The Regional Response to Federal Funding for Bicycle and Pedestrian Projects

Susan Handy
Barbara McCann
Linda Bailey
Michelle Ernst
Lanier McRee
Emily Meharg
Reid Ewing
Kate Wright

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Institute of Transportation Studies, UC Davis

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Institute of Transportation Studies, University of California, Davis

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Introduction

Since its initiation in the early 20th century, the federal surface transportation program has focused on highway construction and continues to do so to this day. However, over the past three decades, views of non-motorized modes and of federal interest in promoting them have changed dramatically. As is now widely recognized, a shift from motorized to non-motorized modes could produce abundant environmental benefits, including less air pollution, less water pollution, less noise, and lower greenhouse gas emissions. Economic benefits could come from reduced household spending on transportation, given the low cost of non-motorized modes. Non-motorized modes could also improve equity of access to jobs, healthcare, services, and other activities, especially for low-income households, the young, the elderly, and the disabled, who have more limited access to cars. Pedestrian infrastructure is also an essential component of an effective public transportation network. The public health community has raised awareness that “active travel” helps individuals meet recommended levels of physical activity, with significant benefits for health, as well as reductions in health care costs. Pedestrian and bicycle infrastructure is increasingly recognized as a critical component of a safe and efficient transportation system.

Such benefits have provided justification for a national interest in funding for bicycle and pedestrian (bike/ped) infrastructure, such as sidewalks, safe pedestrian crossings, bike lanes, shared-use trails and bridges, and bicycle parking facilities. Provisions of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

led to a dramatic increase in federal funding available for pedestrian and bicycle facilities. The Transportation Equity Act for the 21st Century (TEA-21), passed in 1998, continued this trend, with the result that spending went from less than $7 million per year before ISTEA to over $400 million annually by 2003; over the six-year life of TEA-21, more than $1.4 billion was spent on bicycle and pedestrian projects, more than twice what was spent in the six previous years under ISTEA (Ernst, 2004). The latest federal transportation bill, known as SAFETEA-LU, signed into law in August 2005 and set to expire in 2009, offered the potential for an even more dramatic increase in federal transportation spending on bicycling and walking to more than $4 billion over the life of the bill.

However, while Congress made it possible to spend federal funding on bicycle and pedestrian infrastructure, it did not mandate spending on these transportation modes. Instead, the decision to spend this money is made by metropolitan planning organizations (MPOs) in metropolitan areas of over fifty thousand and by state departments of transportation (DOTs) inside and outside of metropolitan areas. This raises several questions.

- To what degree have MPOs and local governments taken advantage of the opportunity to invest in bike/ped infrastructure?
- What factors explain the variation in bike/ped investments across MPOs?
- Has federal support for bike/ped infrastructure led to increased attention to these modes throughout the transportation planning process?
- Have bike/ped investments stimulated by federal funding had a positive impact on walking and bicycling?

With the next federal transportation authorization bill now under consideration, as well as tens of billions of dollars in transportation funding as a part of an economic stimulus program, understanding the efficacy of federal funding for non-motorized modes is of critical importance. This paper explores these questions through an analysis of patterns of spending of federal funds across metropolitan regions, in-depth case studies of policies and projects in two metropolitan regions, Sacramento, California and Baltimore, Maryland, and an analysis of the impact of these investments on bicycling and walking behavior.

Chapter 1: Sources and Patterns of Spending

Overview

Pedestrian and bicycle improvements have been eligible for federal transportation funding since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 through the Federal Highway Administration (FHWA). While the federal program made spending on bicycle and pedestrian projects eligible beginning in that year, and set up some programs to encourage it, Congress did not mandate spending on these transportation modes. Instead, the decision to spend this money was made by metropolitan planning organizations (MPOs), which prioritize federal requests from counties and cities in metropolitan areas of over 50,000, and by state departments of transportation (DOTs). Not surprisingly, states and metropolitan areas vary widely in how much they use federal funds for pedestrian and bicycle projects. This analysis of spending patterns over time, and by state and metropolitan region, seeks to place the two case studies that follow, for Baltimore, Maryland, and Sacramento, California, within the context of their peer metropolitan areas, within their respective states, and within the larger context of federal transportation policy.

Spending Patterns Over Time

Transportation spending is authorized by multi-year bills. ISTEA, which restructured the federal highway program to allow more flexibility in spending, was passed in 1991 and covered the period from 1992 through 1997. It was followed by TEA-21 (1998-2004) and by the current bill, SAFETEA-LU (2005-2009). Since 1992, when ISTEA went into effect, a total of more than $3.6 billion in federal transportation

funding has been obligated by state DOTs and MPOs to spend on bicycle and pedestrian projects. We used the Federal Highway Administration's (FHWA) Fiscal Management Information System (FMIS) to analyze spending patterns by states and regions[1]. As shown in Figure 1, the amount obligated, or firmly programmed and spent each year, increased dramatically from 1991 through 2003, and has declined slightly since then. Spending peaked in 2003 at over $400 million per year, dropping to $373 million by 2006.

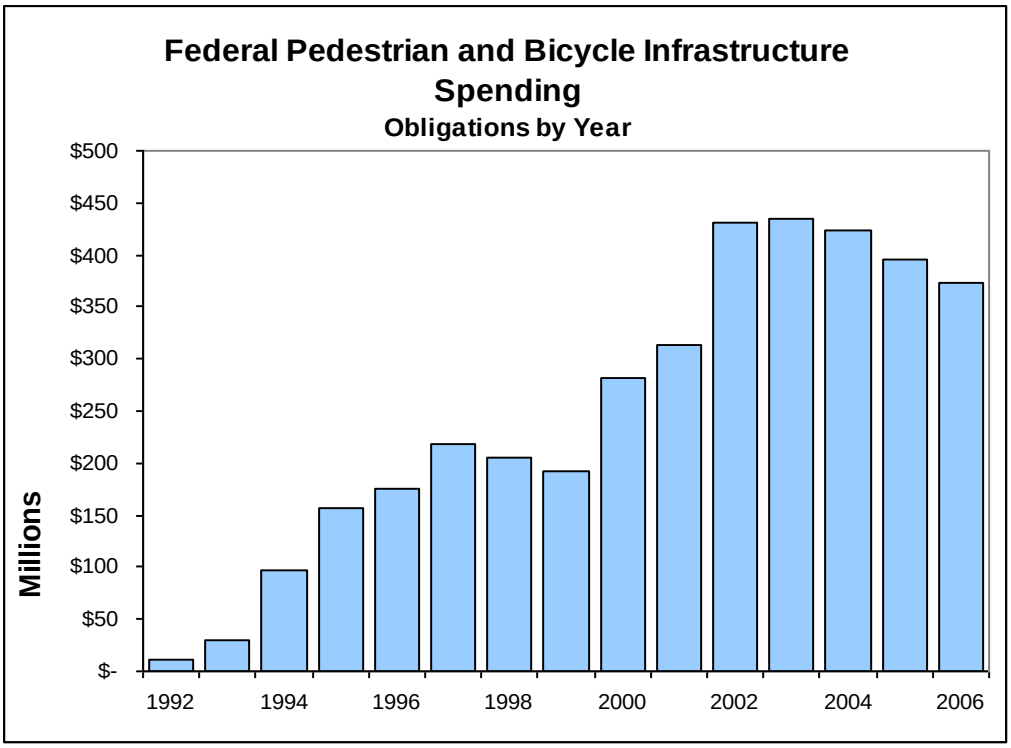

Figure 1. Federal bike/ped funding obligations by year, 1992-2006

Program Breakdown

Federal transportation funding does not come out of a single large pot, but from a variety of programs. Understanding these programs is important to understanding

[1] See appendix A for more information on this rich and complex data source.

how states and local governments decide to spend on bicycle and pedestrian projects.

Most federally-funded bicycle and pedestrian projects are supported by three programs: Transportation Enhancements, the Congestion Mitigation and Air Quality program (CMAQ), and the portion of the Surface Transportation program (STP) reserved for urban areas over 200,000. Two of these programs have specific purposes: the Transportation Enhancements program is aimed at "enhancing" the transportation system, and funds twelve project types, three of which are explicitly for bicycle and pedestrian infrastructure such as multi-use paths. The CMAQ program is designed to provide funding to regions facing air quality challenges, to help them reduce emissions through a variety of activities, including providing more travel by "zero-emission" modes. Depending upon the state, these two programs are administered either directly by the state, or by the metropolitan planning organizations. The third program, Surface Transportation program Urbanized, is a sub-category of the STP program that is specifically sub-allocated to metropolitan planning organizations. All STP dollars are available for a wide variety of transportation projects.

Transportation Enhancements has been the largest source of funds for non-motorized improvements, with CMAQ second, and STP Urbanized third. See Figure 2.

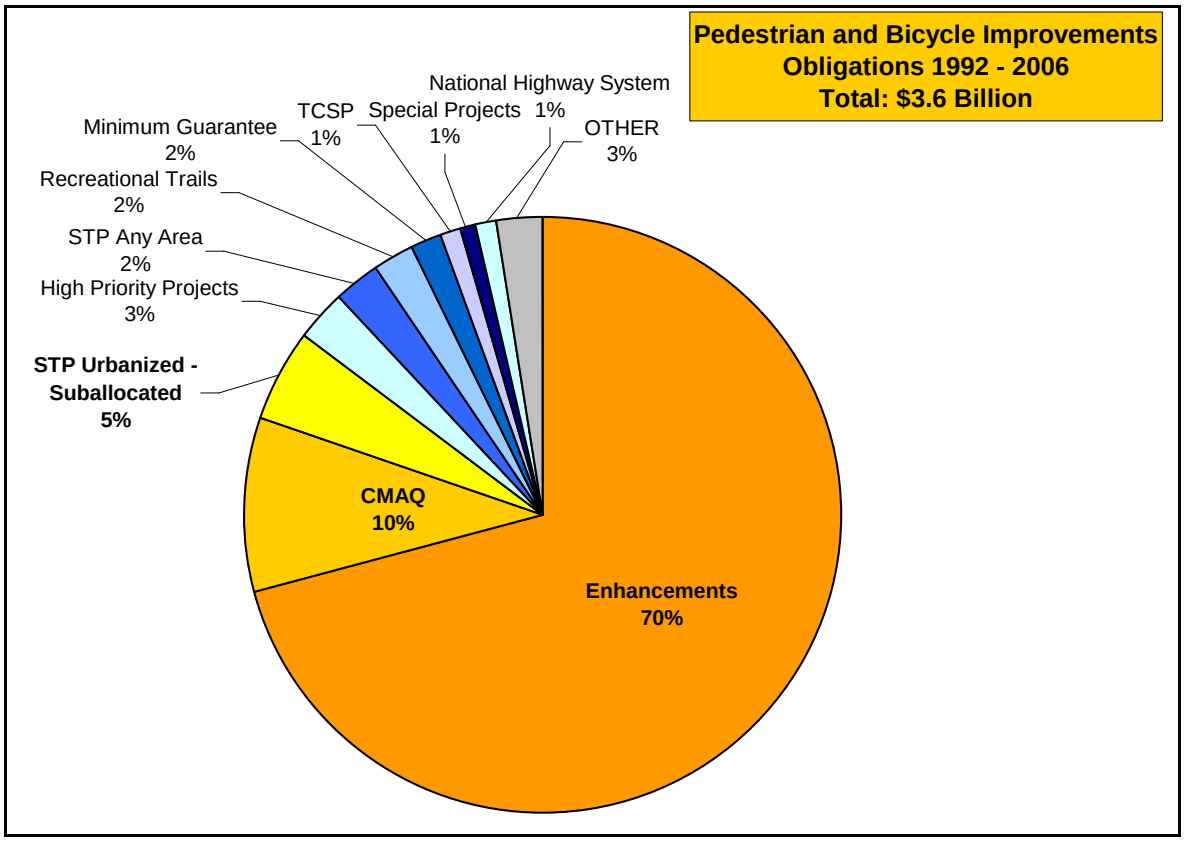

Figure 2. Program breakdown of total federal bike/ped spending, 1992-2006

Together, these three programs made up 85% of the federal spending on pedestrian and bicycle improvements since ISTEA was adopted, with Transportation Enhancements in the lead. Other programs funding bicycle and pedestrian improvements include the dedicated Recreational Trails program, High-Priority Projects (congressional earmarks for specific projects), the Transportation Community and System Preservation program (TCSP), and use of small amounts from programs more typically used for highway projects, including other sub-programs of STP,[2] the National Highway System, and Minimum Guarantee.

[2] Two subcategories of funding within STP have a special focus; STP Safety became the Highway Safety Improvement program in 2005, when it was moved out of the official STP group of funds.

To better understand the federal spending program, it is helpful to look at spending figures for a single year. In 2006, the total FHWA program for all projects funded through highway related programs was $35 billion. Of these funds, $30.7 billion were given to the states through a number of distinct spending programs, with wide latitude to select individual projects for funding; most such projects require a 20% local match. The state DOT and the MPOs within the state are responsible for programming these federal funds. Congress earmarked, or set aside, an additional $2.96 billion in 2006 for use on specified projects. Within the $30.7 billion apportioned to the states, a total of about $373 million went to non-motorized transportation projects.

Clearly, the fraction of total federal transportation spending that goes to bicycle and pedestrian infrastructure is small. It remains a small portion even within the programs most often associated with such projects. Table 1 shows that in 2006, bicycle and pedestrian spending was less than half of the Transportation Enhancements program, and was well less than one percent of the other two programs most commonly used for bike/ped projects. Spending on non-motorized projects is a small slice of the overall federal pie, and is strongly concentrated in the single program of Transportation Enhancements.

Transportation Enhancements is also technically a subprogram under STP, but is typically treated very differently than the other subprograms, so it is broken out here.

Bike/ped Eligible Program	Description	2006 Total Obligation	$ Obligated to Bike/ped Projects	% of Programmatic Total used for Bike/ped Projects
Transportation Enhancements	Specifically set aside for non-traditional projects.	$519 million	$232 million	45%
Surface Transportation program (STP)	Wide eligibility.	$6.8 billion	$20 million	.003%
Congestion Mitigation and Air Quality Improvement program (CMAQ)	Available only in places designated air quality non-attainment and maintenance areas.	$842 million	$26.8 million	.03%

Table 1. Major programs used to fund bike/ped projects, 2006

Spending Changes Over Time

Most of the growth in bike/ped spending has been a result of increases in the Transportation Enhancement program, particularly from 1992 through 2002. Over time, a greater variety of federal programs have been used to fund bicycle and pedestrian projects, as shown in Figure 3.

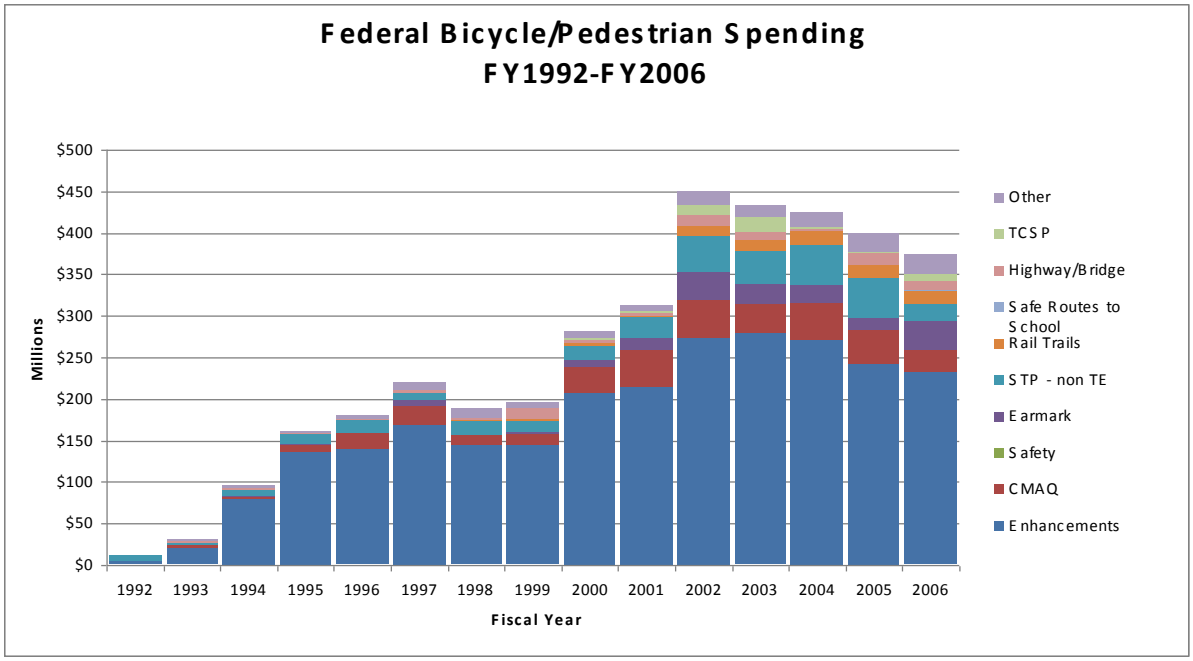

Figure 3. Federal bike/ped spending by program category, 1992-2006

The increase in the variety of programs used for non-motorized projects was most marked between 1999 and 2002, as states and regions paid for bicycle and pedestrian projects with funds from the CMAQ, STP, Rail Trails, and the new TCSP program, and as Congress increased bike/ped earmarks. In 1999, Transportation Enhancements funds made up 75% of all bike/ped spending; in just two years, this reliance dropped to 60. Once this diversification was achieved, it remained relatively stable; in 2006 Transportation Enhancements was responsible for 63% of bike/ped spending. It is notable that very little of the Highway Safety funds (the green bar in Figure 3) have been devoted to bike/ped safety projects. The new Safe Routes to School program, enacted as part of SAFETEA-LU in 2005, has a very modest allocation and barely registers in the final two years included in our study. And while earmarking funding for specific projects is often denounced as poor policy, it has become a significant source of funding for bicycle and pedestrian projects, totaling

more than $34 million in obligations in 2006. Despite the diversification of spending sources, the total federal dollars spent on bike/ped projects declined between 2002 and 2006, mostly due to a decline in Transportation Enhancements spending.

