09b.html>.

The Corridor Committee meets monthly to address complaints, entertain suggestions, and establish priorities for the bike and walkway systems in the town. Along with addressing town concerns, the committee coordinates with other stakeholders including Montgomery

county, the town of Christiansburg, and the Virginia Tech community. Blacksburg, although it's own entity, is located in Montgomery County (See Map 1). The town of Christiansburg, also within the boundaries of Montgomery County, is located approximately eight miles Southeast of Blacksburg on Route 460. The Corridor Committee works with Montgomery County and Christiansburg as frequently as possible to develop a regional system of bicycle routes. The planning process includes input from Virginia Tech on basically a project to project basis. One member of the Corridor Committee is employed at the University Architect's office, keeping the lines of communication open between the two groups. The Corridor Committee is primarily staffed by senior planner Marc Verniel. Another town planner and an engineer also attend the meetings. A community resource police officer, who is responsible for bicycle education, attends periodically.

Other opportunities for public participation include public forums such as town council and planning commission meetings. Public input can also be submitted on-line via e-mail to the Planning and Engineering Department.

Development of an Integrated Bicycle System

Although Blacksburg attempts to incorporate bicycle facilities into all transportation projects, there are a number of impediments when dealing with existing neighborhoods and developments. Varying street right-of-way widths often create problems because they are inconsistent and therefore do not allow for a continuous system. Obtaining extra footage to accommodate bicycle lanes is difficult because there are a number of property owners involved. In addition, there is substantial costs involved when widening streets to retrofit them for bicycle use.

On the other hand, Blacksburg places more emphasis on cycling than many other communities. The system is well connected as long as the on-road cyclist does not mind changing from striped roads to unstriped roads. The off-road trail system is also growing and future trails are planned to be integrated into the transportation system as a whole. There are several on-road and off-road options for cyclists. Many of the Blacksburg Transit buses contain racks so that riders are able to take their bikes with them. Providing opportunities to integrate modes of transportation is crucial to a connected system.

Construction and Design Issues

Blacksburg's current design standards, developed in 1991, mirror the AASHTO Guide. However, certain physical and demographic characteristics present challenges to the planning of bicycle facilities in Blacksburg. First, because both cyclists and walkers utilize some of the town's off-road facilities, traditional widths for walkways and bikeways are not sufficient in many cases. For example, the Huckleberry Trail (a paved trail for pedestrians and cyclists) is eight feet wide, the minimum width required. But, due to the mixed-use aspect of the trail, subsequent plans call for a width of ten feet. The ten-foot trail is also preferred because of the increasing number of users.

The next challenge facing planners is terrain, mainly in the form of steep slopes. The construction of new facilities must meet safety requirements while attempting to accommodate all types of users. Third, existing bikeways are poorly lit which limits their use for commuting. One goal for the Planning and Engineering department is to alleviate this problem on existing bikeways and provide adequate lighting on future projects. The final challenge involves maintenance of trails. Any impediment to visibility on the part of the motorist or cyclist can cause a collision. As with most localities, vegetation must be trimmed back in summer months to prevent visibility problems.



Images of the Huckleberry Trail - February, 1999

Impact of ISTEA and TEA-21

As expected, ISTEA made a significant impact on bicycle planning in Blacksburg. The increased funding, greater flexibility, and philosophy changes associated with ISTEA were crucial to efforts in Blacksburg. For Blacksburg, the most important aspect of ISTEA was the increased funding capability. In Blacksburg, this increase in funds paid for the Huckleberry Trail extension (see images above). The trail was lengthened from 3.5 miles to 6 miles, linking Blacksburg's public library to Christiansburg's New River Valley Mall. Second, ISTEA allowed for greater flexibility in how funds are utilized. ISTEA enabled Blacksburg to tailor funds to meet specific interests in the community, thereby improving both on and off-road facilities. Finally, the overall change in philosophy adopted by ISTEA was welcomed and practiced in Blacksburg even before the signing of ISTEA. The importance of multimodal facilities and intermodal connections is stressed. This philosophy begins with education and is incorporated into the Blacksburg school system. A community resource police officer visits the schools, teaching bicycle safety and rules for cyclists.

