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Tracing the Evolution of a Biking System in Arlington, Virginia**

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Active Living and Biking: Tracing the Evolution of a Biking System in Arlington, Virginia

When it came to biking in the early 1970s, Arlington County, Virginia largely resembled the rest of the Washington, D.C. area and other urban areas along the East Coast. Biking was a neighborhood-based activity for kids. Bike trails were not a major component of parks or recreational planning and programming. Bikeways were not part of transportation planning and development. Bike commuting was limited to a few daring riders who were regarded as a menace by most drivers. A steady evolutionary change in biking policy during the last three decades has yielded some of the nation's best biking assets in Arlington. It has a comprehensive, well-connected, highly integrated, well-mapped and signed system of shared-use paved trails, bike lanes, bike routes, and other biking assets such as workplace showers.¹ Recently the League of American Bicyclists designated Arlington County as one of thirteen "Bicycle-Friendly" communities (League of American Bicyclists 2003). In addition, a recent major study by the Virginia Department of Transportation (VDOT 2003) generally cites Arlington as having a superior bikeways and connectivity relative to most other parts of Northern Virginia.²

In contrast, most other areas in the region lag behind. For example, Arlington and two neighboring counties – Fairfax County, Virginia and Montgomery County, Maryland – share many attributes and the same pro-bicycling interests – in fact often the same groups and people –

¹ Our study largely ignores biking facilities that are primarily recreational in nature such as mountain-bike trails, some unpaved park trails, and velodromes. Since different groups use terms differently. In this report we use these terms as follows: Biking Assets – A quite general term that includes bikeways and other resources contributing to biking such as biking maps, signage, bike racks, bike lockers, showers for commuting bikers, etc.; Bikeways – Bike trails, bike routes, and bike lanes; Bicycle Trail or Path: A separated right-of-way normally designated for non-motorized shared-use where cross-flows by motorists are minimized; Bicycle Lane: A restricted right-of-way designated for the use of bicycles on which through-travel by motor vehicles or pedestrians is not allowed, but on which cross-flows by motorists, for example, to gain access to parking facilities or associated land use, may be allowed. Bicycle Route: A shared right-of-way usually designated as such by signs placed on vertical posts or stenciled on the pavement and which shares its through-traffic right-of-way with motor vehicles or pedestrians.

² Our study focused on biking but often, though clearly not always, biking and pedestrian interests coincide. It is thus not surprising that Arlington is also cited as a good community for walkers (McCaffrey 2005).

have actively pursued improved bikeways in each county during the same period. Yet today Fairfax County's biking system is unmapped, sporadic, and lacks connectivity. Montgomery County does have some very good biking assets, though without Arlington's level of connectivity and integration.

Understanding the conditions that led to Arlington's biking system can provide lessons in the strategy and tactics of active living politics. Thus in this article we examine the conditions and factors that led to Arlington County's biking system.

Literature and Methods

The literature on active living and the built environment is well understood and needs little elaboration here. Obesity and low physical activity are strongly linked (Catlin et al 2003; USDHHS 2001) and there is increasing evidence that the built environment can inhibit or enhance activity levels among all age groups (Perdue et al 2003; Frank and Engelke 2001; Frank et al 2003; Handy et al, 2002; Ewing et al 2003; Humpel et al 2002). Bicycling has long been recognized as an activity with important health benefits (Pucher and Dijkstra 2003) and the provision of high quality facilities substantially increases biking for local travel and recreation (Ewing and Cervero 2001).

Arlington's biking system did not come about through a single or even small set of initiatives. Rather the system evolved through a series of events. Likewise the biking policy process in Arlington only vaguely resembles a linear stage-to-stage process. We found that the "garbage can" model of policy making (Cohen, March & Olsen 1972; Kingdon 1995; Nelson 1984; March and Olsen 1989; Rochefort and Cobb 1994; Jones 1994) best describes how bicycling issues came to be on Arlington's agenda and how problems, solutions, and politics

converged to produce particular policy changes. The garbage can model is well adapted to case studies, and offers a disciplined structure for explaining how issues emerge onto the public, institutional, and decision agendas. As Rochefort and Cobb (1994) argue, the approach is especially useful in tracing the strategy and tactics of various actors as they attempt to influence the way issues are framed, solutions are developed, and agendas are controlled. While preferred for explaining the politics of agenda setting and decision making, the Garbage Can Model does not adequately deal with situations where, as here, policy change occurs as an evolutionary process rather than a single event. Salamon's (2002) concept of "tools of governance" adds an important dimension to the cases. It argues that any policy involves a choice of one or more particular tools to carry it out. In these cases, the tools include master plans, capital budgets, subdivision and parks regulations, administrative offices, programming of activities and events, homeowners associations, public-private partnerships, intergovernmental agreements, contracts, easements, and deed covenants. The advantage of the tools approach is its ability to track the way in which tools have been used as policies have evolved, and to explore why jurisdictions used different tools, or used them in different ways.