Federal Transportation Spending within Metropolitan Areas

While looking at national trends is useful, it is important to remember that most of the final spending decisions are not made at the federal level. Spending of federal transportation funds is the result of decisions made at almost all levels of government. Congress designates earmarks and sets program guidelines. State departments of transportation make direct programming decisions for much of the federal money, often including the prominent Transportation Enhancements program. Metropolitan planning organizations help direct funding of a smaller portion of the funds, but are reliant on the decisions made by the cities and counties that are their members, and the projects that they submit. As a result, spending of federal transportation dollars within metropolitan areas on non-motorized projects varies widely. In metropolitan areas with a population over 1 million, federal financial records show that spending ranges from a low of $0.18 per capita per year to a high of $2.30 on bicycle and pedestrian projects. Among the 50 largest metropolitan areas, the five top-spending regions[3] on average invested almost seven times as much per capita as the five lowest-spending metro areas. High-spending regions invested an average of $1.54 per resident per year, while low-spending regions spent an average of 21 cents or less per capita per year.

[3] Providence RI was removed as an outlier.

Recent research shows that socio-demographic factors likely play a role in this spending variation. In a study that looked at bike/ped projects at the county level, counties with persistently high poverty levels and low educational attainment were less likely to use federal funding to implement bike/ped projects. (Cradock et al, 2009). Our case studies, discussed below, focus on the policy environment that may have affected spending levels, and begin to draw out some of the reasons for this variability. In Table 2, ranked by per-capita spending, Sacramento ranks 15th while Baltimore ranks 27th out of the 50 largest metropolitan areas in the US.

Rank	Metropolitan Area Name	Population (2005)	Bike/ped Obligations (millions)	Annual Bike/ped per capita
1	Providence-New Bedford-Fall River, RI-MA	1,622,520	$55.9	$2.30
2	Nashville-Davidson--Murfreesboro, TN	1,422,544	$40.9	$1.92
3	Seattle-Tacoma-Bellevue, WA	3,203,314	$78.2	$1.63
4	Atlanta-Sandy Springs-Marietta, GA	4,917,717	$104.0	$1.41
5	Tampa-St. Petersburg-Clearwater, FL	2,647,658	$54.5	$1.37
6	St. Louis, MO-IL	2,778,518	$57.0	$1.37
7	Minneapolis-St. Paul-Bloomington, MN-WI	3,142,779	$61.4	$1.30
8	Hartford-West Hartford-East Hartford, CT	1,188,241	$22.1	$1.24
9	Portland-Vancouver-Beaverton, OR-WA	2,095,861	$38.7	$1.23
10	Oklahoma City, OK	1,156,812	$19.3	$1.11
11	Rochester, NY	1,039,028	$16.6	$1.07
12	Orlando-Kissimmee, FL	1,933,255	$30.4	$1.05
13	Cleveland-Elyria-Mentor, OH	2,126,318	$33.3	$1.05
14	Jacksonville, FL	1,248,371	$19.2	$1.03
15	Sacramento--Arden-Arcade--Roseville, CA	2,042,283	$29.0	$0.95
16	New Orleans-Metairie-Kenner, LA	1,319,367	$17.8	$0.90
17	San Francisco-Oakland-Fremont, CA	4,152,688	$54.5	$0.88
18	Kansas City, MO-KS	1,947,694	$25.1	$0.86
19	Birmingham-Hoover, AL	1,090,126	$13.8	$0.85
20	Milwaukee-Waukesha-West Allis, WI	1,512,855	$18.7	$0.82

Rank	Metropolitan Area Name	Population (2005)	Bike/ped Obligations (millions)	Annual Bike/ped per capita
21	San Jose-Sunnyvale-Santa Clara, CA	1,754,988	$21.1	$0.80
22	Louisville-Jefferson County, KY-IN	1,208,452	$14.2	$0.78
23	Salt Lake City, UT	1,034,484	$11.8	$0.76
24	San Antonio, TX	1,889,797	$19.6	$0.69
25	Buffalo-Niagara Falls, NY	1,147,711	$11.2	$0.65
26	Phoenix-Mesa-Scottsdale, AZ	3,865,077	$35.1	$0.61
27	Baltimore-Towson, MD	2,655,675	$23.5	$0.59
28	Cincinnati-Middletown, OH-KY-IN	2,070,441	$17.9	$0.58
29	Detroit-Warren-Livonia, MI	4,488,335	$38.4	$0.57
30	Indianapolis-Carmel, IN	1,640,591	$13.7	$0.56
31	Denver-Aurora, CO	2,359,994	$18.8	$0.53
32	Memphis, TN-MS-AR	1,260,905	$10.0	$0.53
33	Washington-Arlington-Alexandria, DC-VA-MD-WV	5,214,666	$39.8	$0.51
34	Chicago-Naperville-Joliet, IL-IN-WI	9,443,356	$69.2	$0.49
35	Boston-Cambridge-Quincy, MA-NH	4,411,835	$31.7	$0.48
36	Richmond, VA	1,175,654	$8.4	$0.48
37	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	5,823,233	$41.3	$0.47
38	New York-Northern New Jersey-Long Island, NY-NJ-PA	18,747,320	$116.2	$0.41
39	Pittsburgh, PA	2,386,074	$13.8	$0.39
40	Columbus, OH	1,708,625	$9.6	$0.38
41	Austin-Round Rock, TX	1,452,529	$7.5	$0.34
42	Riverside-San Bernardino-Ontario, CA	3,909,954	$19.8	$0.34
43	Houston-Sugar Land-Baytown, TX	5,280,077	$25.1	$0.32
44	Miami-Fort Lauderdale-Miami Beach, FL	5,422,200	$25.0	$0.31
45	San Diego-Carlsbad-San Marcos, CA	2,933,462	$12.7	$0.29
46	Dallas-Fort Worth-Arlington, TX	5,819,475	$22.1	$0.25
47	Las Vegas-Paradise, NV	1,710,551	$6.1	$0.24
48	Los Angeles-Long Beach-Santa Ana, CA	12,923,547	$38.2	$0.20
49	Charlotte-Gastonia-Concord, NC-SC	1,521,278	$4.3	$0.19
50	Virginia Beach-Norfolk-Newport News, VA-NC	1,647,346	$4.5	$0.18

Table 2. Spending on pedestrian and bicycle improvements by metropolitan area, 1992 – 2006

Another indicator of the different paths taken by metropolitan areas is which federal programs they have chosen to use to fund bike/ped infrastructure. Programmatic spending differences can begin to tell a story about the strategies that regions are employing to tap federal funds for bicycle and pedestrian uses. Table 3 shows spending patterns by metropolitan area according to the three major federal programs that are the source of most of the funds for non-motorized projects. It is sorted according to the percentage of funds that came out of the Transportation Enhancements program, since this program makes up the bulk of such spending. It shows that most regions did rely heavily on the Transportation Enhancements program, but that reliance ranged from nearly 100% down to around 40%, with a few metro areas using it even less. Use of the two other major programs, CMAQ and STP, was highly variable, ranging from no use of these programs at all to 45%. The chart also indicates the total number of federal programs used by the metro area to fund bike/ped infrastructure.

Metropolitan Area Name	Bike/ped per capita per year	% TE of total	% CMAQ of total	% STP-Urban (2) of Total	Count, Non-TE Programs Used for Bike/ped Projects
Memphis, TN-MS-AR	$0.53	99%	0%	0%	1
Cincinnati-Middletown, OH-KY-IN	$0.57	96%	1%	0%	4
Columbus, OH	$0.37	95%	0%	0%	4
Salt Lake City, UT	$0.75	94%	6%	0%	4
Indianapolis-Carmel, IN	$0.56	94%	0%	2%	2
Las Vegas-Paradise, NV	$0.24	92%	0%	2%	3
Riverside-San Bernardino-Ontario, CA	$0.34	90%	7%	0%	4
Los Angeles-Long Beach-Santa Ana, CA	$0.20	90%	0%	1%	8

Metropolitan Area Name	Bike/ped per capita per year	% TE of total	% CMAQ of total	% STP-Urban (2) of Total	Count, Non-TE Programs Used for Bike/ped Projects
Cleveland-Elyria-Mentor, OH	$1.05	88%	0%	0%	6
Pittsburgh, PA	$0.39	84%	0%	0%	3
Oklahoma City, OK	$1.11	82%	0%	0%	2
Kansas City, MO-KS	$0.86	82%	13%	0%	5
Baltimore-Towson, MD	$0.59	81%	0%	0%	4
New Orleans-Metairie-Kenner, LA	$0.91	79%	0%	17%	2
Denver-Aurora, CO	$0.53	78%	5%	0%	6
Virginia Beach-Norfolk-Newport News, VA-NC	$0.18	78%	12%	10%	3
San Antonio, TX	$0.69	77%	0%	3%	6
Minneapolis-St. Paul-Bloomington, MN-WI	$1.30	75%	0%	8%	10
Hartford-West Hartford-East Hartford, CT	$1.25	75%	0%	4%	5
Jacksonville, FL	$1.03	75%	0%	0%	4
Miami-Fort Lauderdale-Miami Beach, FL	$0.31	74%	1%	13%	6
Dallas-Fort Worth-Arlington, TX	$0.25	73%	13%	2%	4
Austin-Round Rock, TX	$0.34	70%	0%	21%	4
Rochester, NY	$1.07	66%	0%	0%	4
St. Louis, MO-IL	$1.39	65%	4%	23%	10
Nashville-Davidson--Murfreesboro, TN	$1.88	64%	1%	8%	7
Birmingham-Hoover, AL	$0.85	63%	29%	0%	4
San Jose-Sunnyvale-Santa Clara, CA	$0.80	62%	25%	9%	4
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	$0.48	62%	7%	6%	11
Orlando-Kissimmee, FL	$1.05	60%	0%	13%	6
Houston-Sugar Land-Baytown, TX	$0.31	60%	20%	0%	6
San Francisco-Oakland-Fremont, CA	$0.88	59%	17%	16%	8
Chicago-Naperville-Joliet, IL-IN-WI	$0.50	59%	23%	12%	9
Average (top 50)	**$0.64**	**58.5%**	**14%**	**9%**	**6.24**
Washington-Arlington-Alexandria, DC-VA-	$0.51	54%	26%	3%	10

Metropolitan Area Name	Bike/ped per capita per year	% TE of total	% CMAQ of total	% STP-Urban (2) of Total	Count, Non-TE Programs Used for Bike/ped Projects
MD-WV					
Detroit-Warren-Livonia, MI	$0.57	51%	0%	0%	8
Charlotte-Gastonia-Concord, NC-SC	$0.19	51%	1%	22%	14
Atlanta-Sandy Springs-Marietta, GA	$1.40	49%	18%	31%	7
Louisville-Jefferson County, KY-IN	$0.78	48%	14%	25%	6
Tampa-St. Petersburg-Clearwater, FL	$1.37	47%	13%	0%	6
San Diego-Carlsbad-San Marcos, CA	$0.29	47%	53%	0%	2
New York-Northern New Jersey-Long Island, NY-NJ-PA	$0.41	44%	19%	7%	13
Buffalo-Niagara Falls, NY	$0.65	43%	24%	13%	9
Phoenix-Mesa-Scottsdale, AZ	$0.60	41%	35%	23%	4
Sacramento--Arden-Arcade--Roseville, CA	$0.95	40%	45%	5%	10
Portland-Vancouver-Beaverton, OR-WA	$1.23	37%	35%	11%	11
Milwaukee-Waukesha-West Allis, WI	$0.81	33%	44%	0%	5
Boston-Cambridge-Quincy, MA-NH	$0.47	32%	42%	1%	5
Seattle-Tacoma-Bellevue, WA	$1.63	28%	29%	21%	17
Providence-New Bedford-Fall River, RI-MA	$2.32	27%	8%	4%	12
Richmond, VA	$0.48	19%	2%	0%	4

Table 3. Spending on pedestrian and bicycle improvements by federal program, 1992 – 2006

For our case study cities, the differences in spending by program as recorded in the FMIS database is quite marked, with Sacramento showing far greater programmatic spending diversity than Baltimore. Just 40% of Sacramento's non-motorized spending came from Transportation Enhancements, below the nationwide figure of 58.5%, and ten other programs were used to fund bicycle and pedestrian

projects. In contrast, Baltimore relied on Transportation Enhancements funds for more than 80% of its non-motorized spending, and used funding from just four other programs on non-motorized projects.

While Sacramento, with its broader use of federal funding sources, spent more per capita on bike/ped projects than Baltimore, we did not find that greater diversity of funding sources was consistently linked to higher per-capita spending. We did find that larger regions are much more likely to have employed a variety of spending programs; this difference is likely because of their higher staffing levels and greater capacity to find and use less obvious spending sources.

Factors Influencing Spending Patterns

What factors may influence these spending patterns within metropolitan areas? Local and state policies and procedures may make spending of these sources on bike/ped projects more or less difficult. While the federal programs set general funding criteria, in many cases the states or the MPOs set more specific criteria and procedures for administering these funds. One example of this is the variable local match requirement for the Transportation Enhancements program, which is set by each state. In addition, state and local planning processes and documents may give bicycle and pedestrian accommodation a high priority – or may not. The availability of state or local funding may also make a difference: if such funding is abundant and easier to use than the federal money, it may be preferred. In other places, the federal programs may be seen as the only significant source of money for infrastructure such as multi-use paths. Political leadership and popular support can

also influence investment patterns, though these factors are very difficult to measure.

These highly local factors are impossible to assess through a national scan. The case studies in the following chapter will look in some depth at the many localized factors that have influenced spending patterns in Sacramento, and Baltimore.

Sub-allocation

We have examined one potential influence that is easier to measure at the national level: how much control state policies give regions in spending some of the federal funds. States are particularly influential in setting federal spending patterns because for most funding programs, they receive the majority of the money from the federal government and decide how it is spent., A small portion of the Surface Transportation program is automatically sub-allocated, but the states choose how to manage the other two major programs that fund bicycling and walking infrastructure, Transportation Enhancements and CMAQ. State DOTs can decide to administer these programs themselves, or they can sub-allocate the funds to the metropolitan regions. (Federal guidance recommends sub-allocation for these programs, but many states do not do so.) Since neither of these programs is wholly dedicated to bicycle/pedestrian projects, the question of who is deciding how to spend these funds is of critical importance.

Our national analysis found that the ten states that sub-allocate both Transportation Enhancements (TE) and CMAQ funds on average have spent slightly more per capita ($12.18, 1992-2006) on non-motorized projects than the 22 states

that sub-allocate neither program ($11.73). The states that sub-allocate Transportation Enhancements appear to concentrate *more* of their spending into the TE program. The states that do not sub-allocate have used TE funding for about 62% of their bike/ped projects, while the states that do have used TE for about 67% of their bike/ped projects.

Among the 50 largest metropolitan areas in the nation, those in states with sub-allocation of the Transportation Enhancements program spent a slightly higher portion of their overall federal highway dollars on bicycle and pedestrian infrastructure – about 1.3% as opposed to 0.9% in the cities located in states without sub-allocation policies.

California sub-allocates both programs, and in fact sub-allocates other federal transportation funds, including STP, to a greater degree than any other state (Kinsey, 2003). Maryland administers both programs at the state level. In the next chapter we'll discuss what that means for our case study regions.

Chapter 2: Case Studies of Baltimore and Sacramento

How Case Studies Fit Into the Federal Picture

The variation in spending demonstrated in the preceding analysis shows that making it possible for state and local jurisdictions to invest in non-motorized infrastructure does not mean such investments automatically occur. What state and regional policies and conditions have resulted in greater use of federal funds for bicycling and walking infrastructure? And what impact has federal funding had on bike/ped planning at the regional level?

To begin to answer these questions, we conducted detailed case studies of Sacramento, California, and Baltimore, Maryland. We cannot be certain that the experiences of these two regions are typical of other regions. Differences in community income levels, ethnic composition, and localized cultural attitudes toward bicycling and walking may have subtle influences that are difficult to capture in this type of case study. However, the case studies enable an in-depth exploration of a wide range of potentially important factors, and the results may provide a framework for a more quantitative analysis in a larger sample of regions.

We selected these regions based in large part on prior evidence of bike/ped spending in these regions, with Sacramento documented as a relatively high spender with an extensive bicycle network and Baltimore a relatively low spender with a limited network (Ernst, 2004; Thunderhead Alliance, 2007; Dill & Carr, 2003). Practical considerations also factored into the selection, including the availability of travel diary surveys from two points in time (for an analysis of changes in bicycle and

pedestrian travel presented in chapter 4) and the proximity of researchers to these regions.

The regional case studies drew on a variety of sources to identify policies and programs, documenting the role of state policies and local initiatives, and assessing the degree to which bike/ped concerns are institutionalized in the regional planning process. The studies rely on two primary categories of sources: available documents, such as plans, funding programs, and adopted policies; and interviews with key informants, including MPO staff, state DOT officials, local government officials, bike/ped coordinators, and bicycle and pedestrian advocacy groups.