Although only passed in June of 1998, TEA-21 funds have been allocated for projects in Blacksburg. Transportation Enhancement Activity funds were given to the town in the amount of 150,000 dollars for the bicycle lane improvements to University City Boulevard. This is a major traffic route for students traveling from campus to University City Mall where the Math Emporium and Volume II Bookstore are located. These funds account for 80% of Phase I of the project. The town supplies the remaining 20% of the funds with an in-kind service match. This means that Blacksburg's 20% contribution is supplied in the form of services, labor, and equipment costs. The town will do all construction. Marc Verniel, Senior Planner for the town of Blacksburg, states that funding for this project was advanced due to University support (personal communication, February 25, 1999). The town was able to demonstrate that a significant number of users would benefit from these new lanes.

A second project involving TEA-21 funds is the South Main Greenway, which will run parallel to South Main Street from the intersection of South Main and Ellett Road to the Blacksburg Industrial Park. The large tract of land is located north of downtown Blacksburg, only about two miles from Christiansburg. This centrally located greenway will be accessible to citizens of both towns. The project includes a recreational bicycle trail, a pond, landscaping, and trailside amenities such as benches and picnic tables. The town has requested \$509,823 from the Virginia Department of Transportation. If the grant proposal is approved, construction will begin in May, 2000 and should take approximately one year.

The Virginia Recreational Trails Fund Program is made possible with TEA-21 funds. These funds, administered on the state level by the Department of Conservation and Recreation (DCR), are available to both private organizations and government agencies. Blacksburg plans to use the Recreational Trails Fund Program as a secondary source of funds to support the South Main Greenway.

Although federal funds are important to the development of bicycle lanes and trails in Blacksburg, local funds are utilized for many projects and improvements. Because there is community support for bicycle facilities, the town is able to allocate funds for bicycle projects. The community demonstrates its support for bicycle facilities through continued use and frequent participation in the development of future bicycle activities and programs.

Future of Bicycle Planning in Blacksburg

In the Bikeways portion of the 1996 Comprehensive Plan, Blacksburg established short term, medium term, and long term priorities for both on and off-road trails for new construction. In addition, action strategies were developed on 5 year and 25 year time lines. Whereas the action strategies are more general policies and programs, the priority lists are more detailed. Some of the short and medium term priorities have been realized and are described below.

Several projects are on the horizon that will extend and enhance the bicycle system in Blacksburg. As mentioned, TEA-21 funds have been acquired to extend existing bicycle

lanes from Tom's Creek Road (near the Virginia Tech campus) to incorporate University City Boulevard. The next project is the South Main Greenway which will include a recreational bicycle trail. A grant proposal has been submitted and funding is pending for this improvement. Given the success and immense use of the Huckleberry Trail, the Planning Department envisions extending the trail northwest, through newly acquired land, and up to Brush Mountain. Community support is strong for all three of these projects.