In developing the case study we analyzed plans, regulations, budgets, administrative memoranda, maps, design and engineering specifications, photographs, and other documentary materials to construct both a timeline of actions and to provide information on the content and effect of various policy tools. We interviewed a very wide range of people who were involved in the development and implementation of biking policies, including public officials and citizen activists, to provide information about the political process and insight into the factors that produced particular outcomes.

Arlington Before Biking Reach the Agenda

Prior to 1970, bicycling was not a major concern of policymakers in suburban Washington counties. Arlington, at twenty-six square miles one of the smallest counties in the nation, was the region's most densely populated suburb. It had been formed in 1847 by the retrocession of Virginia's original portion of the District of Columbia. Home of the Pentagon, Fort Myer, Arlington National Cemetery, and a variety of other federal buildings and facilities, it housed a large contingent of the area's federal civilian and military workforce, much of which commuted across the Potomac to the District of Columbia. Its 1970 population was 174,284, and declined slightly during the 1980s before rebounding to 189,453 in 2000.

Arlington's development pattern in 1970 followed fairly standard pre- and post-World War II fashions—single-family subdivisions and enclaves of garden apartments along major highway corridors. Low-density commercial strips were located along major thoroughfares. By 1970 Arlington was a fully urban, developed community. Consequently new growth was primarily in the form of high-rise office and residential redevelopment in Rosslyn, across the Key Bridge from Washington, and at Crystal City, constructed over an old railroad yard near National Airport.

Arlington was the first Virginia county to adopt the county manager system of government. There are no municipalities within its borders. Because its county highway department existed prior to the creation of the predecessor of the state Department of Transportation, Arlington is one of only two Virginia counties that maintain their own roads, except for primary state, U.S., and Interstate highways.

The five-member County Board is elected at large and during the 1960s and 1970s Arlingtonians for a Better County (ABC), a local party with no formal affiliation with the two major national parties, elected a majority of its members. Since Arlington's population contained a high proportion of U.S. civilian and military personnel, the ABC was critical to their effective civic engagement and ability to seek and hold local elective offices. Though officially nonpartisan and with some Republican members, ABC's leaders were liberal Democrats. The Democratic and Republican parties often ran candidates, and occasionally elected county board members. A conservative non-partisan opposition party, the Arlington Independent Movement (AIM) tended to be more successful, but like the ABC's Board members, AIM officials were committed to the county manager system. In a civic culture deeply influenced by the practices and values of the federal civil service, elected board members tended to be attentive to the concerns of citizens and deferential to their professional administrators and to expect them to initiate as well as implement policy. The county was regarded as an outpost of liberalism in a state dominated by the ultra-conservative, segregationist Byrd Machine.

In 1970 Arlington had only 4.3 miles of unpaved hiker-biker trail in Four Mile Run Park, built for recreational use in 1968. In 1973 the National Park Service constructed the Mount Vernon Trail along Arlington's eastern border south to George Washington's home in Fairfax County. The trail ultimately included connections to the 14th Street and Theodore Roosevelt bridges in Arlington. Otherwise Arlington offered little in the way of formal biking assets early in the 1970s.

The Politics of Biking Policy in Arlington

Several factors and forces converged in the early 1970s to cause some Washington area officials, especially in Arlington, to take an interest in biking facilities. The area had been through a period of tumultuous debate over proposed freeway facilities. Most had been defeated, but some major roadways remained under active consideration and litigation. Construction was beginning on the Metrorail system, which was expected to have a profound effect on both commuting patterns in the region and on development in the vicinity of many of the stations.