Our studies focused on the metropolitan planning organization for each region. In Sacramento, this is the Sacramento Area Council of Governments (SACOG), covering six counties, including El Dorado, Placer, Sacramento, Sutter, Yolo and Yuba, and 22 cities, including the state capital and largest city in the region, Sacramento. In 2007, the population was almost 2.3 million, with over half of the residents living in Sacramento County. The Baltimore Regional Transportation Board (BRTB), the federally mandated MPO for the Baltimore region, is housed within and supported by the Baltimore Metropolitan Council (BMC), a regional organization comprised of six jurisdictions, including Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties and the city of Baltimore. In 2007, the population of the Baltimore region was 2.6 million. Although Baltimore is the largest city, the region is also home to the state capital, Annapolis, in Anne Arundel County.

In this chapter, we summarize findings from the case studies, comparing the two cases on several points. The detailed case studies on which this summary is

based are provided as separate appendices. In chapter 3, we discuss the key themes that emerge from the comparison of the two cases.

Existing Conditions

In a national comparison of 42 cities made in 2000, the city of Sacramento had the highest density of bicycle lanes and multi-use paths (Dill & Carr, 2003); Baltimore was not part of the survey. According to a survey created by the advocacy group the Thunderhead Alliance, as of 2007, Sacramento had 2.8 miles of bicycle facilities per square mile, or 3.1 miles per square mile including planned facilities, versus 1.2 and 2.5 miles on average for major cities (2007, pp. 64 and 65). Baltimore ranks low in the same survey, 40th out of 50, for existing miles of bicycle facilities. It has 0.3 miles of facility per square mile of area; however, the city has plans to increase its bike facilities to 5.2 miles per square mile. Unfortunately there is no similar national comparison of the existence of pedestrian facilities.

As a whole, the SACOG region has a higher average percentage of people bicycling to work than the U.S. In contrast, the SACOG region has a lower percentage of people walking to work than the U.S. average, at just over 2%. The mode share for bicycling to work is lower in the Baltimore region than the United States as a whole. But the regional pedestrian mode share is on par with the national average, at just under 3%. Within the region, the cities of Baltimore and Annapolis have much higher commuting mode shares by foot and bicycle. Please see chapter 4 for further analysis of walking and bicycling behavior.

Federal spending and types of projects constructed

One reason for selecting Baltimore and Sacramento was the divergent spending pattern that we discovered in our analysis of the FMIS database. As discussed in the previous chapter, analysis of data from the Federal Management Information System (FMIS) shows that the Sacramento region was 15th in the U.S. at $0.95 in federal spending on pedestrian and bicycle projects per capita per year, while the Baltimore region was 27th, at $0.59. For comparison, the average spending per capita per year between 1992 and 2006 for major metropolitan regions with populations over 1 million was $0.78.

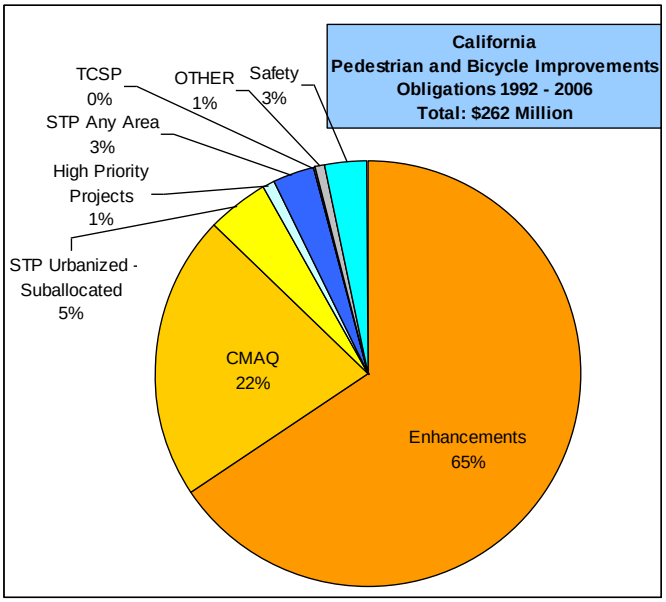

Figure 4. California Pedestrian and Bicycle Improvements, 1992-2006

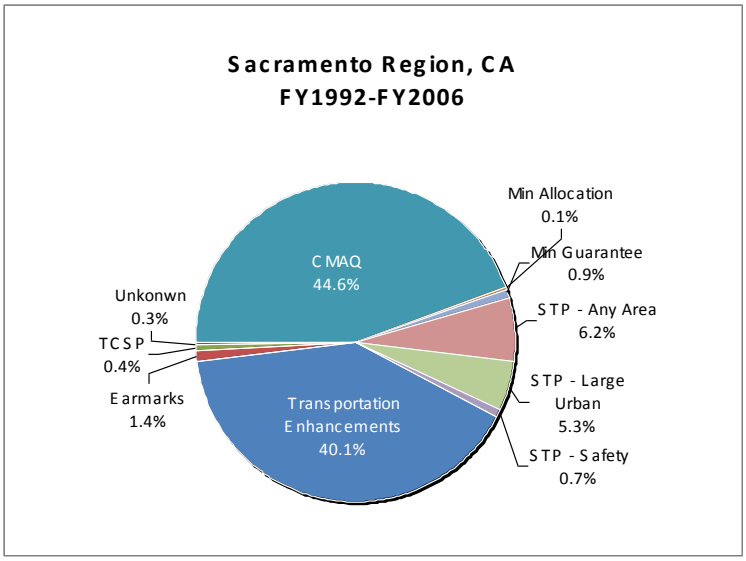

Figure 5. Sacramento Pedestrian and Bicycle Improvements, 1992-2006

The two states and regions also used the funds available from the various federal programs quite differently. Pie charts for California, Maryland, Sacramento and Baltimore detail the difference among spending patterns. The chart for California in Figure 4 shows an array of programs funding pedestrian and bicycle improvements across this large and diverse state. In California, Transportation Enhancements and CMAQ are the two main sources of pedestrian and bicycle projects. The Sacramento regional chart in Figure 5 shows an even greater emphasis on spending from the CMAQ program and from the various sub-programs of the mainstream Surface Transportation program (STP).

The Maryland pie chart in Figure 6 shows that the vast majority of funds for pedestrian and bicycle improvements in the state come out of the targeted Transportation Enhancements program, earmarks (High Priority Projects, TCSP),

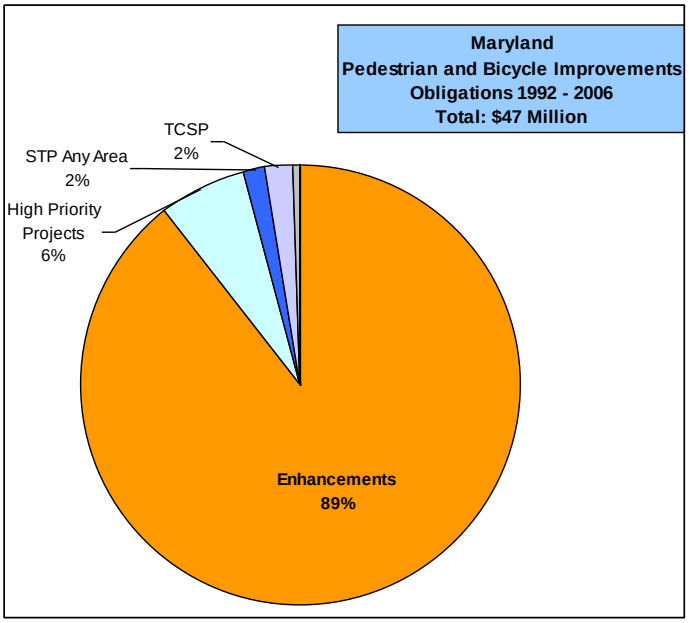

Figure 6. Maryland Pedestrian and Bicycle Improvements, 1992-2006

and STP. This does not necessarily indicate that Enhancements is the preferred source for Maryland – it could also show that other funds are not made available for pedestrian and bicycle improvements.

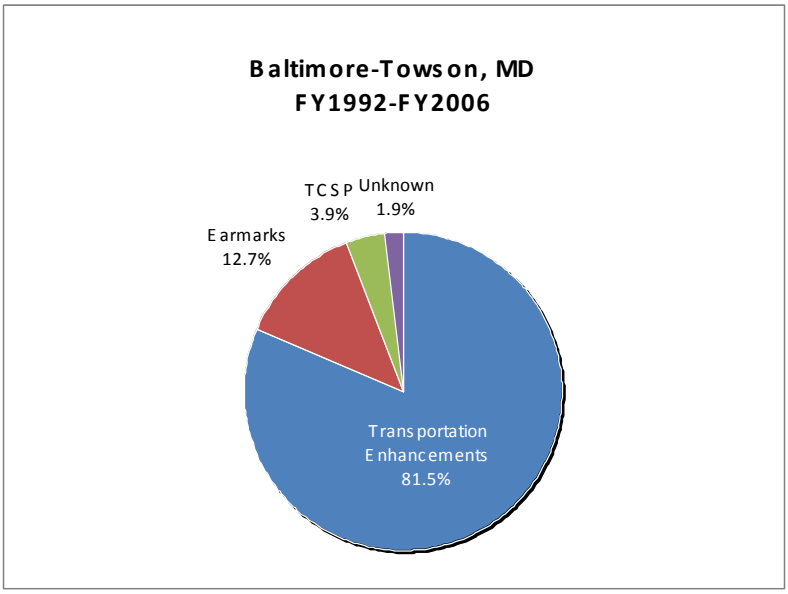

Figure 7. Baltimore Pedestrian and Bicycle Improvements, 1992-2006

Figure 7 for Baltimore reflects the statewide pattern in Maryland, with a strong emphasis on spending from the Enhancements program, and no spending from the CMAQ program.

The spending in the two regions has resulted in somewhat different outcomes on the ground in terms of the number and type of facilities built using federal funds. Information on projects that have actually been built is limited, but the differences are still marked.

The Sacramento Metropolitan region programmed $29 million of federal funding in pedestrian and bicycle projects between 1992 and 2006, spending 2.4% of its total federal transportation allocation on non-motorized transportation projects. Between 1991 and 2006, approximately 170 bike/ped projects were programmed in the regional transportation improvement program (RTIP) in the SACOG region. These projects included the construction of bike lanes, ‘road diets’ that reduced automobile lanes to provide bike lanes and improve turning movements, trail crossings of major roadways, addition of sidewalks, and traffic calming projects. See the full case study in appendix B for a listing of some of the more important projects that have been completed.

The Baltimore region programmed $23.5 million of federal funding in pedestrian and bicycle projects between 1992 and 2006, investing about 1% of its total federal transportation allocation on non-motorized projects. Between 1991 and 2006, the Baltimore region programmed funds for 103 bicycle and pedestrian projects. Prior to 2001, the largest category of infrastructure spending in Baltimore was streetscape improvements. These are expensive projects that may include

medians and intersection improvements, but also focus on lighting, landscaping and other aesthetic concerns (J. Bridges, personal communication, December 11, 2007). The second largest category of spending was off-road paths and trails. The third category is sidewalks. These are mostly retrofits, and there are many small projects. No bike lane projects were identified separately in the Baltimore TIPs between 1993 and 2001.

Figure 5, below in chapter 4, shows the breakdown of projects in Baltimore.

Influences on Spending

What helped lead to the differences just outlined between Baltimore and Sacramento, in the amount and ways they spent on bicycle and pedestrian facilities? Our case studies focused on learning about factors at the state and regional level that would influence change: policies, including the criteria used for spending federal dollars; resources such as staffing, other funding sources, and other influences. The differences between the two metropolitan areas are summarized in Table 6.

Factor	Sacramento	Baltimore
Institutionalization and Resources	○ California established a bicycle program in the 1970s. ○ Caltrans and SACOG employ bike/ped planners. ○ California provides more than $32 million in bike/ped funding annually through several programs. ○ Cities are required to have a bicycle plan to apply for state bicycle funding.	○ Bicycle and pedestrian needs were first noted in the 1993 regional plan. ○ BRTB does not employ a designated bike/ped planner. ○ Maryland provides about $6.5 million in bike/ped funding annually through several programs.
Regional Control	○ California sub-allocates 100% of CMAQ funding and 75% of other programs, including	○ Maryland does not sub-allocate federal funds beyond federal requirements;

Factor	Sacramento	Baltimore
	Transportation Enhancements and Surface Transportation programs, to the MPOs.	Transportation Enhancements funds are wholly administered by the state.
Plan-Oriented Programs	○ SACOG redistributes 13% of federal funds to outcome-oriented programs that can support bike/ped investments.	○ RTB allocates federal funds according to federal and state categories, largely defined by modes, with 1% going to bike/ped projects.
Local Government Support	○ Some cities in region pushed for bike/ped infrastructure prior to ISTEA. ○ All cities in region have a bicycle plan, and most have a bike/ped coordinator	○ Cities in the region seem to give low priority to bike/ped investments, as evidenced by limited project submissions.
Advocates	○ Planners credit coordinated support of strong bicycle and pedestrian advocacy groups.	○ Planners say advocates in region focus on state-level policy and specific projects.

Table 4. Key differences between Baltimore and Sacramento bike/ped programs

State Policy, Resources, and Funding

Conditions at the state level have a tremendous influence on federal transportation investments, because in most cases the state receives and distributes most transportation funds. State-generated resources also influence the ability to effectively spend federal funds. While both California and Maryland have positive policy approaches to bicycle and pedestrian investments, California displays a markedly different funding structure, procedural approach, and state level resources.

<u>California</u>

State policy and plans

The California Department of Transportation (Caltrans) has encouraged construction of facilities for bicycle and pedestrian use since at least the 1970s. In 2001 Caltrans adopted Deputy Directive 64 (DD64), “Accommodating Non-motorized Travel,”,

which states that “the department fully considers the needs of non-motorized travelers (including pedestrians, bicyclists and persons with disabilities) in all programming, planning, maintenance, construction, operations, and project development activities and products” (California Department of Transportation [Caltrans], 2001). The following year the State Assembly adopted Assembly Concurrent Resolution 211 to “encourage all cities and counties to implement the policies of the California Department of Transportation Deputy Directive 64 and the United States Department of Transportation's design guidance document on integrating bicycling and walking when building their transportation infrastructure” (Relative to integrating walking, etc., 2002). In 2008, DD 64 was updated and expanded to include transit vehicles and users and disabled travelers.

The state’s federally mandated state transportation plan, the *California Transportation Plan 2025* (written in 2006), and the *California Blueprint for Bicycling and Walking* (written in 2002) both express ambitious goals for bicycling and walking in the state and outline a variety of strategies for achieving these goals. However, they appear to have little effect on bicycle and pedestrian planning at the local level. Few people interviewed for this study, including SACOG staff, bicycle and pedestrian advocates, and city bike coordinators were aware of these documents or had read them.

The state requires that all cities and counties in California have a General Plan, which must include seven required elements including a circulation element. In September 2008, Governor Schwarzenegger signed a new Complete Streets law, which requires inclusion of Complete Streets policies in the general planning

process. Up until that time, the state simply suggested that cities and counties consider bicycle and pedestrian routes and facilities when addressing the mandatory issues (Governor's Office of Planning and Research, 2003).

State planning infrastructure and resources

The state bicycle program predates legislative initiatives, and was initially established in the 1970s, discontinued in the 1980s, then reestablished as the Office of Bicycle Facilities in 1990. Currently, Caltrans headquarters employs four bicycle and pedestrian staff under its Bicycle and Pedestrian program. In addition, each of the twelve Caltrans districts has its own bicycle and pedestrian coordinator, although only three are full time positions. The state founded the California Bicycle Advisory Committee (CBAC) in 1992, and established a Caltrans Pedestrian Safety Task Force in 1998 that is becoming an official advisory committee to the department.

State disbursement of federal funds

One of the most important differences between the case studies is which level of government makes the decisions about how federal transportation dollars are spent. In sub-allocating its transportation funds to metropolitan areas to a greater degree than any other state (Kinsey, 2003), California gives decision-making power to MPOs and local governments. Since approval of a state law in 1992, 100% of California CMAQ dollars have been passed through for regional distribution, and in 1997, the legislature adopted Senate Bill 45, which sub-allocated 75% of most other federal transportation funds, including the Transportation Enhancements and Surface Transportation program, for programming by MPOs and regional

transportation planning agencies (RTPAs). Details on programming of these sub-allocated funds will be discussed in the 'regional influences' section, below.

Even with sub-allocation, the state still influences the spending of federal transportation dollars in the Transportation Enhancements, CMAQ, and Safe Routes to School programs. For the Transportation Enhancements program, 25% of the funds are programmed at the state level in the interregional transportation improvement program (ITIP), which focuses on projects outside of urbanized areas. Bicycle projects in the ITIP are limited to those that get bikes off state highways and provide bike access to national and state parks and multi-modal transportation facilities (J. Haynes, personal communication, 2008; California Transportation Commission, 2003). Caltrans compiles a prioritized list of projects and the California Transportation Commission (CTC) has the final say in terms of project funding.

Although CMAQ is completely sub-allocated, a manual issued by the state is an important resource in determining project eligibility and competitiveness. Rather than using regional air quality modeling software, local governments use this manual, published by the California Air Resources Board, to help estimate cost-effectiveness of transportation projects, including bicycle and pedestrian facilities. The manual includes formulas and sample calculations for determining emissions reductions per year for a proposed project. Applicants input factors such as the average length of bicycle trips, the average daily traffic volume on the roadway parallel to the bicycle project, types of activity centers in the vicinity of the bicycle project, and days of use per year and then use the formulas to calculate annual emission reductions in kilograms per day. Default values or maximums are provided

for most of the inputs and can be used when data isn't available. (California Air Resources Board, 2005).

California was well-prepared for the Safe Routes to School (SRTS) program, a new feature in the 2005 federal transportation bill, because the state was already administering the first statewide Safe Routes to School program in the country (see below). For the separate federal program, committees in each of the 12 Caltrans districts evaluates applications according to standardized instructions and guidelines provided by the district's SRTS Coordinator. In the second cycle of this program, $46 million was available. The Caltrans Division of Local Assistance is responsible for final project approval. (Safe Routes, 2008).