Chapter 7

A Case Study - Montgomery County, Maryland

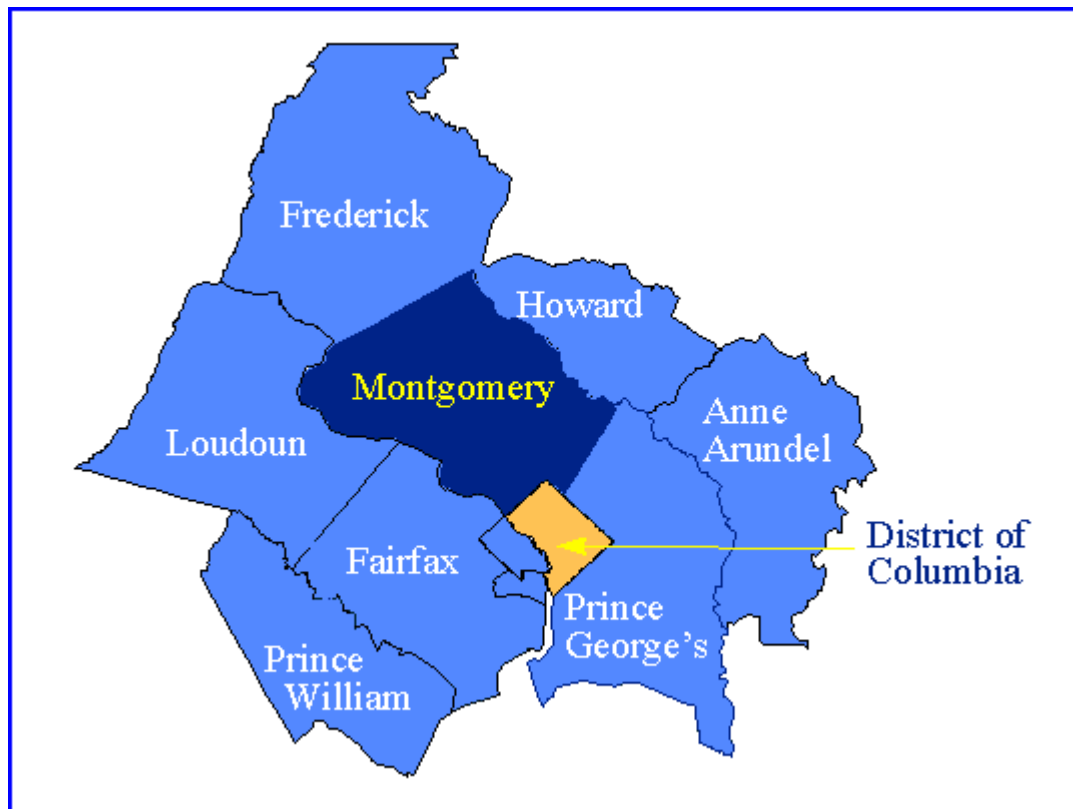
Introduction

The purpose of the second case study is to provide a much different view of bicycle facilities planning. The second case study addresses the same five topics as the first case study. However, this paper recognizes some major differences between this case study and the case study of Blacksburg. First, the government structure in place is very different. The material for this case study is based on a countywide trail and bikeway master plan prepared by the Maryland-National Capital Park and Planning Commission (M-NCPPC). The M-NCPPC, located in Silver Spring, operates through the Montgomery County and Prince George's County Planning Boards. Therefore, the bikeway master plan developed by the M-NCPPC is not contained within the comprehensive plan, as the Blacksburg bikeway plan is. The M-NCPPC possesses the authority to develop and maintain regional park systems in the designated Metropolitan District within Prince George's and Montgomery counties.

The second difference in these plans is the scale at which the planning efforts are based. The Montgomery County Plan not only encompasses a much larger area than Blacksburg's plan, but also represents the largest population of any county in the state of Maryland. Consequently, the increased number of stakeholders makes the process longer and more complex. The M-NCPPC bikeway plan was also developed within the context of a more urban framework than the Blacksburg plan. Montgomery County includes the cities of Rockville, Gaithersburg, and Tacoma Park. In addition, the county borders Washington, DC to the north and northwest (See Map 2).

A third major difference is Montgomery county's approach to land use development. In 1964, the M-NCPPC adopted a General Plan for Montgomery and Prince George's counties that advocated the "wedges and corridors" idea. This concept calls for development in transit corridors separated by low-density open space wedges. It also consists of densely developed downtown areas, used mostly for commercial office space, retail establishments, and cultural amenities. Corridor cities are approximately four miles apart with residential growth occurring around downtown.

Map 2: Montgomery County, Maryland and Surrounding Counties



Source: <http://www.clark.net/pub/mncppc/montgom/factmap/databook/location/locating.htm>

History of Bicycle Planning in Montgomery County

Although planning for recreational trails began in the 1930's, a Bikeway Master plan for the county was not developed until 1978. From that point, different portions of the county developed master plans for individual projects. Many of these projects were built, but were never incorporated into a revised version of the 1978 plan. In 1991, the county developed a guide to trails within the park system of the county. Although this guide was helpful, it failed to show vital connections between bikeways and trails outside of the park system. This led to problems with integration and accessibility. Clearly, a comprehensive update to the bicycle system was needed in order to integrate future bikeways and establish a vision for the county. This update and visioning process began in 1996 and continues today.