The Washington Metropolitan Area Transit Authority (WMATA) was planning two Metro lines through Arlington—the Blue Line, headed south through the Pentagon and Washington National Airport before exiting Arlington for Alexandria and southern Fairfax County; the Orange Line headed west through Rosslyn exiting at Arlington’s northwestern boundary. (A third line—Yellow— now services the Arlington though mainly at the same stations as the Blue Line.) Developers had already produced new, intensive development at proposed Metro stations in the Arlington neighborhoods of Crystal City and Rosslyn, and county planners were preparing plans for development or redevelopment of areas served by other transit station areas on both lines.

In addition, plans were underway to create an interstate highway traveling eastbound from western Virginia through Arlington into the District of Columbia. I-66 proved extremely controversial in the county (indeed its presence and potential expansion remains controversial there today). The combination of the new highway and Metro ultimately meant Arlington was destined to be one of the most transportation intensive places in America. As we will see, this did bring some windows of opportunity for developing a biking system.

During the sixties, the second New Towns Movement³ was having an influence on public expectations for community design. Reston, Va., Columbia, Md., and Montgomery Village, Md. were setting examples that encouraged greater emphasis on walking and biking in local transportation. Interest in biking also rose with advances in bike technology and the popularity of ten-speed bikes. In 1972, the Washington Area Bicyclists Association (WABA) was formed and began to build an area-wide membership. It organized a series of biking events and began to lobby Metro, Congress, local governments, and the National Park Service for better biking facilities (Gessel 1987).

In the mid-sixties, the U.S. Department of Transportation was formed and with it there was a new emphasis on multi-modal transportation. And the 1972 Federal Aid Highway Act, for the first time, authorized some funding for bike facilities. In 1973, the first energy crisis produced a spike in gasoline prices and long lines at filling stations, furthering interest in alternative forms of commuting to work.

Getting Biking on the Arlington Agenda

In Arlington, solutions preceded identification of a specific local problem or local political demand for bike facilities. Although there were a few bicyclists and biking club members active in the county, there had been no major effort on their part or that of health or recreation activists for an extensive bike system. Bike commuters were few and not organized. As noted earlier, bike trails were not a major component of parks or recreational planning and programming.

³ Intellectually anchored in the Garden Cities movement of the early 20th Century and the experience of American planned communities such as Radburn, NJ and the Greenbelt towns built during the New Deal, new towns were designed to balance workplaces and homes. They emphasized pedestrian access and amenities, mixed uses, and diversity in incomes and housing, and integration of the built environment with natural features.

Bicycling reached the policy agenda in Arlington when two government officials recognized an opportunity to make a substantial change in transportation policy and became policy entrepreneurs. Arlington County Transportation Department Director H.S. “Hank” Hulme remembers meeting with County Manager Bert Johnson early in 1972 to discuss a number of emerging transportation issues. Metro was imminent, and county planners were thinking about how to plan for its potential for redevelopment of the county’s transit corridors. The construction of I-66 would divide neighborhoods, change county traffic patterns, and induce more through traffic from Fairfax and Loudoun counties.

Although discussions of highways and transit were still in their early stages in 1972, Johnson wanted to use these events as an opportunity to broaden the county’s approach to mobility in a county that was being transformed from a first tier suburb into a part of the region’s urban core, consistent with its history as part of the original District of Columbia. Both Johnson and Hulme recognized that big changes were on the horizon in transportation policy. The creation of the U.S. Department of Transportation would increase pressure on the states for more comprehensive and balanced approaches using different modes of transportation. A former County Board member, Alan Dean, had, as a senior Bureau of the Budget official, played a central role in creation of the new department and had become its Assistant Secretary for Administration. He also remained an influential civic leader in shaping the views of Arlington County Board members. Recognizing the confluence of these factors, Johnson told Hulme that he should be thinking about a full range of mobility measures -- not just roads and Metro, but also bikes and walking -- to serve county commuters and other travelers.

Johnson had no specific solution in mind. That was to be Hulme’s job. The transportation director was handed a virtually blank slate and told, in effect, to be the policy

entrepreneur for a multimodal transportation system. Hulme's first action was to reassign some of his transportation engineers to a planning section to develop a multi-modal system, of which sidewalks, bike trails and lanes would be one component, providing opportunities for people to walk and bike to Metro and to work.