State funding

The states do more than allocate federal funding programs. They create their own funding programs, often using a combination of state and federal funds. In 1972, California created the Bicycle Lane Account (BLA; renamed the Bicycle Transportation Account (BTA) in 1998), to provide "state funds for city and county projects that improve safety and convenience for bicycle commuters" (Division of Local Assistance, Caltrans, 2009, ¶ 1). From its first funding cycle in 1973 until 1997, the BLA was funded at $360,000 per year with money from the state's fuel tax. The state grants funds to cities and counties with a 10% local match. In order to receive funding, localities must have a Bicycle Transportation Plan (BTP) in place. Beginning in 1997, legislation gradually increased the BLA allocation from $360,000 up to $7.2 million by the mid-2000s. The locality must update its BTP every five years in order to remain eligible for BTA funding. An employee of the Division of Local Assistance

at Caltrans estimated that the BTA typically gets applications for five- to seven times the funding available (K. McGuire, personal communication, 2008).

Administered by Caltrans, in consultation with the California Highway Patrol, the state Safe Routes to School (SR2S) program began in 1999 and is entering its eighth funding cycle with $24 million in state funds available. SR2S requires a 10% local match. Cities, counties and school districts may apply for infrastructure projects by submitting an allocation request letter to the Division of Local Assistance.

Another state level funding resource is a county sales tax. Under state law, counties can implement a sales tax increase of up to 1% for transportation or other purposes with a two-thirds vote of its citizens. As of 2003, 13 counties had utilized sales tax for multimodal transportation capital projects with an additional three counties and one town imposing sales taxes for road projects and seven counties imposing sales taxes for transit (Goldman & Wachs, 2003). These Local Option Sales Taxes have provided substantial funding for bicycle and pedestrian projects in the region. For example, in Sacramento County, Measure A (a 0.5% sales tax for transportation first passed in 1988) generated $2.5 million in bike funding between 1993 and 1998 (Payne, 2002, Table 21, p.47). In 2004, a renewal of this sales tax required that projects include routine accommodation of bicycles and pedestrians in all projects.

Also of note is the Transportation Development Act (TDA). The TDA, passed in 1971, returns ¼ cent of the state's general sales tax to the county of origin to create a Local Transportation Fund (LTF) in each county. Article 3 of the TDA allows RTPAs to earmark 2% of the LTF for bicycle and pedestrian facilities. Between 1993

and 1998, Sacramento County spent $2.7 million in TDA money on bicycle and pedestrian facilities (Payne, 2002).

Maryland

Policy and plans

In 1995, the Maryland General Assembly created the Bicycle and Pedestrian Access 2000 program, requiring planning and studies of bicycle and pedestrian access, and, importantly, the construction of sidewalks along urban highways. In 2000, the Maryland General Assembly passed a Complete Streets law, creating the Bicycle and Pedestrian Access 2001 program. The legislation states that

> Access to and use of transportation facilities by pedestrians and bicycle riders shall be considered and best engineering practices regarding the needs of bicycle riders and pedestrians shall be employed in all phases of transportation planning, including highway design, construction, reconstruction, and repair as well as expansion and improvement of other transportation facilities. (Maryland General Assembly, 2000).

The act also established the Director of Bicycle and Pedestrian Access within the Office of the Secretary; created the Maryland Bicycle and Pedestrian Advisory Committee; required the state to produce a 20-year Bicycle and Pedestrian Master Plan; and launched the Pedestrian Safety program.

Maryland also has a series of Smart Growth laws passed in 1997 that encourage mixed land uses, open space preservation, and walkable communities (SHA, 2007). The Maryland Department of Transportation cites the Smart Growth initiative as the reason for its increased commitment to bicycle and pedestrian

transportation (2002a). However, as in California, many of those interviewed were not aware of state level planning documents.

Maryland's 20-year Bicycle and Pedestrian Access Master Plan primarily considers conditions for bicycles and pedestrians along state highways but also serves as a motivating force for other jurisdictions. The plan includes a Bicycle and Pedestrian Facility Needs Assessment, an appendix providing a needs inventory and chronicling the physical inventory MDOT conducted on approximately 4,750 miles of roadway (MDOT, 2002a; MDOT, 2002b). According to the State's Director of Bicycle Access, Maryland is perhaps the only state required to conduct and present an annual progress attainment report on its bicycle and pedestrian efforts; it must submit this report prior to making any budget requests.

State planning infrastructure and resources

Maryland employs two full time bicycle and pedestrian staff members. Michael Jackson, the Director of Bicycle and Pedestrian Access in the Office of the Secretary at MDOT, says that he focuses on policy issues and works with local, regional, state, and federal contacts to ensure that bicycle and pedestrian access are considered in transportation projects (personal communication, December 18, 2007).

Maryland also employs a Bicycle and Pedestrian Coordinator, as required by ISTEA, who is housed within the State Highway Administration. The Coordinator manages the Bicycle Retrofit Fund and works with district offices to identify and prioritize retrofit needs. As the Bicycle and Pedestrian Coordinator herself explained, because of where the position is located, it necessarily focuses on state roads, with

little or no emphasis on expanding and coordinating local or regional bicycle and pedestrian efforts (S. Yanovitz, personal communication, December 27, 2007).

The Maryland Bicycle and Pedestrian Advisory Committee (MBPAC), formed in 1991 as the Bicycle Advisory Committee, advises state agencies on issues related to bicycling and pedestrian projects, Safe Routes to School, and other programs. The MBPAC added pedestrian issues to its mission in 2000 (MDOT, 2007).

State disbursement of federal funding

Maryland does not sub-allocate its federal funding programs beyond the minimum required in federal law (primarily the STP Urbanized program). The state directly administers both the Transportation Enhancements program and the CMAQ program. Transportation Enhancement dollars are the most highly recognized source of bicycle and pedestrian funding in the Baltimore Region. Yet, there are significant barriers to their use. The state requires a 50% local match, meaning that the local jurisdiction must contribute at least half of the total cost of the project. Staff at the National Transportation Enhancements Clearinghouse determined that Maryland's matching requirement for this program is the highest in the nation, and much higher than the national average of 26% (T. Hadden Loh, personal communication, December 2008). In personal interviews, several local and regional planners noted that they do not apply for TE funds for bicycle and pedestrian projects because of this high matching requirement (J. Bridges; T. Carr, December 28, 2007; M. Jackson; B. Muldoon, January 4, 2008; K. Schlabach, December 13, 2007). According to Doug Simmons, the Maryland Highway Administration's Deputy Administrator, the high matching requirement increases local ownership of projects

and magnifies the impact of limited TE dollars (personal communication, December 20, 2007).

The Maryland Department of Transportation has primary responsibility for Maryland's CMAQ program, but the BRTB holds a competitive selection process to advise the state and help award funds from the CMAQ program. Winning CMAQ funds requires demonstration of a significant air quality improvement, usually using traditional transportation modeling techniques, which focus on automobile travel. Jamie Bridges at the BMC explained that most bicycle and pedestrian projects show only small air quality impacts, making these projects much less competitive in the application process (personal communication, 2008 December 11, 2007). Maryland provides no manual equivalent to the California Air Resources Board CMAQ document. According to FHWA reports on the CMAQ program through 2000, no bicycle and pedestrian project in Maryland used CMAQ funding from 1992 through 2000 (Federal Highway Administration (FHWA), 2008).

Maryland's Safe Routes to School (SRTS) program, which receives approximately $2 to $3 million a year in federal dollars, is in its third grant cycle and many jurisdictions are using these funds for small infrastructure improvements and bicycle and pedestrian programs. At this time, the Baltimore region, via the BRTB, has not applied for SRTS funds for a regional project.

State Funding

Maryland has instituted three funds that can be used to build bicycle and pedestrian facilities: the Sidewalk Retrofit Fund, funded at approximately $2M annually and instituted in the late 1990s,, which will fund 100% of projects on state roads and 50%

of projects on neighborhood streets; the Bicycle Retrofit Fund, funded at approximately $1.5M annually and instituted in the early 2000s, which funds on-street improvements that do not require right-of-way acquisition; and the ADA Retrofit Fund, funded at approximately $3M annually, and instituted in the mid-2000s. The SHA has persuaded the General Assembly to maintain these funds despite years of negative or zero revenue growth for the state (D. Simmons, personal communication, December 20, 2007).

Regional Policy, Infrastructure and Funding

Our case studies focus on the regional level, and there are many differences between Sacramento and Baltimore. Again, the policy intent in both regions is to invest in bicycle and pedestrian infrastructure, but different histories, decision-making structures, and resources have resulted in different outcomes.

Sacramento

Regional policy

The 2006 Sacramento Metropolitan Transportation Plan (MTP) seeks to "develop a fully-integrated, multi-modal transportation system to serve as a catalyst to enhance the quality of life enjoyed by the current and future residents of the Sacramento region" (Sacramento Area Council of Governments (SACOG), 2006, p. 16). The plan envisions "major increases in rail, bus, bicycle and pedestrian facilities" (p. 20) and sets a goal of allocating as much as $350 million to regional bicycle and pedestrian projects over the life of the plan.

The 2006 plan showed a stronger commitment to bicycling and walking than the 1990 plan, which asserted of walking and bicycling, "while these activities have

traditionally been recreational pursuits, bicycling and walking are significant parts of the regional transportation mix" (SACOG, 1990, p. 90). However, both plans suggested the same type of bicycle and pedestrian projects.

Another important planning and policy process in Sacramento has been the extensive scenario planning exercise called the *Sacramento Blueprint Land Use and Transportation Study*. In 2004 the region chose a compact development scenario that has guided transportation and land use policy. (SACOG & Valley Vision, 2007)

In 2004, SACOG adopted the *Regional Bicycle, Pedestrian and Trails Master Plan*, a long-range planning document, dealing specifically with bicycle and pedestrian modes. Overall, the plan is "oriented toward utilitarian trips and emphasizes regional connectivity and connections to transit systems" (SACOG, 2007a, p. 7).

In addition to state and regional planning, the quality of the bicycle and pedestrian environment depends on local planning. The attention paid to bicycle and pedestrian modes in the General Plans for each county and city in the SACOG region ranges from limited to significant. For a detailed analysis of these plans, see the full case study in appendix B.

Regional Infrastructure and resources

Currently, SACOG employs one designated bicycle and pedestrian planner. Bicycle and pedestrian planning resources at the city and county level varied significantly. (See appendix B for details.) All counties had a separate bike/ped plan as of 2006, a requirement for applying for state Bicycle Transportation Account funding. Two of the six counties in the region, Sacramento and El Dorado, employ a bike/ped

coordinator, and Sacramento and Yolo counties are the only ones with bike/ped commissions. Five of the 21 cities in the region have bike/ped coordinators and three have bike/ped commissions (See Table B-9.); almost all have separate bicycle and pedestrian plans.

The City of Davis is widely recognized as a national leader in bicycle planning. There are numerous factors behind this success (Buehler & Handy, 2007), but local development policies, including the general plan and the zoning code, have clearly played a role. In particular, policy requires developers to contribute to bicycle and pedestrian infrastructure, whether by providing new infrastructure directly or by paying fees that support the city's greenbelt network. In addition, the general plan limits roads to no more than four lanes and dictates that businesses provide bike racks. Although a bike/ped plan establishes policy direction (City of Davis, 2006), the General Plan provides a mechanism for implementing those policies (T. Bustos, personal communication, September 18, 2007).

Sacramento also has a strong history of innovative planning and incorporating bicycle and pedestrian modes into transportation projects. The City of Sacramento adopted Pedestrian Friendly Street Standards in 2004. In late 2005 a citizen commission completed a Sacramento Complete Streets Best Practices Guide to designing streets for all users in the city (Sacramento Transportation and Air Quality Collaborative, 2005). In Sacramento County, a sales tax measure first passed in 1988 and renewed in 2004 included a requirement that all projects it funds must provide for bicycle and pedestrian travel. (Sacramento Transportation Authority, 2004, p. 11).

Regional Programming of Federal Funds

SACOG is responsible for the programming of federal and state transportation funds for four of its six counties; El Dorado and Placer counties do their own programming. The metropolitan transportation plan (MTP) outlines how these transportation funds are expected to be spent. Because of California's extensive sub-allocation, SACOG has been able to tailor a funding structure to the region's needs, distributing federal funding into this structure. The *MTP for 2025* (adopted in 2002) was based on an expected $22.5 billion in funding over 23 years. Of that, roughly half was allocated for transit operations and street maintenance, with the other half dedicated to improvements (SACOG, 2002; p. 6-7). Improvement funds are allocated to transit (22%), state highways (22%), and local streets (41%), and 13.6%, or $1.5 billion out of the approximately $11 billion available, goes to "other improvements" (SACOG, 2002), under which most bike/ped-specific projects fall.

In this "other improvements" category, SACOG has established six regional programs: the Bicycle Pedestrian Funding program (BPFP), the Community Design Funding program (CDFP), the Air Quality Funding program, Transportation Demand Management, Regional Scale, and Local. (See Table B-10 for details.) Money for these programs comes from the federal funding programs discussed earlier, including Congestion Management and Air Quality (CMAQ) program, the Transportation Enhancements (TE) program, and the Surface Transportation program (STP). Therefore, selected projects must qualify for these federal funding sources. In addition, a local match of 11.47% is often required.

The Bicycle Pedestrian funding program and the Air Quality funding program fund a majority of SACOG's bike/ped projects, with most of the money coming from the federal CMAQ program. In order to be eligible for CMAQ funds, projects must demonstrate that they will result in a measurable reduction of pollution emissions. Project applicants use the emissions calculations tools provided by the California Air Resources Board manual discussed in the state section, above A former planner at SACOG noted that CMAQ is ideal for bicycle and pedestrian projects, because the funding is restricted to projects that benefit air quality, and bike/ped projects are "easier to implement, smaller and cheaper." (N. Kays, personal communication, 2007).

The Community Design Funding program (CDFP) also funds a significant number of bike/ped projects. The CDFP is intended to help communities implement physical development that is consistent with SACOG's long-range Smart Growth plan, the Blueprint Land Use and Transportation study. Principles in the Blueprint include Transportation Choices, Housing Diversity, Compact Development, Mixed Land Uses, and other factors. One of the sub-categories of the program is Complete Streets, "to provide funding for the transformation of transportation corridors to more pedestrian and transit friendly streetscapes with an associated transition in land uses" (SACOG, 2007b, p. 10). Transportation Demand Management funds are used to support non-infrastructure promotion of bicycling and walking. The Regional Scale funding program is mostly used for large roadway projects, which sometimes include a bike/ped component.

In addition to state and federal funding, local sources play a significant role in funding bike/ped projects. For example, the City of Davis has funded bicycle projects through a variety of local sources including development fees and air district fees. Indeed, the City of Davis Comprehensive Bicycle Plan (2006, p. 25) states "Bikeways in Davis may be funded from the full range of financial resources available to the city."

Baltimore

Regional Policy

The region's most recent long range transportation plan (LRTP), *Transportation Outlook 2035: Creating a Blueprint for the Baltimore Region's Future* includes considerable discussion of the bicycle and pedestrian transportation modes. In addition to listing planned bicycle and pedestrian projects, the LRTP acknowledges the potential of biking and walking as viable commuting modes, indicating that increased walking and bicycling could reduce congestion and improve air quality (Baltimore Regional Transportation Board [BRTB], 2007, p. 8)

Two prior plans are most revealing about the evolving thinking in the region: the 1993 plan, the first written by the newly-formed BRTB, includes a section on non-motorized transportation and discusses ISTEA's planning requirements for non-motorized travel (Baltimore Metropolitan Council [BMC] 1993, p. 116). In 1986 the Regional Planning Council wrote what would turn out to be its last transportation plan before the reforms of ISTEA changed transportation planning. It makes no mention at all of bicycling or walking (Baltimore Regional Planning Council, 1986).

In recent years, BRTB has also produced a regional bicycle and pedestrian plan, *Action Plan 2001: A Plan for Bicycling and Walking in the Baltimore Region* (BRTB, 2001). *Action Plan 2001* defines the vision, goals, and milestones for bicycling and walking in the Baltimore region. The regional plan outlines ten milestones for which the BMC and the BRTB Bicycle and Pedestrian Advisory Group were to "prepare a yearly report card or status report tracking the achievement of these milestones and performance measures." These performance measures have neither been implemented nor tracked. However, they do provide ideas for attainable policies and programs for local governments, including encouraging employees to walk or bike to work, adding bicycle racks in public areas, adopting bicycle parking ordinances, and accommodating bicycles on transit vehicles.

Maryland state law requires local governments to provide for bicycle and pedestrian access in their comprehensive plans. Despite this requirement, the state of bicycle and pedestrian planning varies substantially among the BMC members. Every jurisdiction at least mentions the bicycle and pedestrian modes in either its comprehensive or transportation plan, but some counties have specific plans while others only note that bicycle and pedestrian needs exist. Four of the seven jurisdictions in the region currently have a bicycle or pedestrian plan or both covering at least part of their area; several jurisdictions have recently adopted or are currently developing bicycle and pedestrian plans.

Regional and local Infrastructure

The regional transportation planning body, BRTB, does not employ a dedicated bicycle pedestrian planner. BRTB has two advisory groups that can influence bicycle

and pedestrian decisions, the more general Citizens Advisory Committee regional bicycle and pedestrian plan, provides technical assistance to the BRTB and its members, and collaborates with federal, state, and local agencies on bicycle and pedestrian issues. The Bicycle and Pedestrian Advisory Group includes a representative from each of the BRTB's member jurisdictions as well as the Maryland Departments of Environment, Transportation, and Planning.