Incorporation of Public Participation Throughout the Planning Process

Because of the diversity of stakeholders, public input is critical to the Montgomery County planning process. Citizen participation during the 1978 and 1991 planning efforts was limited. For that reason, the M-NCPPC incorporated five major avenues for public participation in their latest planning process. First, the Montgomery Department of Park and Planning held two public workshops, one dealing with paved bikeways and a second dealing with unpaved trails. Here, staff members recorded comments regarding the current bicycle facilities. Second, the planning department mailed out flyers asking for public comment and announcing the dates of the workshops. Comment from the flyers and the workshops were later mailed out to the participants. The third means of

public input was several focus group meetings. These meetings were held with specific user groups in order to assess their needs and incorporate their suggestions. The fourth public participation avenue involved meeting with local organizations such as the Coalition for the Capital Crescent Trail, and County Bicycle Action Group to bring them up to speed on the current planning effort. Finally, the draft plan was brought to public meetings in Germantown and Silver Spring.

Development of an Integrated Bicycle System

The large population and extensive area that the M-NCPPC must serve impedes the integration of bicycle facilities in Montgomery County. Providing an interconnected system for nearly 850,000 potential users presents quite a challenge. Therefore, the M-NCPPC establishes priority of bicycle corridor development based on major destinations, usually along traditional transportation corridors used by automobiles. Such major destinations include high schools, libraries, employers of more than 500 persons, Metrobus, and Metro rail stations. The M-NCPPC Plan does not consider retail as a major destination point because most retail businesses are already located along the main transportation routes. Consequently, cyclists traveling to more remote destinations may lack the benefit of bicycle amenities.

The existence of the M-NCPPC is a major advantage from an integration standpoint. Because the M-NCPPC is committed to both Montgomery and Prince George's counties, planners can design facilities that encompass both jurisdictions. The M-NCPPC aims to provide vital links to destinations outside of Montgomery county including the Washington, DC area and the University of Maryland at College Park (See Figure 2).