Thus, the planning and production of biking facilities were initiated, not as a discrete issue to be addressed as demand for recreational trails appeared, but as a component of a reframed county transportation policy, which shifted from almost exclusive reliance on automobile travel to multi-modal approaches designed to reduce or at least slow the growth of auto usage. In the process, Hulme reframed bicycling as a transportation mode serving commuters as well as recreational bikers. He also institutionalized concern for it as a basic element of the county's transportation system, which would be regularly addressed through the bureaucratic routines of planning and capital budget requests. Thus, bicycle facilities were made the mandate of transportation planners rather than the exclusive domain of the park planners. And given Arlington's unified managerial system, in which all agencies reported to the County Manager, clear and unambiguous priorities could be established and projects could be programmed, subject only to the decisions of the County Board.

Building the Arlington Biking System

Hulme's transportation department moved quickly. It completed the county's first commuter bikeway in 1973 -- a 1.2-mile connection to the Spout Run Parkway, providing access to the new office and high-rise residential complex in Rosslyn. As his staff worked on the biking component of county transportation strategy, they drew on the county's participatory civic culture, seeking advice from local bike enthusiasts, some of whom were members of the newly

formed Washington Area Bicyclist Association (WABA). Initially, the advice from bikers was informal, starting with cyclists Hulme happened to know personally.

In 1973 Johnson and Hulme asked the County Board to establish an eleven member Bicycle Advisory Committee to provide a formal voice for citizens in the planning, design and construction of bike trails, parking, and street access. The Committee also offered advice on development of the first comprehensive Master Bikeway Plan, produced in 1974 with substantial public participation.

The Master Bikeway Plan was amended in 1977 to include projects that were completed during that period. The plan now contained details about the existing facilities, and listed those that had been approved for construction and those planned for the future. The committee was also helpful in the development of design standards for bikeways and lanes, and in designation of bike routes.

The advisory committee became an effective advocate for the expansion of the system and improvement of its quality and a key policy instrument in building a core constituency for biking in Arlington. Biking now had an institutional base, both inside the government and in the public. As a consequence of continuing consultation with both bikers and neighborhood associations, little public opposition to augmentation of the system has been encountered. Routes or facilities that encountered strong opposition were either dropped or modified to meet objections. The advisory committee was also helpful in reconciling the interests of commuter and recreational bikers and in sustaining the support of the County Board for trails and lanes. Committee members also proved effective in sustaining support for bike facilities by County Board members, who are regularly invited to join in riding trails and routes to familiarize them with the system and learn from riders about its usage for commuting and recreation. As a

consequence of the committee's work in building community support, there always have been at least three votes on the County Board for construction and maintenance of bike facilities. The committee, thus, provided a self-replicating political stream within the county's governance system for advocacy, protection, and expansion of the system. That major facilities, such as the Custis and Washington & Old Dominion trails (discussed below) are extensive and, with connections to the National Park Service trails, can serve both purposes, also made conflicts over resource allocations avoidable.

Arlington developers never mounted significant opposition to the creation of bikeways. Arlington was a fully developed urban county by the 1970s. This meant then that, in general, developers played a far less prominent, or at least a different role in Arlington than in, for example, the less developed Montgomery and Fairfax counties. Contemporary large-scale development in Arlington occurs through the occasional redevelopment of areas into dense mixed-use neighborhoods clustered around a metro stop, such as Ballston and Clarendon. Integrating bikeways into these mixed-use neighborhoods proved relatively easy.

On the other hand, the fully developed nature of Arlington meant that bikeways had to be integrated into the pre-existing roadway, neighborhood, and park system. Bikeway plans could not be part of new development with, for example, the construction of roadways appropriately designed for the inclusion of bicycles.

In many respects, 1977 was the year bicycling achieved high salience and a permanent and prominent place on the Arlington transportation agenda. Due to challenges to its environmental impact statement, U.S. Secretary of Transportation William Coleman rejected the initial 1974 plan for I-66. A new four-lane, restricted design was proposed. As approved by Coleman in 1977, the revised project included a number of features designed to reduce or

ameliorate environmental effects. These included a depressed roadway, a tunnel through Rosslyn, a right-of-way-for Metro's Orange Line together with a transfer of part of Virginia's federal highway funds to help with construction of the line. Most critically for our purposes it included a landscaped and lighted bike trail for the four-mile length of the highway through Arlington. The resulting Custis Trail was less a response to demand for it than provision of an environmental and recreational benefit to offset the impact of the new highway on the county's park system. But it provided a connection to the forty-five mile Washington and Old Dominion Trail that was being built in an abandoned railroad right-of-way by the Northern Virginia Regional Park Authority, thus providing a major commuter route that could connect with Washington and Alexandria. Its popularity for both commuting and recreation further enhanced support for bicycling and bike facilities in Arlington.