Of the jurisdictions within the region, only the City of Baltimore has a bicycle and pedestrian coordinator and a bicycle advisory commission. (See Table C-1.) Two jurisdictions have organizing commissions to advise on bicycle and pedestrian issues.

Regional programming of federal funds

The BRTB programs federal and state transportation funds but follows the lead of the state, which determines the fiscal constraints and categories of the Maryland Transportation Trust Fund (MTTF), dividing the funds into capital, operating, and local expenditures. Of the approximately 39% of the MTTF used for capital expenditures, the MDOT Office of Finance determines funding available for capital expansion. The regional plan, *Transportation Outlook 2035* (BRTB, 2007) follows this pattern. Expansion funding includes three main categories of expenditures: highways and interchanges at 69%, transit at 25%, and "other", which includes transportation demand management programs, bicycle and pedestrian projects, and maintenance and operations for new projects. The "other" category receives 6% of the expansion funding. Bicycle and pedestrian projects are allocated 1%,

approximately $62 million, of the total expansion budget. (Figure C-5 illustrates the allocation of the expansion budget.) (BRTB 2007).

Each of these categories has its own selection criteria, so bicycle and pedestrian projects are not competing with mainstream highway projects for funding. The region has an established set of selection criteria for non-motorized projects. But in fact the region has a policy to fully fund all submitted bicycle and pedestrian projects as a first step in determining the allocation of the 6% in 'other' funds (J. Bridges, personal communication, 2008). This is intended to prioritize bicycle and pedestrian improvements, but is also done because the requested projects are such a small portion of the overall total. If local agencies proposed more projects, the region's established selection criteria would become more relevant. It is also important to note that many non-motorized transportation projects are not considered the type of long-range capital improvements that are included in the long-range plan. Smaller projects can be built quickly with other funds, or included in the course of other improvements.

Other Influences

Sacramento

Two advocacy groups are most often given credit for advancing the cause of non-motorized transportation in the Sacramento region. The Sacramento Association of Bicycle Advocates (SABA) formed in 1991 and incorporated as a 501(c)3 nonprofit organization in 2003. Currently SABA has more than 1,400 members in the six-county Sacramento region. The organization has been instrumental in getting bicycle facilities built in the region and assuring that bicyclists are considered in policies and

planning. Walk Sacramento was incorporated in 1998 to address pedestrian issues in the region. In recent years, the organization has effectively participated in the review of proposed development projects in the City of Sacramento to ensure adequate consideration of pedestrian concerns. In a 2007 interview, SABA president Anne Geraghty noted that one of the most important factors of success is just being present, “Now, by being at the table, our views get considered.”

In Sacramento, interagency partnerships have also been an important factor. Local jurisdictions have sometimes pushed bicycle and pedestrian interests from below. The cities of Sacramento and Davis, as noted earlier, have been national leaders in the areas of pedestrian and bicycle planning, respectively. Lateral influences have also become important. For example, the Department of Health Services is now a major player motivated in part by the governor’s interest in exercise and fitness. According to a Caltrans employee, “everybody marches to that tune. Exercise, fitness, health, etc… that gets the Department of Health Services on board…they’re on every committee that we have here at Caltrans” (K. McGuire, personal communication, 2007). The same employee later noted that Sacramento Metropolitan Air Quality Management District (SMAQMD) has also been a supportive partner in efforts to increase walking and bicycling (personal communication, 2008).

Baltimore

One Less Car, a Baltimore based advocacy group established in 1999, is the primary bicycle and pedestrian advocacy organization in the Baltimore region, but their emphasis has been on state level policy. While some of the local jurisdictions

noted that advocates play a role on a project-by-project basis, none felt that advocacy organizations were systematic in their efforts or were responsible for the current state of bicycle and pedestrian planning in the community. However, they noted the importance of individual biking and walking advocates. Most jurisdictions rely on bicycle and pedestrian advocates to help identify needed improvements and possible locations for bicycle and pedestrian facilities. The role of advocacy groups appears to be stronger in Baltimore City and Annapolis, where they serve on the bicycle and pedestrian commissions and helped to develop the bicycle and pedestrian plans.

The City of Baltimore is committed to innovation in bicycle and pedestrian planning, but this is a recent development and the region appears to have fewer interagency partnerships than in Sacramento. While the state has a significant commitment to bicycle and pedestrian infrastructure, it is noteworthy that most local jurisdictions maintain that the state has little impact on local bicycle and pedestrian planning. They perceive that the state bicycle and pedestrian program focuses on state highways and not on helping local jurisdictions. More assistance comes from the Baltimore Metropolitan Council than from the state. The BMC provides a forum for encouraging bicycle and pedestrian planning, identifying regional needs, and coordinating regional programs and trails. The BMC also provides significant educational opportunities for local staff. Membership on the BRTB Bicycle and Pedestrian Committee is often the only formal link local staff have to bicycle and pedestrian activities.

Chapter 3: Conclusions from the Case Studies

The case studies suggest that the impacts of federal funding for bike/ped projects depend strongly on state policy and the response of the MPOs to the opportunities that federal and state policies create. The experiences of both regions with the CMAQ program illustrate this point. The case studies also point to other important factors: the degree of regional control, the presence of plan-oriented programs, institutionalization and resources, the existence of local government support, and the presence of advocates.

Lessons from the Case Studies

Institutionalization and Resources

Both communities have strong language supporting bicycle and pedestrian investments in their planning documents; however, the Sacramento Area Council of Governments has a longer track record and greater institutionalization than the Baltimore Regional Transportation Board. SACOG employs a dedicated bike/ped planner, has a regional bike/ped-specific spending category, as well as other programs open for bike/ped investment. The region also accounts for bicycle and pedestrian travel in its travel demand forecasting model. These resources are supplemented by strong institutionalization at the state level, with state and district bicycle coordinators, long-standing state funding programs, and the requirement that access to state bike/ped funds can be obtained only after a locality has a written bicycle plan. Partially as a result, local institutionalization is also extensive: almost every county and city has a bike/ped plan, and several employ bike/ped coordinators. State law also allows local communities to directly raise funds that can

be used for such projects. As a result, the Sacramento region has an overlapping web of people employed to plan non-motorized transportation projects, guided by many planning documents, with a variety of financial resources at their disposal.

In contrast, the Baltimore region has very few people working full time on bicycle and pedestrian projects. The existence of regional and local planning documents is spotty, and financial resources are viewed as limited to a few narrowly defined programs, most of which are administered not at the regional level, but by the state. In fact, institutionalization in Maryland appears to be most advanced at the state level, with the existence of a state Complete Streets law and some special funding categories. However, regional informants felt they had limited connection to the state bike/ped planners whom they believe focus primarily on state roads.

In addition to limited resources at the regional level, a lack of institutional support at the state level has hampered the Baltimore region's ability to use federal dollars on bike/ped projects. The region is unable to overcome restrictive state requirements, including the high local match required for Transportation Enhancements projects, (50% compared to Sacramento's 11.47%.), and modeling and air quality calculation tools that do not allow recognition of the benefits of non-motorized projects. Despite these handicaps, the region has funded a significant number of successful bicycle and pedestrian projects, although they are not as varied as Sacramento's, with most funding going to multi-use paths and streetscapes.

Regional Control

Compared to Baltimore, Sacramento's higher per capita spending on bicycling and walking and its pattern of using a greater variety of federal funding programs, including CMAQ, both indicate that sub-allocation may be helpful in increasing investments in bicycle and pedestrian infrastructure. While Maryland's state program is quite supportive of bicycle and pedestrian travel, financial support for bicycle and pedestrian projects at the state level is achieved primarily through individual project applications to the Transportation Enhancement program. The MPO separately designates a small portion of its sub-allocated STP funds for bicycle and pedestrian projects. In Sacramento, full sub-allocation has allowed the region to integrate its funding and directly plan and implement the many varied projects that will create a comprehensive non-motorized network. Sacramento's more varied project list may also reflect this more localized approach. Sub-allocation may have given California regions more leverage to insist that the state DOT pay attention to bicycle pedestrian travel. In addition, sub-allocation may be helpful simply because MPOs and local governments pay more attention to the local streets where bicycle and pedestrian travel tends to take place, whereas state DOTs tend to be more narrowly focused on longer distance automobile travel.

The dramatic spending differences between Sacramento and Baltimore do not reflect the larger pattern described in chapter one. That comparison of spending patterns by sub-allocation across states and metropolitan areas found much more modest differences. In particular, it showed that states that sub-allocate the CMAQ program actually tend to spend less of their CMAQ money on bicycle and pedestrian

projects. Further research is needed to clarify the impact of sub-allocation on bike/ped spending.

Plan–oriented Programs

Sub-allocation is also a way to empower regional and local governments to bring funding streams more in line with community goals as expressed in planning documents. The outcome-oriented funding programs created in 2003 in Sacramento are set up to help prioritize bicycle and pedestrian infrastructure, compact community design, and other goals established through Sacramento's extensive planning processes. Planning documents in Baltimore express ambitious bicycle and pedestrian goals, but funding programs have not been adjusted to reflect this. As a result, funding tends to flow to traditional highway projects in Baltimore.

Local Government Support

The relationship between MPOs and the local governments they represent varies from region to region and is not always easily discerned. MPO boards are usually made up mostly of local government officials, and their role is often limited to facilitating the wishes of their constituents rather than collaborating to create a regional vision. On a practical level, projects are usually generated at the local level and passed up through the MPO process for federal funding. The strength of regional interests in funding decisions depends on political dynamics on the MPO board. Although we did not examine the political give-and-take that is always present in decisions over spending allocations, it appears likely that local government support for bike/ped projects had a significant effect on the priority given to these modes by the MPO. In the Sacramento region, the City of Davis made bicycle

infrastructure a priority in the late 1960s, followed by several other cities in the region over time. The City of Sacramento has had an aggressive pedestrian program for some time. In contrast, BRTB staff indicated that because a limited number of bicycle and pedestrian projects are submitted for funding in the Baltimore region, they are able to include them all without using the criteria they have established for prioritizing projects. The short list suggests that local governments in this region give bike/ped needs relatively low priority. The complex relationship between MPOs and their member cities and counties, and what that means for innovations in transportation planning, deserves closer examination.

Advocates

Most of the local officials we interviewed cited the presence and effectiveness of outside advocates as having a significant impact on bicycle and pedestrian spending. While advocates are active in both regions on formal advisory committees, in the Baltimore region the influence of advocates was felt more strongly on individual projects, pushed by individual advocates. The region's organized group focusing on the 'big picture' for non-motorized transportation, One Less Car, has focused more of its energy on state-level issues. Sacramento, on the other hand, has had a regional bicycle advocacy group since the early days of ISTEA, and has had an organized pedestrian group for ten years. These groups form one leg of what pedestrian advocacy expert Charlie Gandy has called an "advocacy triangle", pushing elected officials while also providing support for agency staff that want to plan innovations. Without such a triangle, staff with innovative ideas for bicycling and walking infrastructure may not be able to demonstrate

community support, and elected officials may not be motivated to push less innovative staff.

The CMAQ Spending Story

In our case studies, the difference between the regions is most starkly illustrated in the way they spend air quality funds distributed under the CMAQ program. In the Sacramento region, almost 45% of federal funds spent on bike/ped projects comes out of the CMAQ program. In the Baltimore region, no CMAQ dollars go to bike/ped projects. In interviews, an official in Sacramento explained that the CMAQ program "in a way almost earmarks money for bike/pedestrian [projects]," (N. Kays, personal communication, 2007) because these projects are beneficial to air quality, inexpensive, and easy to implement. In Baltimore, officials said it is difficult to show air quality impact with bicycle and pedestrian projects, making them less competitive (J. Bridges, personal communication, 2008).

Three immediate differences in the way the regions handle CMAQ may be responsible for this different approach, and two of these differences also apply to the way other funds are programmed. These differences are state sub-allocation, tailored spending programs, and tailored air quality management tools.

As mentioned in the case studies, California sub-allocates its federal transportation funds to a greater degree than any other state. This gives regional and local governing bodies control over how these funds can be spent. In the case of the CMAQ program, 100 % of these funds are sub-allocated, dating back almost to the beginning of the program. While about half of the states sub-allocate CMAQ funds, Maryland does not, leaving the program under the control of the state, which

puts bicycle and pedestrian programs at a disadvantage. Since bicycle and pedestrian projects tend to be small and highly localized, it is more difficult for them to compete in a state-administered program considering proposals for projects ranging from reduction of diesel emissions to traffic flow improvements to transit service. State agencies with a primary purpose of building and maintaining highways may favor emissions reduction projects aimed at improving automobile traffic flow; this has been the most common use of CMAQ funding nationally, capturing 42% of CMAQ funds from 2000 to 2007 (FHWA, 2008). The Sacramento case study indicates that sub-allocation increases the chances that funds will be used for bicycle and pedestrian projects. Regional and local governments are more aware of the potential air quality benefits of bicycling and walking modes due to direct experience and/or citizen advocacy. Also, the level of detail required to effectively plan and institute non-motorized networks is something best done at the regional and local level.

Sub-allocation helped create the conditions for the second factor that may influence the CMAQ spending pattern, and in fact all spending: the presence or absence of tailored spending programs. In 2003 SACOG created a number of spending programs aimed at very specific outcomes, distributing funds from three federal programs into these tailored programs, including CMAQ funds. The Air Quality program helps the region meet air quality reduction goals, and emphasizes cost-effective projects with a permanent impact (SACOG, 2005). The goal of the Bicycle and Pedestrian program is to provide facilities for walking and biking in the cities and towns of the region, or to provide connections between them. The

Transportation Demand Management program aims to lower the demands made on the road and highway system and improve air quality by encouraging the use of carpooling, vanpooling, public transit, bicycling and walking. The Community Design program seeks to better coordinate transportation and land use. This emphasis on creating outcome-oriented spending categories has helped free the Sacramento-area program from a traditional mode-oriented approach to transportation spending that is more evident in the Baltimore region. The Baltimore region's spending categories for the most part remain divided by mode, with highways, local roads, transit, and "other" project categories, including a bike/ped sub-category. Bicycle and pedestrian spending remains locked into a single program category. The spending categories themselves tell applicants little about the region's intent in funding these transportation projects. In Sacramento, bicycle and pedestrian projects are eligible for funding to reach air quality and community design goals, as well as goals related to completing the bicycle and pedestrian network.

Two of the federal sources that fund the new Sacramento programs, Transportation Enhancements and CMAQ, already have an outcome orientation, but are broadly written to allow a wide variety of uses and do not reflect community intent in the same way as the Sacramento programs. For example, Transportation Enhancements defines 'enhancements' to include not just direct transportation projects such as multi-use paths, but also removal of outdoor advertising and establishment of transportation museums. MPOs may use visioning or comprehensive planning processes to determine exactly which type of 'enhancements' they value, but those values are not reflected in the federal program

eligibility. The federal CMAQ program gives wide latitude in how communities tackle emissions reduction, making eligible everything from highway capacity expansion to transportation demand management. Some communities have chosen to use these funds primarily to reduce traffic congestion, while others have prioritized decreasing the need to drive. By creating more targeted programs, SACOG's funding streams more clearly express the region's philosophy and intent in each program area.

Sacramento's use of CMAQ funds is likely due in part to tailored evaluation tools that help the region quantify the air quality benefits of bicycle and pedestrian projects, tools that are not present in Baltimore. The region's transportation model has taken bicycle and pedestrian travel into account for 15 years, and includes a Pedestrian Environment Factor. The Baltimore model has only recently begun to include bicycle and pedestrian travel in any significant way. California designed its emissions calculation manual, cited by the FHWA as a best practice, to help regions quantify the often difficult-to-calculate benefits of bicycle and pedestrian projects; Maryland provides no such tool. In addition, the Sacramento region's emphasis on cost-benefit analysis, also a FHWA recommended best practice, means that bicycle and pedestrian projects, which often show limited air quality benefits, can compete because they are so inexpensive.

Chapter 4: Impact on Behavior

While we have shown that different state and regional conditions have an impact on bicycle and pedestrian investments, a larger question is whether these investments have had an impact on physically active travel: are they helping encourage additional bicycling and walking trips?

The existing literature strongly suggests that the answers to these questions would be 'yes.' The safety benefits of well-designed bicycle and pedestrian infrastructure are well documented (Campbell, Zegeer, Huang & Cynecki, 2004). The addition of bicycle lanes encourages correct riding behavior (Wachtel & Lewiston, 2004, pp. 30-35); sidewalks and pedestrian medians have a dramatic impact on pedestrian safety. (King, Carnegie & Ewing, 2003, pp. 56-66)

The literature also suggests that infrastructure helps encourage use of bicycling and walking facilities (Ewing & Cervero, 2001). For example, a study of U.S. cities over 250,000 population found that each additional mile of bike lanes per square mile is associated with a roughly 1% higher share of workers commuting by bicycle (Transportation Research Board [TRB], 2004). Health researchers have also found strong associations. . One of the most recent studies found that residents in more 'walkable' neighborhoods in Seattle and Baltimore got 40 to 50 more minutes of physical activity than those who lived in less walkable areas in those cities, regardless of income levels (Sallis et al., 2009). A joint review by the Transportation Research Board and the Institute of Medicine (Committee on Physical Health, etc. of the TRB, 2005) concluded that the built environment influences physical activity levels, and the Centers for Disease Control has found that infrastructure that is more

conducive to bicycling and walking is positively linked to the percentage of adults who get the recommended 30 minutes of physical activity each day (CDC, 2005; Kerr, 2008). However, previous studies focused on the impact of individual projects or used cross-sectional study designs. To our knowledge, this study is the first to relate bicycle and pedestrian infrastructure investments to changes in walking and bicycling over time across a metropolitan region.