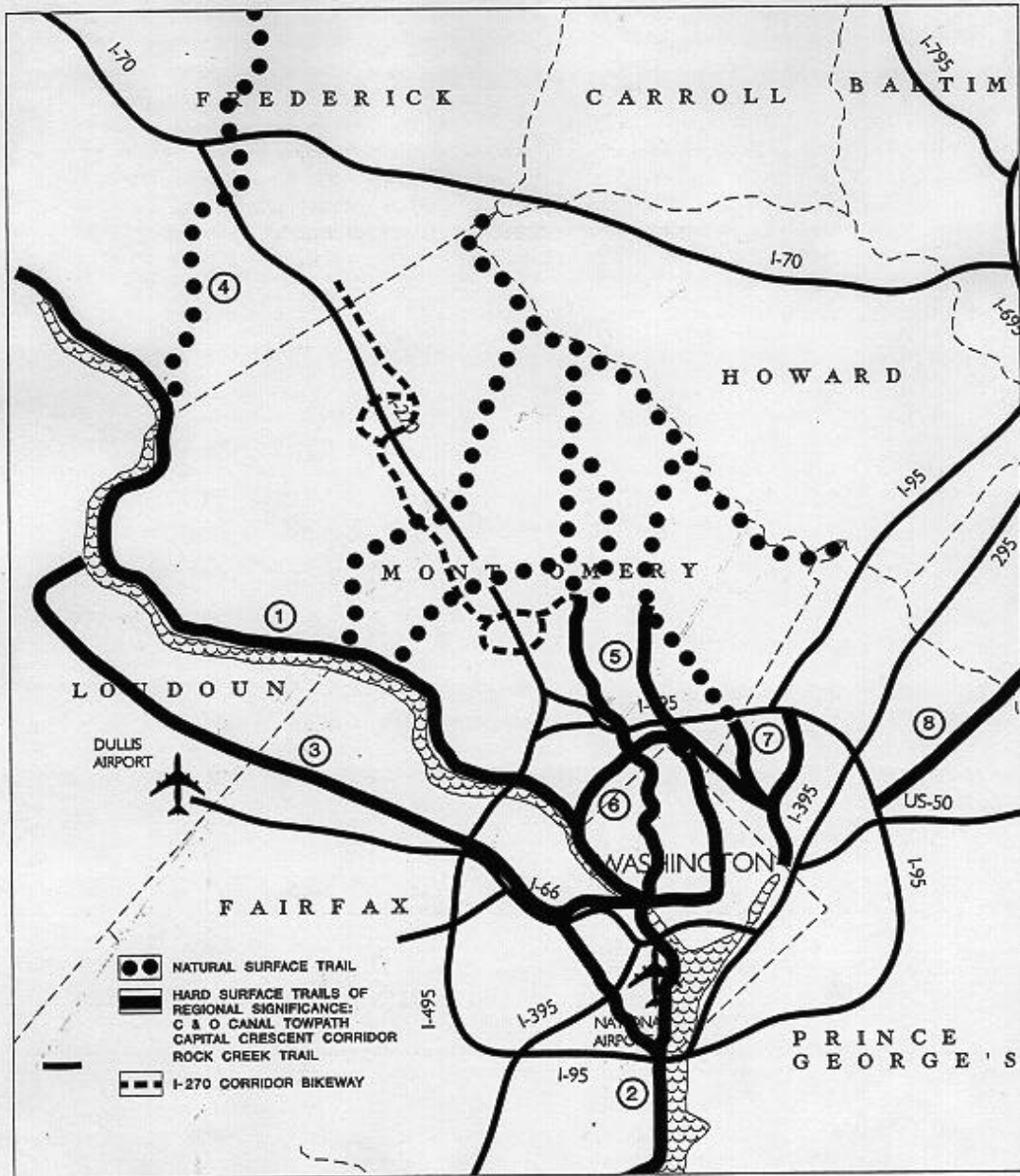
Construction and design issues

The most significant construction and design issue faced by the county are that bikeway design and signing standards are not compiled in a single document. "Different agencies have different perspectives on bikeways, particularly bikeways which are on-road" (M-NCPPC, 1997, p. 105). Although AASHTO guidelines are the recommended source, the need remains for a uniform set of standards to lessen confusion. This confusion has made the implementation of on-road facilities difficult. In order to be safe and effective, the signing and striping must be consistent throughout the county. The implementation of off-road facilities has been much more successful in the county because they are separate from other uses and many of the designation and striping issues do not apply. The county hopes to develop standards in cooperation with the Maryland Department of Transportation, the County Department of Public Works and Transportation, and the Park and Planning Department.

Figure 2

REGIONAL TRAILS MAP

Figure 20



Master Plan of Trails and Bikeways

Public Hearing Draft

Source: Maryland-National Capital Park and Planning Commission

Impact of ISTEA and TEA-21

ISTEA was again a significant force in bicycle facilities planning. Montgomery County received \$867,000 in ISTEA funding for the Capital Crescent Trail (Montgomery County Planning Board, 1998). Located in the southern part of the county, this trail provides a link from Georgetown to Bethesda and terminates in Silver Spring (See Figure 3). The first stage of the Capital Crescent was completed in 1996. This trail serves as a major route for cyclists and pedestrians for both recreational and transportation purposes.

TEA-21 funding has made a significant impact on bicycle facilities in Montgomery County. For example, TEA-21's first year of allocations include 8.5 million in funding for the Metropolitan Branch Trail (Hare, 1998). Commonly called the "Met Branch", this trail will stretch for nine miles along the CSX rail line and the Metropolitan Area Transit Authority-Metro. In addition, it will provide vital connections in the District of Columbia via the Capital Crescent and the Prince George's County trail system. The Met Branch is appealing to many cyclists because of its limited street crossings and access to several schools, metro stations, and retail centers.

Future of Bicycle Planning in Montgomery County

There are several defined goals envisioned for the Bikeway System in Montgomery county. A continued effort to plan bicycle corridors with consideration for land use patterns is favored. Using the "wedges and corridors" concept, the planning department aims to link major destinations throughout the county. In addition, future planning efforts should address the needs of both the advanced and basic cyclists, providing an appropriate balance between facilities for both groups.