Hulme appointed a staff member to oversee the maintenance of the growing trail system and to work directly with bike proponents. The job metamorphosed into the County Bike Coordinator, responsible for planning, administration, advocacy, programming, and community and interagency relations for the biking system. The office has become the focal point for promotion of biking. It organizes special events, such as Bike to Work Day and Arlington Community Bike Ride, publishes and distributes 5,000 bike system maps annually, works with schools on bike facilities, safety education, and information on safe routes for biking to schools. Together with the advisory committee, the staff position further institutionalized the county's commitment to biking and provided mutual reinforcement with the advisory committee.

Bike trails were regularly included in Arlington's capital budgets, and Hulme and his successor have followed a strategy of *incremental* development, adding mileage as funding allowed, and building trails below ultimate standards to get them in place. One of Hulme's

practices was to keep adding to the system, even in tight budget years. Trails were sometimes initially built six-feet wide in order to provide more mileage with limited funds, and expanded to an eight-foot standard width in later years when they were due for repair or replacement. Other trails were laid out and given a crushed gravel surface, then programmed for hard surfaces in later years. The operating philosophy was “to do something, then come back later when funds were available and do it right.” Bike trails were added to storm sewer projects and other public works projects where they could be constructed at low marginal cost.

Hulme worked closely with state highway officials in marking bike lanes and providing signage on state highways, for which the county provided the funding and labor. The National Park Service permitted the county to build trails and connections across federal parkland to connect with its linear trail system along the George Washington and Mount Vernon Parkways. The only resistance came from the Department of Defense, which would not permit public access trails across Ft. Myer, or a bikeway to the Pentagon.⁴

The opening of Arlington’s Metro stations increased public interest and support for multi-modal transportation. WMATA has cooperated with Arlington in providing both bike lockers and racks at four stations and racks at three. No bike parking is provided at four stations: Arlington Cemetery, Pentagon, and Crystal City, on the Blue/Yellow lines and Court House on the Orange Line. Metro also permits riders to bring bikes onto trains in off-peak hours, and bicycles can also be loaded onto Metrobuses.

The completion in 1982 of the 8.5-mile Custis Trail, adjacent to I-66, and its connection to the W&OD trail and the National Park Service trails along the Potomac River raised the visibility of the Arlington system, as it received national and regional awards for its design and

⁴ Ironically, since Arlington was forced to build its biking system around Ft. Meyer and the Pentagon, the system was largely unaffected by toughened security measures taken in the wake of the September 11, 2001 attacks.

usefulness. Biking and bike facilities had become a key component of Arlington development and civic life. The advisory committee and other Washington Area Bicyclists Association members had a substantial role in designing the I-66 bike trail, which includes center striping and lighting, as well as bicycle-accessible bridges to connect the bikeway with communities on the opposite side of the freeway. The Virginia Department of Highways took many of WABA's suggestions, including widening certain parts, eliminating dangerous grades and curves. The Virginia committee of WABA also won improvements to the Mt. Vernon bike trail and influenced the W&OD trail, which crosses several jurisdictions.

The significance of biking received official recognition in the 1986 Master Plan of Transportation, which replaced the 1974 Bikeway Plan and included sections laying out principles for five modes of travel: street, transit, paratransit, bikes, and pedestrian systems. The plan both integrated these modes and provided the design for a highly connected system, for each mode of travel such as biking, and among all modes. The advisory committee and WABA were key participants in the development of the biking sections of the plan, providing both useful advice on routing, standards for different parts of the system, and support for its adoption and legitimacy among both serious and casual commuting and recreational cyclists.

The Master Plan is a critical foundation tool of Arlington's biking policy. It established the conceptual and legal base for development of other policy tools that promote biking. In the 1980s Arlington planners and the County Board adopted an "urban village" strategy for managing its growth, most of which depended on redevelopment of eight areas served by Metro stations. Subdivision, site plan, building, and parking regulations were revised to encourage bicycle commuting. New office and commercial buildings are required to provide indoor bike parking, employee locker rooms, and showers. Apartment buildings are required to provide

covered visitor parking for bikes. Under site plan regulations, specific conditions are negotiated for each project, but automobile parking requirements can be reduced in locations close to transit and may be further reduced if bicycle facilities are provided. Some businesses have been allowed to have fewer spaces for bikes if they are unlikely to generate high levels of bike usage.