Our team hypothesized that the investments in walking and bicycling facilities since 1991 should have resulted in higher walking and bicycling rates. Our analysis is limited by deficiencies in the available data on both infrastructure investments and walking and bicycling activity. For instance, we could not determine when facilities were completed, and it is unclear how long it takes for a new facility to encourage additional use. We are also unaware of any evidence around important issues of geography, such as how close people need to live to a facility to be influenced to use it, and how several small improvements would influence use. Nevertheless, the results provide some support for our hypothesis.

Study design and methods

This study took advantage of "natural experiments" that occur routinely as metropolitan areas build pedestrian and bicycle infrastructure. For the metropolitan areas studied, Sacramento and Baltimore, the availability of regional household travel surveys for two different years allowed us to study changes in walking and bicycling for subareas known as "minor zones" in Sacramento and "traffic analysis zones" in Baltimore. Sacramento's surveys were conducted in 1991 and 2001, Baltimore's in 1993 and 2001. We examined the relationship between changes in

walking and bicycling in these areas and expenditures on pedestrian and bicycle infrastructure in those zones between the two survey years. The construction of such facilities constitutes the “treatment” in this natural experiment. In this quasi-experimental design, we statistically controlled for changes in socioeconomic and land use characteristics that occurred at the zone level between the two years. We measured the change in median household income for each zone and the change in activity density within the zone. Most zones grew in population and employment, and hence became denser and more urban. Many experienced changes in relative household income. The need for consistent data across survey years and metropolitan regions limited us to these control variables.

Data and Measures

To obtain walk and bike trip frequencies by zone, we aggregated individual trip records for the travel surveys to the zone level. Note that travel diary surveys were originally designed to collect data on vehicle trips and are widely believed to miss many non-motorized trips, particularly those for recreational purposes. However, as long as the methodology for identifying such trips was the same for the two surveys used within each region, the change in counts should provide a good estimate of the trend in walking and bicycling.

We were not able to locate a readily available list of completed bicycle and pedestrian projects in either region. Instead, we relied primarily on the federally required transportation improvement programs (TIPs) for the regions. This source lists programmed projects rather than completed projects, leaving open the possibility of inaccuracies in the actual year in which the project was completed and

at what cost. In addition, projects were not of a common type or always neatly classifiable, and descriptions of projects and their locations were often vague. In many cases, descriptions of highway projects included sidewalk improvements or bicycle lanes, but it was not possible to separate out the portion of the project cost related to these facilities, and we generally left them out of this analysis.

In order to assign projects to zones, we manually geocoded projects in ArcGIS based on project descriptions. For both regions, we calculated buffer areas of ¼- and ½-mile for all of the geocoded projects. We prorated project costs by zone according to the proportion of zone area falling within the buffer, and then summed these project costs over all projects constructed between survey years to yield total spending for each zone.

Models

The extent of pedestrian and bicycle infrastructure available to zone residents changed in the years between surveys. As noted above, we estimated spending variables for ¼- and ½-mile buffers around pedestrian and bicycle facilities constructed between the survey years. For the models in Baltimore, we tested spending on trails, sidewalks and streetscapes, whereas we tested spending on trails, sidewalks, and bike lanes in the models for Sacramento. Note that Baltimore had streetscape projects but not bike lane projects, while Sacramento had the reverse, as discussed below.

We structured the models to test for the effect of investments in pedestrian and bicycle infrastructure on bicycle and pedestrian trips while controlling for other changes in the zone. As a baseline, we incorporated the expected number of trips if

nothing other than population and employment in the zone changed between years. The expected numbers of trips were calculated using the share of walk and bike trips in the zone in the earlier survey applied to the total number of trips in the zone in the later survey. Higher expected numbers of walk or bike trips should of course be associated with higher actual numbers of walk or bike trips, all else equal. We then incorporated changes in household income and changes in activity density in the zone into the model, based on the expectation that increases in income would to lead to fewer walk or bike trips but that an increase in activity density would to lead to more walk or bike trips. Finally, expenditures on pedestrian or bicycle infrastructure in the zone were added to the model to test the hypothesis that the number of walk and bike trips would increase in response to these investments. Please see appendix A for a more thorough explanation of our analysis methods.

Results

Investments

Tables 7 and 8 summarize projects and spending between the survey years for stand-alone pedestrian and bike projects, as identified in the MPOs' transportation improvement programs. During this period, the overall spending levels were approximately the same in the two metropolitan areas, but the types of projects built differed considerably. Table 7 shows that the largest category of infrastructure spending in Baltimore is streetscape improvements. These are expensive, aesthetically oriented projects and the benefit to pedestrians and bicyclists is often incidental. The second largest category of spending is off-road paths and trails. These are also expensive projects. The third category is sidewalks. These are

mostly retrofits, and there are many small projects. No bike lane projects were identified separately in the Baltimore TIPs.

	Project Count	Total Spending	Avg Spending per Project
Trails	21	$17,794,000	$847,333
Sidewalks	41	$2,066,000	$50,390
Streetscapes	34	$23,817,000	$700,500

Table 5. Spending on Bicycle and Pedestrian Facilities in Baltimore, 1993-2001

By far the largest category of infrastructure spending in Sacramento is off-road paths and trails, as shown in Table 8. The second is on-street bike lanes. A distant third, in number and dollar value, is sidewalk improvements. The level of investment in sidewalks is doubtless underestimated, because they are often constructed as part of road improvement projects. They tend to be a small part of large projects, and are not mentioned in TIPs nor broken out as separate budget items. In addition, it is likely that some sidewalk projects were entirely locally funded and not listed in the TIP.

	Project Count*	Total Spending*	Avg Spending per Project
Trails	34	$26,840,201	$789,418
Bike Lanes	30	$12,156,957	$405,232
Sidewalks	4	$1,887,000	$471,750

** Three projects providing both bike lanes and sidewalks are double counted in project and spending totals.*

Table 6. Spending on Bicycle and Pedestrian Facilities in Sacramento, 1991-2000

Changes in Walking and Bicycling

Changes in walking and bicycling were expected to track with investments. Table 9 shows aggregate mode shares and trip counts for the two regions. Again, the modal picture is more complicated than envisioned. Walk mode shares were higher in both years for Baltimore than Sacramento, and declined more in Sacramento. Bike mode shares were higher in Sacramento, but declined more between survey years despite substantial bike facility investments.

	Baltimore		Sacramento	
	1993	2001	1991	2000
Mode Share				
Walking	12.60%	12.40%	6.40%	5.00%
Bicycling	0.70%	0.50%	2.70%	1.60%

Table 7. Regional Mode Shares and Counts

Baltimore

The models for walk trips for Baltimore have moderate explanatory power. (See tables in appendix C for details.) The model shows that an increase in median household income in the zone is associated with a decline in walking, but that change in density is not a significant predictor of walk trips. Although neither spending on trail projects nor sidewalk projects is significant, spending on streetscape projects was found to have a significant positive impact on walk trips. While these projects tend to be large ones in which attention to bicycles and pedestrians is incidental, the improvements appear significant enough to induce an increase in walking and bicycling.

The models for bicycle trips in Baltimore also have moderate explanatory power for both the ¼-mile and ½-mile buffers. In both models, spending on trails projects is significantly associated with more bicycle trips. These projects are often geared toward recreational use but may nevertheless facilitate utilitarian bicycling as well, even if they have little impact on utilitarian walking. In the model for the ½-mile buffer, spending on streetscape projects has a marginally significant impact on the number of bicycle trips. Neither changes in income nor changes in density are associated with bicycle trips in either model.

Sacramento

The walk trip models for Sacramento do a poorer job than the models for Baltimore in explaining variation in walk trips across zones. As in Baltimore, the greater the increase in median household income, the fewer the number of walk trips. Spending levels for trails and sidewalks are not significant. A possible explanation is that most

trail expenditures are for “bike paths” or “bike trails,” which may not connect well to destinations. Sidewalks investments are limited in our database, but as previously noted, we had difficulty identifying independent sidewalk investments from our data source. We did not find a relationship between trail and sidewalk investments and walking for utilitarian purposes.

The bike trip models did a better job of explaining variation across zones. The number of bike trips increases as median household income declines and as activity density increases. Spending on off-road trails had no effect on utilitarian bicycling, but spending on bike lanes had a small but significant positive effect.

Discussion

These results provide evidence of a significant effect of selected types of infrastructure investments on bicycling and walking for utilitarian purposes, despite limitations of the available data. The longitudinal study design, with controls for changes in income and activity density, provides stronger evidence of a causal effect than prior cross-sectional studies. The ability to show some effect of investment across the metropolitan region is also noteworthy, as past research has focused on the impact of individual projects. That bicycle and pedestrian investments were shown to have a positive effect in two very different regions is also encouraging. More accurate measures of both investments and bicycle and walking trips would likely produce even more conclusive results.

The low quality of available data on walking and bicycling infrastructure and use hinders future research in this area. Very few places have consistently taken accurate counts of non-motorized activity, making such longitudinal research

challenging. The National Bicycle and Pedestrian Documentation Project is a promising beginning, with its attempt to standardize methodology and use of annual bicycle and pedestrian counts (Alta Planning & Institute of Transportation Engineering Pedestrian and Bicycle Council, 2009). Bicycling and walking infrastructure is also rarely tracked. Ideally MPOs, in partnership with state departments of transportation and local governments, would maintain databases on completed projects, rather than just programmed projects, with accurate information on timing of completion and actual costs. Also needed is a way to estimate spending on bicycle and pedestrian facilities when they are included in larger roadway projects. Thought should also be given to ways of measuring the scale of projects other than by their cost; for example, length of bikeways or sidewalks might be used, although sometimes shorter projects can be more important than longer projects depending on their impact on the overall bicycle and pedestrian network.

Chapter 5: Conclusions

In this study, we set out to examine the effectiveness of federal policies that increased flexibility in funding programs to bring about positive changes for bicycling and walking. We examined several types of changes: investments in bike/ped infrastructure, the institutionalization of bike/ped concerns in the regional planning process, and actual levels of walking and bicycling. Our findings are clearest for the first type of change, least clear for the last.

It is clear that absolute investments in bicycle and pedestrian infrastructure have increased dramatically since the passage of ISTEA in 1991, from $11.6 million in 1992 to $363 million in 2006. This is also a significant increase in the share of federal funding going towards bike/ped infrastructure. However, bike/ped infrastructure spending remains a small share of the largest highway-related programs, particularly STP. In addition, the share of federal funding going towards bike/ped projects varies considerably across metropolitan regions.

The second indicator we studied, institutionalization of bike/ped concerns in the planning process, partially explains this regional variation. It is clear that regions like Sacramento, where bike/ped programs were in place before ISTEA, were in a better position to take advantage of the opportunity that ISTEA created. It also appears that federal policy, including the flexibility to invest federal funds in bike/ped infrastructure and the requirement that states employ bike/ped coordinators, helped to further the institutionalization of bike/ped concerns in the planning process.

Whether the additional investments in bike/ped infrastructure had a significant impact on walking and bicycling is less clear. In Sacramento and Baltimore, our analysis shows small though statistically significant effects on walking and bicycling. However, the analysis is hampered by significant limitations in the data on both investments and behavior; these limitations are themselves a symptom of the meager resources devoted to non-motorized transportation. Still, it seems unlikely that the investments made so far have brought about a substantial change in behavior in the regions studied. What remains to be seen is whether sustained investments will create a more substantial shift over time.

Our case studies suggest that the regional impacts of federal funding for bike/ped projects on both investments and institutionalization depend strongly on state policy and the response of MPOs to the opportunities that federal and state policies create. In Sacramento, with support from state policy, the MPO effectively used federal funding to carry out well-established goals for non-motorized transportation. In Baltimore, state policy created barriers that made it more difficult for the MPO to leverage federal funding to meet its newly established goals for non-motorized transportation. The low level of institutionalization of planning for these modes further hindered their achievement.

In short, the effectiveness of federal funding for bike/ped projects has so far depended on state and regional policy. While there are clear advantages to this strategy in terms of encouraging innovation and local control, the national interest in promoting active living and non-motorized transportation modes requires federal policy makers to consider ways to increase use of federal funds for these programs.

Each of the factors identified in the case studies suggests a potential solution. For example:

- Pass more funding directly to MPOs, rather than routing it through state DOTs, thereby reducing the effect of differences in sub-allocation.
- Design funding programs to achieve specific outcomes and develop outcome-oriented performance measures of success. Alternatively, encourage states and regions to create their own programs that tie funding more tightly to local planning goals.
- Provide more tools to state and local governments to help bike/ped projects meet eligibility requirements such as demonstrated emissions reductions.
- Prohibit states from requiring more than the specified federal match. Note that while this strategy makes it easier for local governments to fund projects, it also potentially reduces the total number of projects leveraged by the federal funds.
- Introduce further requirements for institutionalizing non-motorized transportation planning in order to enhance the capacity of MPOs to meet their goals for bike/ped modes.
- Continue to emphasize public involvement in the planning process in order to ensure opportunities for local advocates to shed light on bike/ped needs and work with planners to support improvements. Institutionalizing the involvement of health departments and other public agencies that support

biking and walking for non-transportation reasons could also elevate the priority they are given.

In recognition of the importance of non-motorized modes, the federal government could choose to follow the California model to assert stronger leadership in improving conditions for bicyclists and pedestrians. That state, which has passed significant funding control to regional and local governments, has nonetheless established a clear statewide plan for non-motorized travel, adopted a statewide complete streets policy, and required bicycle/pedestrian plans as a condition of receiving some funds. The state also funds a robust state-level bike/ped staff – one that is in fact larger than the current FHWA bike/ped planning staff. These policies have created a climate throughout the state in which consideration of bicyclist and pedestrian needs in transportation planning is the norm.

The findings of this paper, and in particular the limited application of most federal programs to bike/ped improvements, is due in part to the expertise of state DOTs, institutions that have spent decades perfecting the delivery of high-speed highways. Following the passage of ISTEA, these organizations faced major organizational and technical challenges in shifting to a more multi-modal approach. The first wave of outside support for these changes came from MPOs and local governments concerned with congestion and air quality. More recently, public health officials have demanded recognition of the role our transportation system plays in promoting obesity by making physically active transportation modes difficult or dangerous. While these voices are increasingly effective, federal leadership may be necessary to induce agencies to adopt the extensive policy and procedural changes

necessary to plan and deliver transportation systems that serve people on foot or bicycle as well as those in automobiles. These changes are the next step toward the effective use of federal transportation funding to encourage walking and bicycling.

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APPENDIX A

Methodology

Appendix A: Methodology

Chapter 1: Federal funding for pedestrian and bicycle improvements: Sources and patterns of spending

To analyze national and regional spending patterns of federal transportation funds, we used the Federal Highway Administration's (FHWA) Fiscal Management Information System (FMIS) for the years 1991-2006. This database is seldom used for in-depth program analyses because of its complex and opaque structure, but it is extraordinarily rich, with information on over $30 billion in annual federal spending on transportation. The database provides details on obligations[4] of federal highway funds by type of project, funding program, and location, as well as dozens of other variables. The database covers the majority of the funding allocated through the federal transportation authorization, which flows through the Federal Highway Administration. Public transportation funding is administered separately through the Federal Transit Administration and was not analyzed. For this analysis, we looked at the years when funding was provided under the Intermodal Surface Transportation Efficiency Act (ISTEA), the Transportation Equity Act for the 21st Century (TEA-21), and the first years of SAFETEA-LU (with an acronym too tortured to go into). We mined this database for spending on projects classified as bike/ped improvements and to identify the federal programs used to fund each project. The database tracks spending at the county level, so our analysis used metropolitan statistical areas as the unit of analysis, which are defined by county borders, rather than MPOs, which

[4] The Federal Highway Administration (FHWA) defines obligations this way: "The Federal government's legal commitment (promise) to pay or reimburse the states or other entities for the Federal share of a project's eligible costs" (FHWA 2007).

do not always coincide with county boundaries. We also examined FHWA notices and apportionment tables to determine the amount of funding available by program for each state. We calculated per-capita spending rates using population figures provided by the US Census, and focused our analysis on the 50 largest MSAs.

While these data sources are powerful, they also have limitations. For example, some states give local governments state funds for small projects in exchange for the local "share" of federal funds so that the local governments can avoid the federal review process; such projects do not appear in the database. Another issue is identifying the point in time when projects are completed based on the FMIS database. While transportation funds are often tracked by obligation date, i.e. the point in time when the project funds are encumbered, long construction times can mean that projects are actually completed years later. In addition, highway projects often include bicycle and pedestrian improvements that are not separately reported in the database.

Chapters 2 and 3: Sacramento and Baltimore: Case studies in spending decisions

Case study selection

This portion of the project began with the identification of regions that had conducted household travel surveys in different years, a necessary prerequisite for the analysis that appears in chapter 4. The University of Minnesota, funded by USDOT's Bureau of Transportation Statistics, has developed a Metropolitan Travel Survey Archive to store, preserve, and make publicly available, via the Internet, travel surveys conducted by metropolitan areas, states and localities. This is a great resource,

which we tapped for this study. We also contacted leading metropolitan planning organizations in an effort to create a more complete archive of our own. The results are shown in Table A-1. Ten metropolitan areas have: (1) conducted surveys for multiple years, several years apart; (2) included walking and biking as mode choices in their travel diaries; (3) provided geocodes for origins and destinations; and (4) made the travel databases available to the public.