Chapter 8

Conclusion

The planning efforts in Blacksburg, Virginia and Montgomery County, Maryland illustrate some important lessons which facilitate bicycle planning. Both case studies demonstrate the significance of regional cooperation. In Blacksburg, planners consult with an adjacent town, the surrounding county, and the university community. Recognizing that each of these entities has a stake in the planning process enables the town to make better decisions. In Montgomery County, the M-NCPPC coordinates projects which link the county with Washington, DC and Prince George's County. Regional coordination increases the number of users and improves integration.

Both case studies also demonstrate the importance of active public participation during the planning process. Workshops, public hearings, newsletters, and advisory committees provide the opportunity for public input. These activities help direct planning efforts so that bicycle facilities meet the needs of the community.

Throughout this paper integration, construction, and funding are identified as the most crucial issues to consider when planning for bicycle facilities. Although construction issues are pertinent concerns, they appear to be the easiest of the three to overcome. The AASHTO guide provides an excellent foundation for construction and design guidelines. The guidelines are applicable to most communities and provide options that do not require complicated maintenance procedures.

The primary difficulty associated with funding is the complex nature of the federal funding structure. However, most localities overcome this difficulty because they depend on federal and state money to fund their projects. Like Blacksburg, many communities can utilize the in-kind service match to offset costs. With funding mechanisms like ISTEA and TEA-21 more funding is available than ever before. These increased funds promote the implementation of new facilities and support improvements to existing facilities.

While funding and construction issues are relevant to bicycle planning, integration proves to be the most relevant issue pertaining to bicycle planning. Successful bicycle planning and implementation hinge on whether localities can integrate bicycle facilities into the existing transportation system. With that said, the following recommendations are encouraged with respect to the planning process. First, performance criteria must be evaluated based on how they affect integration. Coordination with other modes of transportation should be one of the primary considerations. Does a new facility provide opportunities that create *useful* connections for cyclists? The same evaluation must occur during the development of desired routes and types of facilities.

Second, localities must realize that transportation patterns are not static and plan accordingly. Patterns are constantly changing in order to meet the needs of those who are using the system. To accommodate for the transient nature of transportation patterns, the current situation must continue to be analyzed on a regular basis, not just on a project to

project basis. This regular analysis makes trends more apparent and functions to aid integration.

Finally, a monitoring step is needed within the current planning process. If older routes have been abandoned, then they need to be re-engaged or eliminated from the system. Monitoring can be the task of the bicycle advisory committee or the local planning agency.

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Appendix A: Definitions of Bicycle-related Terms

The Code of Federal Regulations, (title 23--highways, chapter I--federal highway administration, department of transportation, subchapter G--engineering and traffic operations part 652--pedestrian bicycle accommodations and projects) established the following definitions related to bicycle planning:

1. *Bicycle*: A vehicle having two tandem wheels, propelled solely by human power, upon which any person or persons may ride.
2. *Independent Bicycle Construction Project (Independent Bicycle Project)*: A project designation used to distinguish a bicycle facility constructed independently and primarily for use of by bicyclist from an improvement included as an incidental part of a highway construction project.
3. *Nonconstruction Bicycle Project*: A bicycle project not involving physical construction which enhances the safe use of bicycles for transportation purposes.

An additional source provides another definition, necessary to examine bicycle planning.

4. *Intermodal transportation planning*: A system of planning where key interactions between all modes of transportation are determined. This includes the identification of transfers, service interactions, and policies (Transportation Research Board, 1993).

Appendix B: Guidelines for an Acceptable Plan (State of Virginia)

1. The plan must be approved by the local government and/or if appropriate by the Metropolitan Planning Organization (MPO).
2. The plan should have goals, objectives, and policies.
3. The plan should have a map of the major trip origins and destinations of bicycle riders.
4. The plan should have a map(s) of the existing and proposed bicycle facilities.
5. Along with map(s) the plan needs to have narrative about each of the proposed facilities which includes Average Annual Daily Traffic (AADT), posted speed, and road widths for roads on which the selected routes have been placed.
6. A listing of the types of improvements and programs (e.g. on-road, off-road, encouraging commuting, and etc.) needs to be included.
7. Proof of public involvement in the development and approval of the bicycle plan should be shown. A Citizen's Bicycle Advisory Committee is recommended that includes citizens, some of whom are bicyclists. A public hearing to review the plan should have been held.