In 1994, the County amended the transportation master plan to include an addition of twenty-four miles of new bike trails and lanes at a cost of \$7.3 million. Most of the trail system was constructed, but only two miles of bike lanes had been marked by the end of the decade. A 2001 amendment to the master plan was developed after transportation staff and advisory committee conducted a street-by-street analysis of opportunities for bike lanes on all the county's arterial roads. It proposed adding twenty-three miles of bike lanes at a cost of \$250,000 over the ensuing five years. An earlier draft of the amendment had been reviewed by the county's Neighborhood Conservation Advisory Commission, the Arlington Civic Federation, and the local civic associations where bicycle lanes were proposed. All strongly approved of the overall proposal though there was opposition to one segment (which was subsequently dropped from the final plan). While there is some division within the biking community over the value of bike lanes, the plans were approved with no public objections by the Transportation Commission and the Planning Commission. These bike lanes were recently finished thus essentially completing the basic network.

The Arlington system currently includes thirty-six miles of paved, shared-use trails, twenty miles of bicycle lanes, and fifty miles of signed bike routes. More than 400 bicycle racks have been installed in county parks and commercial areas. These facilities represent an investment of more than \$16 million. Arlington is the only local jurisdiction that provides a stipend to its employees who bike or walk to work. The 2001 master plan amendment also

established a goal of increasing percentage of people that use bicycles as a means of transportation.

As Board and public support for bicycling has grown and the physical system has essentially been completed, new programming tools have been added. In 1990, the Department of Public Works established the Commuter Assistance Program (CAP), and assigned it responsibility for coordinating and directing various promotional activities for non-automobile commuting. CAP initially operated ‘commuter stores’ at the county’s busiest Metro stations, providing commuting information and selling various passes for various forms of public transportation. As it opened its third store, CAP added information on bicycling, telecommuting, and how ride sharing helps the environment. CAP added an Employer Services Program in 1995 staffed by a full-time professional to market and implement employer based transportation programs to employers. As this program also grew in popularity, CAP contracted with a private firm, Arlington Transportation Partners (ATC), to provide employer services designed to facilitate alternatives to auto commuting. Services related to employee biking include advice on providing bike parking, showers, and programs that provide a cash benefit to bikers in lieu of employer-provide parking, and organizing bike-to-work days. ATC also cooperates with WABA in promoting regional bike events. Another useful biking resource developed by the county is the website *Bike Arlington* (www.bikearlington.com), featuring a variety of resources for bikers.

Some General Lessons for Producing Biking Systems

The Arlington case offers some lessens for advocates of biking (and other active living components of urban development):

It's the Frame, not the Picture

During the 1970s bicycling policy moved onto Arlington's agenda. For Arlington, bicycle facilities began to be produced not in response to demand or to address a problem such as unsafe or inadequate bikeways. For all practical purposes there were none and no outcry from any substantial quarter for their provision. Rather, the provision of bikeways was a reframing of county transportation policy. They became a component of a new multi-modal approach to meeting the general mobility needs of the county's residents. In that frame, bicycling was viewed primarily as a form of commuting for adults and students, and secondarily as a recreational activity. It is significant that the first bikeway constructed in Arlington after adoption of the new transportation strategy was a commuter link from a business center to a parkway. The initial bicycle advisory committee was built around bike commuters. Even the Custis Trail, which has attracted a large and avid number of recreational bicyclists, was framed less as a recreational facility than as a transportation feature, compensating for loss of traffic lanes on I-66 by producing a more environment-friendly means of travel.

Gradually, as bicycling pedaled into Arlington's civic consciousness through the advocacy and public engagement of the advisory committee, the frame in which it was viewed subtly shifted. Careful work with community groups and schools in delineating bike routes along county streets broadened the constituency for bicycling. It had become a community amenity. Then, as Arlington undertook the redevelopment of the areas around its Metro stations from nondescript auto-oriented commercial strips into dense, pedestrian-oriented urban villages, the provision of bicycle facilities and linkages to the major bikeways such as Custis and Mt. Vernon were seen as attractive features of urban living. As a tool of multi-modal mobility, bicycle routes, racks, lockers, and showers for bike commuters in new offices became means of

reducing automobile traffic and parking. Finally, the increasing interest in and use of bikes reinforced the county's advocacy of biking, and the policy frame expanded to include commuting, recreation, urban design, and public health. As the physical system matured, more emphasis was placed on programs and promotion of biking as a form of active living.