Organization	**Region**	**Travel Survey Data Years**
Atlanta Regional Commission	Atlanta, Georgia	1991, 2001
Baltimore Metropolitan Council	Baltimore, MD	1993, 2001
SE Michigan Council of Governments	Detroit, MI	1994, 2005
Metropolitan Council of the Twin Cities	Minneapolis-St. Paul, MN	1990, 2000
Puget Sound Regional Council	Seattle, WA	1990, 1996, 2002
Metropolitan Transportation Commission	San Francisco/Oakland, CA	1996, 2000
San Diego Association of Governments	San Diego, CA	1986, 1995, 2006
Sacramento Council of Governments	Sacramento, CA	1991, 2000
East-West Gateway Coordinating Council	St. Louis, MO	1990, 2002
Florida Department of Transportation	Ft. Lauderdale, FL	1997, 2001

Table A-1. Regional Travel Survey Datasets for Multiple Years

Baltimore and Sacramento were selected as case study regions for various reasons. First, their spending of federal funds for pedestrian and bicycle facilities differed substantially. Analysis of data from the Federal Management Information System (FMIS) shows that the Sacramento region was 15th in the U.S. at $0.95 in federal spending on pedestrian and bicycle projects per capita per year, while the

Baltimore region was 27th, at $0.59 per capita per year. These values include funding from the Transportation Enhancements Program (TE), the Surface Transportation Program (STP), and the Congestion Mitigation and Air Quality Improvement Program (CMAQ).

Second, two large, high quality household travel surveys had been conducted in each region with the "right" time period between them (see Table A-2). The time period had to be a long enough for significant investments in pedestrian and bicycle facilities to occur, and hence changes in travel to occur, but not so long that travel choices would be greatly affected by confounding influences. Baltimore's surveys were spaced eight years apart (1993 and 2001) and Sacramento's spaced nine years apart (1991 and 2000).

Location	Area Covered	Year	Records	Zone Structure
Baltimore	Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties and Baltimore City	1993	2,692 HH 6,533 People 4,331 Vehicles 26,398 Trips	All trips are geocoded to 1998 TAZ structure.
	Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties and Baltimore City	2001	3,519 HH 7,825 People 5,639 Vehicles 27,366 Trips	All trips are geocoded to 2000 TAZ structure.
Sacramento	El Dorado, Placer, Sacramento, and Yolo, Counties	1991	3,724 HH 8,224 People 40,626 Trips	SACOG 1990 Minor Zones and Regional Analysis Districts recorded for origins and destinations

	El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties and Outside Study Area	2000	3,942 HH 9,132 People 5,853 Vehicles 33,954 Trips	Address geocoded for city, county, TAZ, and area type (urban, suburban, exurban, rural)

Table A-2. Baltimore and Sacramento Surveys

The third reason for selecting Baltimore and Sacramento was the study team is represented in Baltimore region at the University of Maryland, and in the Sacramento region at UC Davis. This facilitated interaction with the respective metropolitan planning organizations (the sources of all data).

Case Study Methodology

The regional case studies drew on a variety of sources to identify policies and programs, documenting the role of state policies and local initiatives, and assessing the degree to which bike/ped concerns are institutionalized in the regional planning process. Two primary categories of sources were used: available documents, such as plans, funding programs, and adopted policies; and interviews with key informants, including MPO staff, state DOT officials, local government officials, bike/ped coordinators, and bicycle and pedestrian advocacy groups.

Following a standard protocol for the case studies, we identified policies that have influenced spending patterns, including goals related to pedestrians and bicycles in regional transportation plans, complete streets policies, bicycle and pedestrian plans, Transportation Enhancements selection procedures, and innovative financing techniques. We also characterized the state policy context, i.e. “top-down” effects, as well as local plans and programs, i.e. “bottom-up” effects. We

analyzed the degree to which bike/ped concerns have been institutionalized in the regional planning process, through such mechanisms as performance measures, travel demand forecasting models, project selection criteria, and committee structures.

Chapter 4: Impact on behavior

Study design and methods

We used a quasi-experimental and longitudinal study design, as called for by the physical activity research community. To quote the National Academies of Science report, *Does the Built Environment Influence Physical Activity? Examining the Evidence* (2005), "Various possible research designs that can lay the foundation for treating the complexities of cause-and-effect relationships … include longitudinal studies using time-series data, case-control cross-sectional studies, and other natural experiments."

This study took advantage of "natural experiments" that occur routinely as metropolitan areas build pedestrian and bicycle infrastructure. For each metropolitan region, the availability of regional household travel surveys for two different years allowed us to study changes in walking and bicycling for subareas known as "minor zones" in Sacramento and "traffic analysis zones" in Baltimore. Changes in walking and bicycling were related to expenditures on pedestrian and bicycle infrastructure between the two survey years. The construction of such facilities constitutes the "treatment" in this natural experiment. Other changes that occurred at the zone level between the two years were controlled statistically in this quasi-experimental design.

Data and Measures

The respective MPOs, the Baltimore Metropolitan Council (BMC) and Sacramento Area Council of Governments (SACOG) supplied all data. The data were of four types: socioeconomic data, land use data, household travel data, and bike-ped expenditure data.

Socioeconomic data were available by zone from the MPOs. We were limited to variables that were available for both surveys within each region. In our analysis, we used median household income. To characterize land use in the zone, we calculated activity density as the sum of population and employment divided by land area in acres. Changes in both variables were calculated for use in the models, as described below.

To obtain walk and bike trip frequencies by zone, individual trip records for the travel surveys were aggregated to the zone level. Because zones are often split as regions grow, and seldom merged, the zone structure in the earlier survey year was adopted as the unit of analysis. Zone correspondence tables, supplied by the MPOs, were used to translate from later year to earlier year zone structures. Note that travel diary surveys were originally designed to collect data on vehicle trips and are widely believed to miss many non-motorized trips, particularly those for recreational purposes. The counts used in this study are likely to include primarily utilitarian trips and to underestimate actual trips. However, as long as the methodology for identifying such trips was the same for the two surveys used within each region, the change in counts should provide a good estimate of the trend in walking and bicycling.

Operationalizing bicycle and pedestrian investments by zone proved considerably more challenging than we anticipated. We were not able to locate a readily available list of completed bicycle and pedestrian projects in either region. Instead, we relied primarily on the federally required Transportation Improvement Programs for the regions. It is important to note that this source lists programmed projects rather than completed projects, leaving open the possibility of inaccuracies in the actual year in which the project was completed and at what cost. In addition, projects were not of a common type or always neatly classifiable, and descriptions of projects and their locations were often vague. In many cases, descriptions of highway projects included sidewalk improvements or bicycle lanes, but it was not possible to separate out the portion of the project cost related to these facilities.

The database of bicycle and pedestrian projects for the Baltimore region from 1993 to 2001 was compiled from the Maryland transportation improvement programs (TIPs) for the period. The database for the SACOG region from 1991 to 2000 was compiled from the adopted metropolitan TIP for the period, supplemented by the long-range transportation plans, lists for the transportation enhancements program from a national database, and a SACOG database of bicycle and pedestrian projects. Projects whose descriptions included bicycle or pedestrian facilities were included in the database. Efforts were made to eliminate duplicate projects in cases where a project was delayed from one year to the next in subsequent TIPs or where the same project was listed in multiple sources. Large roadway projects that included a small bicycle or pedestrian component were excluded from the database unless the cost of the bicycle or pedestrian portion was separately reported. Project

costs recorded in the database include all sources of funding, not just federal funding.

In order to assign projects to zones, the projects were manually geocoded in ArcGIS based on project descriptions. All Baltimore projects were either geocoded as lines covering the full extent of the project, or were divided proportionally by area between the zones falling predominantly within the city. In Sacramento, where sufficient information was available, projects were geocoded as lines, e.g., the full extent of a bicycle lane from its starting to ending point. Otherwise, projects were geocoded as points. For projects that could not be assigned a precise location (e.g., the description listed only a city or "various locations"), the total cost of the project was divided proportionally by area between all of the zones within the city. The zones did not always coincide exactly with the city limits, so only the ones that had their centroids (geographical centers) within the city limits were used. Several projects were not place-specific (e.g. funding for bicycle coordinators) and were not included in the analysis.

For both regions, buffer areas of ¼ and ½ mile were calculated for all of the geocoded projects. These buffer areas were then intersected with the zones to produce polygons, which represented the area of overlap between the buffer for each project and the area of the zone. Project costs were prorated by zone according to the proportion of zone area falling within the buffer. Project costs thus obtained were summed over all projects constructed between survey years to yield total spending for each zone.

Models

Walk and bike trips were modeled separately, as these modes are known to differ in the factors influencing their use. We structured the models to test for the effect of investments in pedestrian and bicycle infrastructure on bicycle and pedestrian trips while controlling for other changes in the zone. As a baseline, we incorporated the expected number of trips if nothing other than population and employment in the zone changed between years. We also included changes in household income and changes in activity density in the zone into the model to control for their effects on walking and bicycling. Finally, expenditures on pedestrian or bicycle infrastructure in the zone are included in the model to test the hypothesis that the number of walk and bike trips would increase in response to these investments. In mathematical notation, our models assumed the form:

$$COUNT_i = f (EXPCOUNT_i, \$TRAILS_i, \$SIDEWALKS_i, \$STREETSCAPES, \$LANES_i, \Delta INCOME_i, \Delta DENSITY_i)$$

$COUNT_i$ is the actual number of walk or bike trips to zone i in the later survey year. $EXPCOUNT_i$ is the expected number of walk or bike trips to zone i, computed as the number of sampled trips to the zone in the later survey year multiplied by the proportion of walk or bike trips to the zone in the earlier survey year. This is the count one would expect in the later year if nothing changed between the survey years.

However, certain things did change between the survey years, including the extent of pedestrian and bicycle infrastructure available to zone residents. As noted above, spending variables were estimated for ¼- and ½-mile buffers around

pedestrian and bicycle facilities constructed between the survey years. Spending on trails ($\$TRAILS_i$), sidewalks ($\$SIDEWALKS_i$), and streetscapes ($\$STREETS) were tested in the models for Baltimore, while spending on trails ($\$TRAILS_i$), sidewalks ($\$SIDEWALKS), and bike lanes ($LANES_i$) were tested in the models for Sacramento. Note that Baltimore had streetscape projects but not bike lane projects, while Sacramento had the reverse, as discussed below.

Also changing between survey years were socioeconomic and land use characteristics of zones. These were operationalized with the variables $\Delta INCOME_i$, the change in median household income for the zone, and $\Delta DENSITY_i$, the change in activity density within the zone. Most zones grew in population and employment, and hence became denser and more urban. Many experienced changes in relative household income. We were limited to these control variables by the need for consistent data across survey years and metropolitan regions.

We hypothesized that the number of walk or bike trips in the later survey year would rise with the *expected* number of walk or bike trips (based on mode shares in earlier survey years). We also hypothesized that increases in income would reduce walk or bike trips but that an increase in activity density would have a positive effect on the number of walk or bike trips. Finally, we hypothesized that expenditures on pedestrian or bicycle infrastructure in the zone would be associated with an increase in the number of walk and bike trips over expected levels.

Analysis Method

Our method of analysis was dictated by the distributions of dependent variables. Whether expressed as counts or mode shares, the distributions were highly skewed

toward zero. That is to say, many zones produced no walk or bike trips, or small numbers of walk or bike trips, although a few zones produced large numbers. To illustrate, frequency distributions of walk and bike trips from the later Sacramento survey are presented in Figures 1 and 2. Counts range from 0 to 56 for walking, and 0 to 112 for bicycling. The assumptions of ordinary least squares (OLS) regression are not met in such cases. Specifically, the error term will be neither homoscedastic nor normally distributed.

Figure A-1. Number of Walk Trips by Zone (Sacramento in 2000)

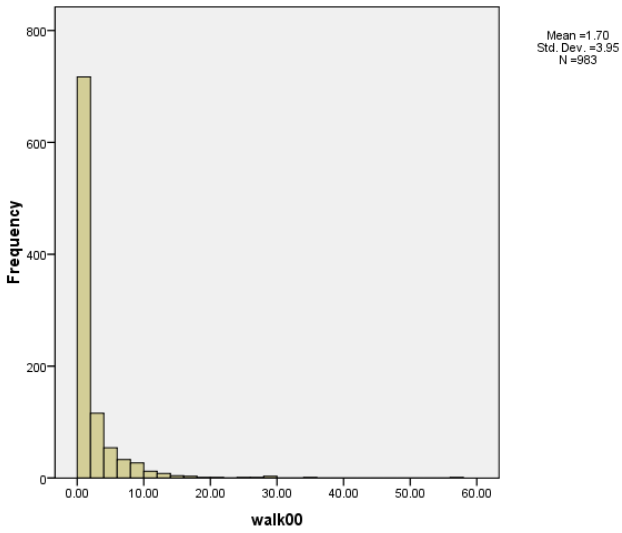
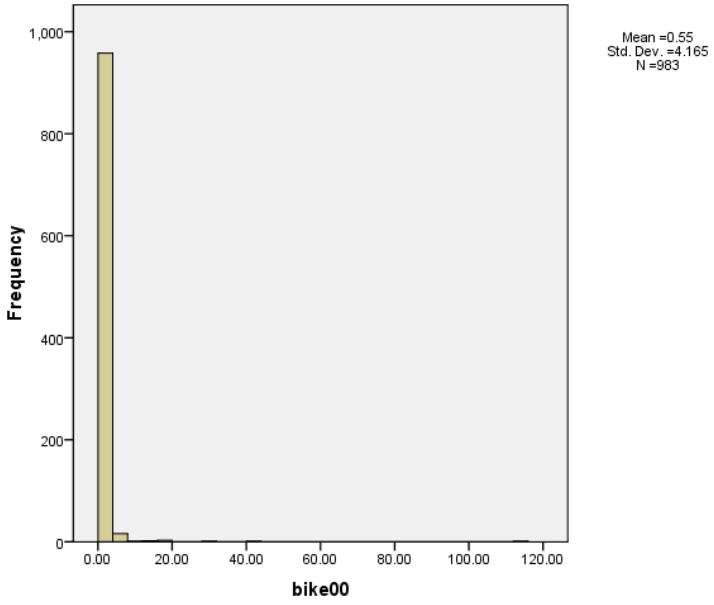


Figure A-2. Number of Bike Trips by Zone (Sacramento in 2000)



Both Poisson and negative binomial regression can be used to model counts when the dependent variable is skewed as in Figures 1 and 2. Both models use the natural log of counts as their dependent variable. However, they differ in their assumptions about the distribution of the dependent variable. Poisson regression is the appropriate model form if the mean and the variance of the dependent variable are equal. Negative binomial regression is appropriate if the dependent variable is over-dispersed, meaning that the variance of counts in greater than the mean. Because the negative binomial distribution contains an extra parameter, it is a robust alternative to the Poisson model. The distributions in Figures 1 and 2 have an excess number of zero values and variances larger than their means. This makes the negative binomial model more appropriate than the Poisson model.

Several models were estimated for each mode in each metropolitan area. Some used spending data for ¼ mile buffers, others for ½ mile buffers. Some used

data for all zones, others only for zones with respectable sample sizes (20+ trips in both years). Some used data for zones with expenditures within their sphere, while others used data for all zones, with or without expenditures nearby. Final model results are presented in Tables A-3 through A-6.

Results Tables

	¼ mile buffer			½ mile buffer		
	coeff	std. error	prob	coeff	std. error	prob
constant	0.213	0.0675	.002	0.198	0.0682	.004
EXPCOUNT	0.115	0.00625	< .001	0.114	0.00643	< .001
∆DENSITY	0.0021	0.0021	.317	0.0022	0.0021	.293
∆INCOME	-7.92E-6	3.84E-6	.039	-7.68E-6	3.87E-6	.047
$TRAILS	6.68E-8	2.73E-7	.807	1.21E-7	1.33E-7	.364
$SIDEWALKS	-4.66E-6	3.89E-6	.231	-1.91E-6	2.00E-6	.339
$STREETS	3.75E-7	2.09E-7	.073	2.43E-7	1.04E-7	.020
pseudo-R^2	0.23			0.23		

Table A-3. Coefficient Values and Probabilities for Walk Trips in Baltimore (¼ and ½ mile buffers)

	¼ mile buffer			½ mile buffer		
	coeff	std. error	prob	coeff	std. error	prob
constant	-2.01	0.140	< .001	-2.01	0.141	< .001
EXPCOUNT	0.320	0.154	.037	0.316	0.153	.038
∆DENSITY	-0.005	0.0074	.508	-0.005	0.0073	.484
∆INCOME	-8.94E-6	8.87E-6	.313	-9.21E-6	8.90E-6	.301
$TRAILS	8.65E-7	3.89E-7	.026	4.96E-7	1.92E-7	.010
$STREETS	-7.79E-6	4.95E-6	.115	-2.76E-6	1.51E-6	.068
pseudo-R^2	0.02			0.03		

Table A-4. Coefficient Values and Probabilities for Bike Trips in Baltimore (¼ and ½ mile buffers)

	¼ mile buffer			½ mile buffer		
	coeff	std. error	prob	coeff	std. error	prob
constant	-0.171	0.096	.075	-0.173	0.097	.074
EXPCOUNT	0.162	0.010	< .001	0.161	0.010	< .001
ΔDENSITY	6.49E-6	1.45E-5	.655	6.41E-6	1.45E-5	.659
ΔINCOME	-1.03E-5	5.62E-6	.068	-1.04E-5	5.61E-6	.064
$TRAILS	2.17E-7	1.75E-7	.215	1.46E-7	8.98E-8	.110
$SIDEWALKS	-1.06E-5	8.70E-6	.222	-1.03E-5	7.08E-6	.146
pseudo-R^2	0.16			0.16		

Table A-5. Coefficient Values and Probabilities for Walk Trips in Sacramento (¼ and ½ mile buffers)

	¼ mile buffer			½ mile buffer		
	coeff	std. error	prob	coeff	std. error	prob
constant	-1.272	0.128	< .001	-1.273	0.129	< .001
EXPCOUNT	0.143	0.012	< .001	0.146	0.012	< .001
ΔDENSITY	3.03E-5	1.53E-5	.031	3.23E-5	1.53E-5	.035
ΔINCOME	-1.60E-5	8.46E-6	.059	-1.63E-5	8.48E-6	.055
$TRAILS	-3.50E-7	3.40E-7	.304	-1.16E-7	1.57E-7	.458
$LANES	2.08E-6	1.17E-6	.075	8.41E-7	5.34E-7	.115
pseudo-R^2	0.34			0.34		

Table A-6. Coefficient Values and Probabilities for Bike Trips in Sacramento (¼ and ½ mile buffers)

APPENDIX B

SACOG Case Study

Analysis of Bicycle and Pedestrian Treatment in the Sacramento Region

Emily Meharg
Kate Wright
Susan Handy

Department of Environmental Science and Policy
University of California, Davis

December 2008

Appendix B: SACOG Case Study

1. SACOG Background

The Sacramento Area Council of Governments (SACOG) is the federally required Metropolitan Planning Organization (MPO) for the Sacramento region, as well as the state required Regional Transportation Planning Agency (RTPA). The SACOG region encompasses six counties (El Dorado, Placer, Sacramento, Sutter, Yolo and Yuba) and 22 cities (Figure B-1). In 2007, the total population of the SACOG region was 2,288,282 and, of that, over half resided in Sacramento County (Figure B-2). The SACOG region is expected to grow substantially in the next 30 years with a six-county population estimate of 3,595,499 by 2040.