Appendix C: Planning Process Consideration List for States under ISTEA

1. The results of the management systems required pursuant to subsection (b).
2. Any Federal, State, or local energy use goals, objectives, programs, or requirements.
3. Strategies for incorporating bicycle transportation facilities and pedestrian walkways in projects where appropriate throughout the State.
4. International border crossings and access to ports, airports, intermodal transportation facilities, major freight distribution routes, national parks, recreation and scenic areas, monuments and historic sites, and military installations.
5. The transportation needs of nonmetropolitan areas through a process that includes consultation with local elected officials with jurisdiction over transportation.
6. Any metropolitan plan developed pursuant to section 134.
7. Connectivity between metropolitan areas within the State and with metropolitan areas in other States.
8. Recreational travel and tourism.
9. Any State plan developed pursuant to the Federal Water Pollution Control Act.
10. Transportation system management and investment strategies designed to make the most efficient use of existing transportation facilities.
11. The overall social, economic, energy, and environmental effects of transportation decisions.
12. Methods to reduce traffic congestion and to prevent traffic congestion from developing in areas where it does not yet occur, including methods which reduce motor vehicle travel, particularly single-occupant motor vehicle travel.
13. Methods to expand and enhance transit services and to increase the use of such services.
14. The effect of transportation decisions on land use and land development, including the need for consistency between transportation decision making and the provisions of all applicable short-range and long-range land use and development plans.
15. The transportation needs identified through use of the management systems required by section 303 of this title.
16. Where appropriate, the use of innovative mechanisms for financing projects, including value capture pricing, tolls, and congestion pricing.
17. Preservation of rights-of-way for construction of future transportation projects, including identification of unused rights-of-way which may be needed for future transportation corridors, and identify those corridors for which action is most needed to prevent destruction or loss.
18. Long-range needs of the State transportation system.
19. Methods to enhance the efficient movement of commercial motor vehicles.
20. The use of life-cycle cost in the design and engineering of bridges, tunnels, or pavement.

Appendix D: Planning Process Consideration List for MPOs under ISTEA

1. Preserving existing transportation facilities and, where practical, ways to meet transportation needs by using existing transportation facilities more efficiently.
2. The consistency of transportation planning with United States Government, State, and local energy conservation programs, goals, and objectives.
3. The need to relieve congestion and prevent congestion from occurring.
4. The likely effect of transportation policy decisions on land use and development and the consistency of transportation plans and programs with short- and long-term land use and development plans.
5. Programming expenditures on transportation enhancement activities, as required under section 133 of title 23.
6. The effects of all transportation projects to be undertaken in the metropolitan area, without regard to whether the projects are publicly financed.
7. International border crossings and access to ports, airports, intermodal transportation facilities, major freight distribution routes, national parks, recreation areas, monuments and historic sites, and military installations.
8. The need for connecting roads in the metropolitan area with roads outside the area.
9. The transportation needs identified by using the management systems required by section 303 of title 23.
10. Preserving rights of way for constructing future transportation projects, including identifying-- (a) unused rights of way that may be needed for future transportation corridors; and (b) corridors where action is needed most to prevent destruction or loss.
11. Ways to enhance the efficient movement of freight.
12. Using life-cycle costs in designing and engineering bridges, tunnels, and pavement.
13. The overall social, economic, energy, and environmental effects of transportation decisions.
14. Ways to expand and enhance mass transportation services and to increase usage of those services.
15. Capital investments that will result in increased security in mass transportation systems.

**Appendix E: Planning Process Consideration List
for States and MPOs under TEA-21**

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety and security of the transportation system for motorized and non-motorized users;
3. Increase the accessibility and mobility options available to people and for freight;
4. Protect and enhance the environment, promote energy conservation, and improve quality of life;
5. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
6. Promote efficient system management and operation; and
7. Emphasize the preservation of the existing transportation system.

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