Sustained Success Requires Institutionalization

Policy entrepreneurs are necessary but not sufficient for bike policy to succeed. Whether citizen advocates or public officials, they can open windows of opportunity, but sustained success requires institutionalization. In Arlington the presence in the government of a dedicated staff position to serve as an institutional advocate for bicycling facilities was crucial to keeping biking on the government's decision agenda and in maintaining momentum in the development and use of facilities. The successful bike coordinators served as internal proponents of biking as issues arose for capital projects, in the design of new development projects, development of routes and linkages among bikeways serving communities, recreational riders, and commuters, and for programs and events that build constituencies for biking. They were key staff in the development of master plans for bikeways. The coordinators also provided a liaison between their agencies and bike advocacy groups and staffed advisory committees.

The bike coordinators have performed another essential function in building trust between their agencies and advocacy organizations. This facilitated the development of an incremental strategy of facility development that permitted some bikeways to be developed at less than optimal standards during lean budget years and their upgrading to occur in later years when more funds were available. A close working relationship with advocates also has encouraged flexibility in the designation of routes along neighborhood streets, which are

essential to a well-connected system. The result has been an ability to make steady progress in the development of facilities, foster greater bike usage among a diverse set of riders, and build public confidence and support for both individual facilities and an integrated system.

Citizen Advisory Committees Foster Legitimacy and Support for Biking

Citizen advisory committees are vital tools in the development of biking systems. They serve functions that the bike coordinator and official policy entrepreneurs cannot. If well designed, as they especially were in Arlington, they can provide representation for the different kinds of bikers, fostering a comprehensive view of the needs of bicyclists and what a good system can provide. While a bike coordinator imbedded in the bureaucracy provides expertise and continuity in planning, budgeting, and the use of regulatory processes to advance biking, an effective advisory committee can provide public legitimacy to bikeway initiatives by serving as liaison to the diverse biker clientele, reconciling the interests of commuters and recreational riders, and working with neighborhoods to alleviate concerns about safety, privacy, or environmental issues. Finally, an advisory committee can do what a bureaucrat can do only at risk of discipline or termination: it can mobilize public support for projects and bring pressure to bear on elected officials to support both biking in general and specific projects. The presence of a strong and continuing committee in Arlington was an important complement to the work of public officials and staff, particularly in laying out a system of connected routes through residential neighborhoods.

Governance Structure Matters

Arlington has a relatively simple and unified governmental structure. All its administrative agencies report to the county manager and it has control of state roads in the county. Its governing board members are elected at large. Thus, the provision of all capital projects, administration of development regulations, and operation of marketing and promotional programs for biking were under unified direction. With support for biking from the top of the management system and its endorsement by the County Board, a coherent strategy could be developed and pursued. This governance structure is atypical in the Washington-area. For example, Fairfax County, Virginia has a similar administrative structure for county functions but it lacks similar authority over its roads thus dramatically complicating efforts to produce a comprehensive biking system. Plus its Board of Supervisors is elected from single-member districts, with only the chair of the Board elected at-large, which exacerbates NIMBY politics.

The Policy Tools Employed Affect the Outcomes and Support for Biking

The principal policy tools identified in this study include master plans, capital improvement projects and plans, development regulations and incentives, and promotional programs:

Master Plans

Master plans had significant roles in the development of the Arlington system. They identify and map the major bikeways and lay out long-range goals for different types of facilities. Functional master plans for bicycling in Arlington have also developed a classification system for bikeways, design standards for different classes, and criteria for selection of projects and their prioritization. Because of the public participatory process through which master plans are

produced, they tend to build support for their recommendations and create expectations for their implementation. Both functional master plans of bikeways and master plans for specific areas can also contain language and/or graphics that can guide the administration of development regulations, such as zoning, subdivisions, and site plans. They are also important guides in the capital improvement process, often establishing priorities of importance and timing for bikeways.

Subdivision and Site Plan Regulations.

Although master plans are regarded as advisory in Virginia, they have great weight in the subdivision process. Arlington County includes in its regulatory procedures requirements for specific information on the provision of bike facilities, such as parking, trails or lanes, and lockers and showers in office buildings. Consistent with its framing of biking as a component of its multimodal transportation strategy, developers are also expected to provide support for information services on alternatives to automobile commuting, and to subsidize them in return for relaxation of structure or surface parking requirements. Thus, it has provided incentives for partnerships with the private sector in the promotion of biking, walking, and use of public transit.

Mandatory Project Reviews.

Local planning and transportation agencies, as well as local governing boards, have opportunities to comment on federally funded projects through the environmental impact statement (EIS) process. This process was used effectively by Arlington in its review of plans for I-66. While comments in this process, or others like them, are not binding on state or federal agencies, if these tools are used prudently they can give local agencies and the public substantial influence on the design of a project so that it helps achieve master plan objectives, or at the least, does not impair their achievement. They provide, at best, a means of forcing consideration of

bike facilities, which might otherwise not be included. And to a considerable extent, the effectiveness of these tools is enhanced if there is both a vigilant advocacy group that is engaged in the process, and a bureaucrat in local government whose job it is to both press the case for bike facilities at every opportunity, and to work closely with external advocates of biking so that their participation is well informed, timely, and on point.

Urbanity Matters

One apparent reason why Arlington was more successful than other local suburban jurisdictions in building a biking system was its urbanity, both with respect to density, and in its proximity to the urban core of the region. For Arlington, bicycle commuting to work in its own employment centers and those in the District of Columbia was a short ride. Moreover, most of its new development activity involved high-density projects, for which bike facilities were a minor, almost insignificant marginal cost to the developers, who were providing a substantial bundle of amenities to attract business and residents to occupy their projects. Biking opportunities both improved their marketability and offered economic incentives in the form of reduced parking requirements. Because the residential street system was in place and mature, routes were the only practicable means of producing a full system, and they presented fewer threats to neighborhood tranquility than widening roads to provide bike lanes.

Conclusion

While increased biking among the populace is hardly a panacea, interestingly biking does sit at the nexus of some of our most critical problems. Thus policies directed towards increasing biking offer a partial solution to those problems. Most directly for our purposes biking as a

physical activity offers important health benefits, such as reduced obesity. As a form of transportation, especially utilitarian transportation like commuting, biking relieves traffic congestion, decreases air pollution, and reduces energy consumption.

However, biking does present its own physical dangers and difficulties. For many communities, especially urban and some suburban communities, these dangers and difficulties can be greatly reduced by creation of a well-connected and integrated biking system. Since community resources are far from infinite, building a quality biking system requires taking scarce resources from other areas, be it other governmental programs or lower taxes. Thus building a biking system usually leads to some amount of difficult political conflict.

Arlington, Virginia offers one of the better overall biking systems in United States, especially in the eastern half of the nation. In our study we examined the reasons behind Arlington's success. In part the Arlington system came about due to several natural advantages the county enjoyed including its urbanity and transportation independence from the state of Virginia. Beyond the natural advantages, however, are factors that lend themselves to replicating elsewhere. The genesis for Arlington's biking system did not come from grassroots demand or pressure. Rather it came from county leaders, especially professionals in the county government, who saw biking as part of a solution to a general transportation problem and then worked to institutionalize biking. This does not mean that the key policy entrepreneur or entrepreneurs must come from government but it does suggest that grassroots pressure will likely fail unless some key players in the government believe in the importance of biking for the overall transportation system. Thus one potentially effective political strategy is for activists to pressure elected officials to select professional managers who see bikeways as crucial to the overall transportation

system. Then it is important to formalize the government-citizen relationship through an advisory panel.

Another potentially replicable lesson from Arlington is the strategy of building a piece at a time, sometimes even at lower standards than desirable, to get components of a system into place and then upgrading it later. Supporters of biking may dislike this approach since it seems like a bad compromise to accept minor improvements now for the promise of more later. (Likewise, various legal construction and liability standards can be a constraint.) Yet building a fully elaborated biking system is not normally politically practical. In Arlington the incremental creation of biking assets helped create demand for more and better facilities. In turn this created political support for expanding and upgrading.

Finally, Arlington took advantage of windows of opportunity in sometimes negative circumstances. The construction of I-66 was in many ways very bad for Arlington – for example, it split neighborhoods and divided the county in half north from south. Yet, it also led to the creation of the Custis trail in part because county leaders took advantage of a window of opportunity. Similarly, the county saw the coming of Metro as a window of opportunity to integrate different modes of travel. Many communities frequently face similar major disruptions due to the creation or expansion of highways, for example. In some cases such disruptions may provide an opportunity for augmenting biking.

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