Figure B-1. The SACOG Region
Source: SACOG website

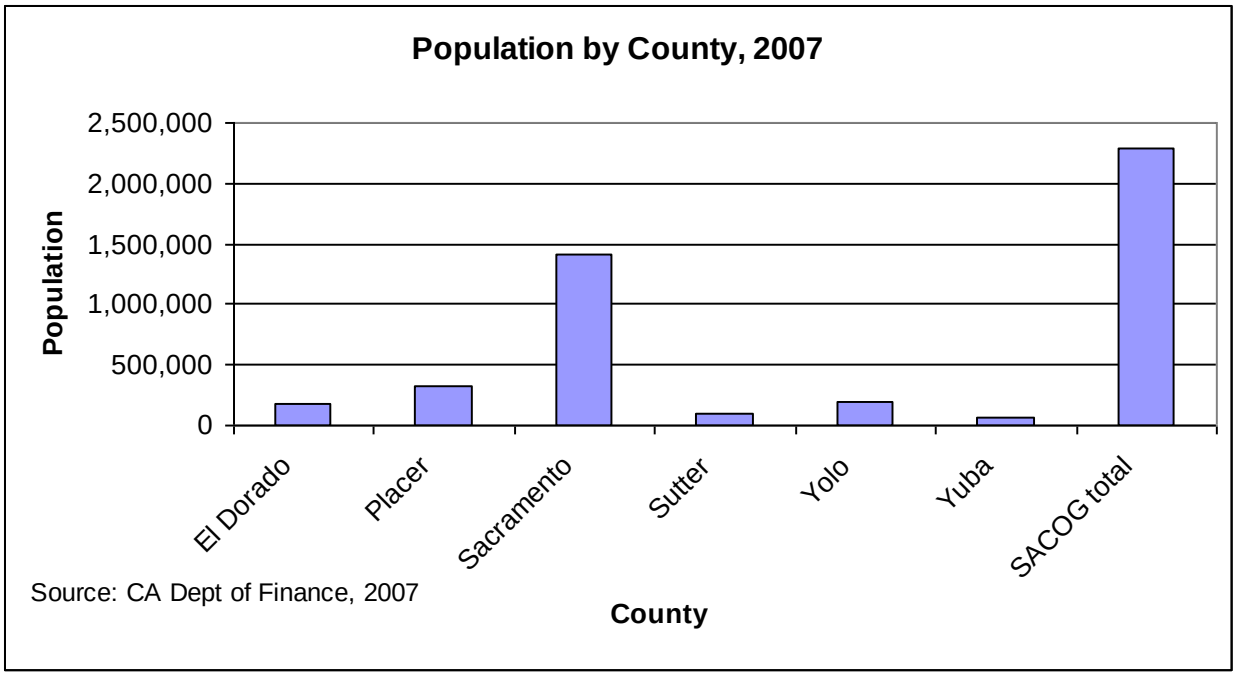


Figure B-2. SACOG county populations, 2007

Located in the Central Valley of California, the region has relatively mild weather throughout the year and much of the region has flat terrain, making it well suited for active travel. Indeed, the region's record on bicycle and pedestrian investments puts it above average for the United States. The Sacramento Metropolitan region programmed $29 million of federal funding in pedestrian and bicycle projects between 1992 and 2006, totaling $0.95 per capita per year (Bailey, 2008). For comparison, the average spending per capita per year between 1992 and 2006 for major metropolitan regions with populations over one million was $0.78. Sacramento has 2.8 miles of bicycle facilities per square mile and 3.1 miles of planned bike and pedestrian facilities per square mile, versus 1.2 and 2.5 miles on average for major cities (Thunderhead Alliance, 2007). In a national comparison of 42 cities made in 2000, the City of Sacramento had the highest density of bicycle

lanes and multi-use paths (Dill & Carr, 2003). The City of Davis, located in Yolo County to the west of Sacramento, has a forty-year history of bicycle planning and was the first city in the nation to be designated a platinum-level bicycle-friendly city by the League of American Bicyclists (Buehler & Handy, 2007).

As a whole, the SACOG region has a higher average percentage of people bicycling to work than the U.S. (Figure B-3). This was true in both 1990 and 2000, although the difference is smaller in 2000 than it was in 1990. Breaking it down by county helps further elucidate the differences. In 1990, El Dorado and Placer counties had the lowest share of bicycling to work and were comparable to U.S. levels; Yuba, Sutter and Sacramento counties were over twice the U.S. average; and Yolo County had the highest share of bicycling to work by far. In 2000, El Dorado, Placer, Sutter and Yuba counties were all fairly comparable to U.S. levels; Sacramento County had a little over twice the U.S. average; and, again, Yolo County had by far the highest percentage of people biking to work.

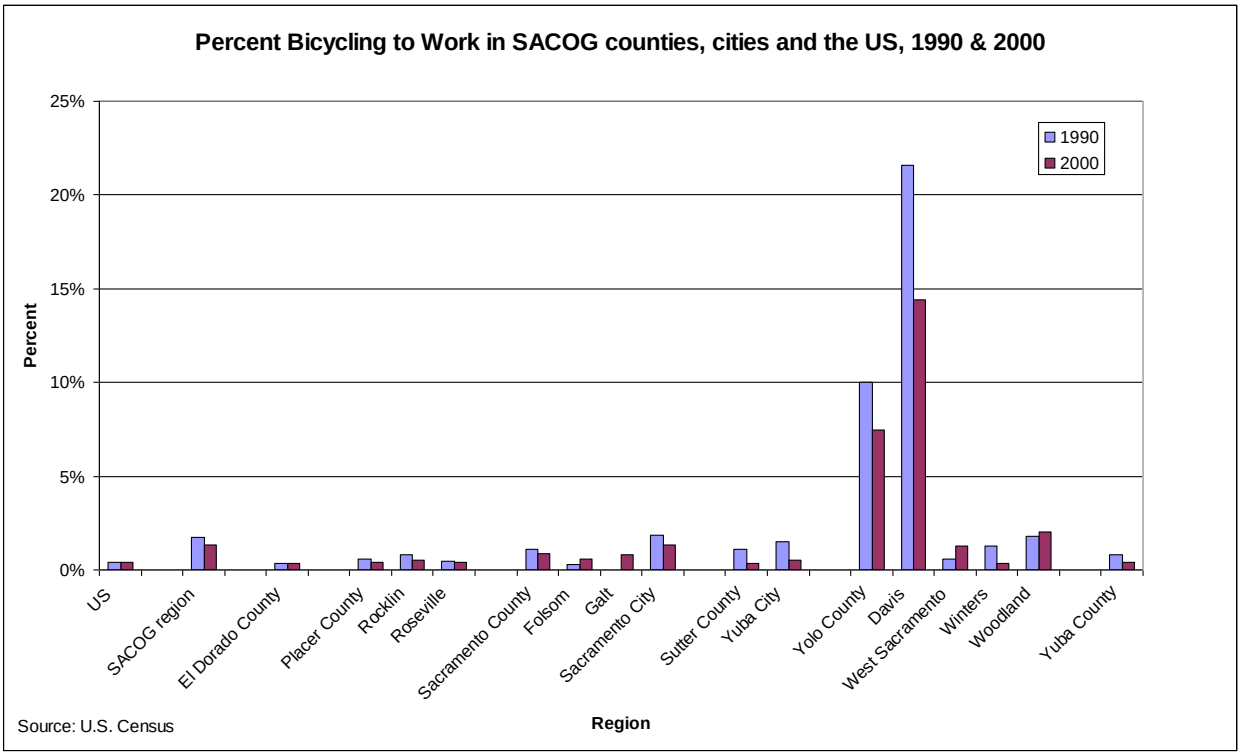


Figure B-3. Percent Bicycling to Work in the U.S. and SACOG counties & cities, 1990 & 2000

Source: US Census, 1990; US Census, 2000b

In contrast, the SACOG region has a lower percentage of people walking to work than the U.S. (Figure B-4). Again, this was true for both 1990 and 2000. In both years, only Yolo County had a higher average than the U.S., mostly due to the high number of pedestrian commuters in Davis and the relatively high percentage of pedestrian commuters in Winters.

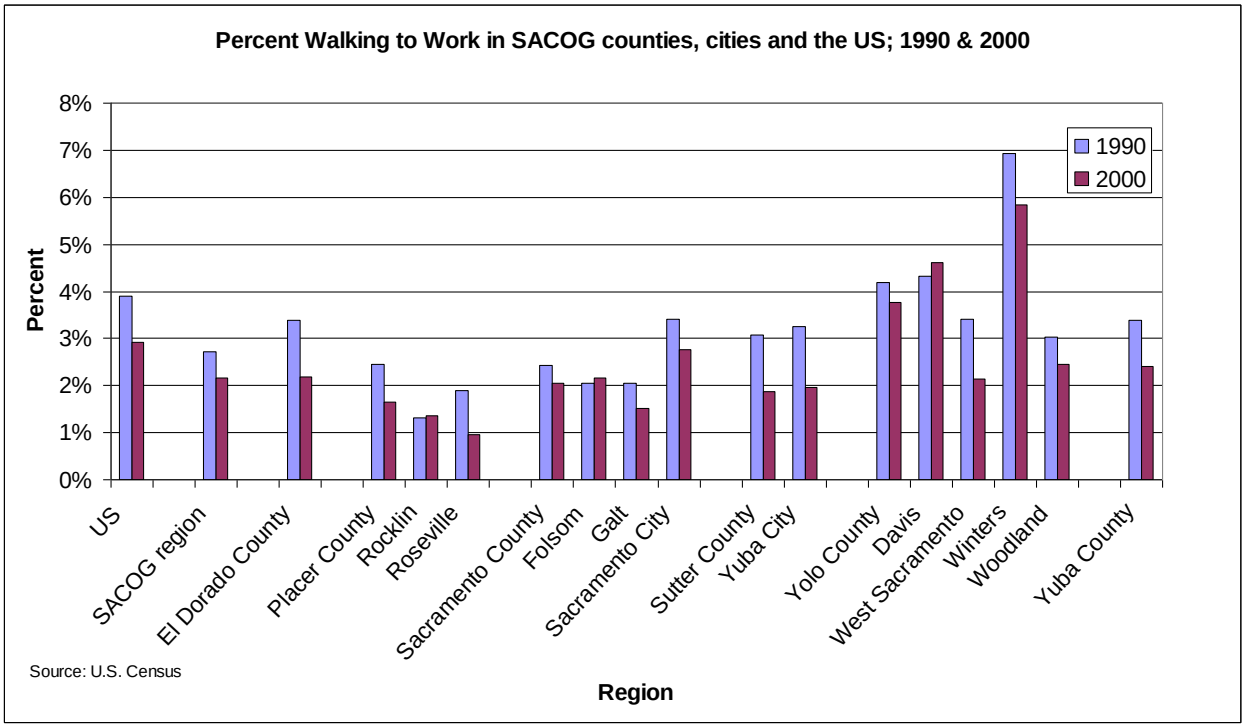


Figure B-4. Percent Walking to Work in the U.S. and SACOG counties & cities, 1990 & 2000

Source: US Census, 1990; US Census, 2000b

2. State context

State Bicycle and Pedestrian Program

As early as the 1970s, California had a bicycle program in place. Housed in the California State Department of Transportation (Caltrans), the program had over 20 staff positions, with bicycle coordinators for each district as well as six to eight employees at the Office of Bicycle Facilities at the Caltrans headquarters. However, in the early 1980s, a majority of the bicycle program was eliminated, including the district coordinator positions. The bicycle program was reestablished as the Office of Bicycle Facilities in 1990 under then director Robert Best. Currently, Caltrans headquarters employs four bicycle and pedestrian staff under its Bicycle and Pedestrian Program. In addition, each of the 12 Caltrans districts has its own bicycle

and pedestrian coordinator, although only three are full time, fully funded positions. The coordinators' main roles are to monitor the bike portions of Caltrans projects and to respond to advocacy group or individual concerns related to bicycling, and some participate in state-level activities (K. McGuire, personal communication, August 4, 2008).

The California Bicycle Advisory Committee (CBAC) plays an important role in overseeing the state program. CBAC was formed by Caltrans in 1992 and consists of 13 members and is supported by staff from the Bicycle Facilities Unit at Caltrans. In addition to select district bicycle coordinators, members of the committee include representatives from the Division of Highway, the California Association of Bicycle Organizations, the League of California Cities and other similar organizations. It should be noted that CBAC, as do many Caltrans committees, has a health agency representative, usually from the Department of Public Health. The main purpose of CBAC is to advise Caltrans on bicycle issues such as signals, signage, lane striping, geometric design standards and policies concerning bicycles (K. McGuire, personal communication, August 4, 2008).

Caltrans is in the process of recognizing the California Pedestrian Advisory Committee (CalPed) as an official advisory committee to the department. First formed in 1998 as the Caltrans Pedestrian Safety Task Force, CalPed consists of representatives from California Walks, the California DMV, the California Department of Public Health, the Governor's Office of Traffic Safety, California Council of the Blind and similar organizations. Representatives from the Federal Highway Administration and Caltrans serve as support staff. According to an

unpublished document provided by Ken McGuire, Chief of the Bicycle Facilities Unit of the Division of Local Assistance at Caltrans, goals of the committee include to

> increase walking, decrease pedestrian fatalities and injuries; support pedestrian mobility by assisting with development of best practices for land use, economic growth, environmental stewardship and transportation infrastructure; facilitate pedestrian travel for the mobility challenged; advise Caltrans and other government agencies on pedestrian issues; [and] represent the pedestrian community in special projects such as implementation of the Strategic Highway Safety Plan (California Pedestrian Advisory Committee Charter, July 31 2008).

Funding Programs

Federal

California uses Transportation Enhancement (TE), Congestion Mitigation and Air Quality (CMAQ) and Safe Routes to School (SRTS) funds for bicycle and pedestrian projects. Both TE and CMAQ funds are sub-allocated to the MPOs.

A major source of federal funding for bicycle and pedestrian projects is the Transportation Enhancement (TE) program. California receives around $70 million in TE funding per year and, according to Ken McGuire (personal communication, August 4, 2008), roughly half goes to bicycle and pedestrian projects. A majority (75%) of this funding is programmed through the Regional Transportation Planning Agencies[5] as a part of the Regional Transportation Improvement Program (RTIP). For the RTIP, each county is allocated a target amount of TE funds as based on population and road miles in the county (McKim, 2007). Project selection is up to the RTPAs, and, generally, an appointed committee prioritizes submitted applications. The Caltrans TE Coordinator must make an eligibility determination for each project.

[5] Regional Transportation Planning Agencies (RTPA) are required by California law. In most cases, the federally designated MPO serves as the RTPA for that area. In the Sacramento region, SACOG is the RTPA for Sacramento, Sutter, Yolo, and Yuba Counties; Placer and El Dorado Counties retain RTPA status up to the crest of the Sierras; the Lake Tahoe basin is in a separate RTPA.

By federal law, TE funds may only be used for 12 specific activities, three of which relate directly to bicycle and pedestrian travel: provision of facilities for pedestrians and bicycles, provision of safety and educational activities for pedestrians and bicycles, and preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails) (California DOT, 2007).

The remaining 25% of projects are nominated by the 12 Caltrans districts and are programmed into the Interregional Transportation Improvement Program (ITIP). For the ITIP, only Caltrans and other state and federal agencies can apply. Bicycle projects in the ITIP are limited to getting bikes off state highways and providing bike access to national and state parks and multi-modal transportation facilities (J. Haynes, personal communication, August 6, 2008; CTC, 2003). Once determined eligible, projects are rated for both statewide significance and project merit by a five-person committee. A prioritized list of projects is created and projects are funded according to the total amount of state TE funding received. The California Transportation Commission (CTC) has the final say in terms of project funding. Both the RTIP and the ITIP become part of the State Transportation Improvement Program (STIP).

Caltrans is also responsible for administering the federal Safe Routes to School (SRTS) program. The federal program was modeled after California's state program, described below, and aims: "1) to enable and encourage children in kindergarten through eighth grade (K-8), including children with disabilities, to safely walk and bicycle to school, 2) to make walking and bicycling to school a more appealing mode choice, and 3) to facilitate the planning, design, and implementation

of projects that will improve safety, environment, and overall quality of life" (Division of Local Assistance of Caltrans, 2008, p.24-1). State, local and regional agencies, as well as non-profits, school districts and Native American tribes may apply for SRTS funding for both infrastructure and non-infrastructure projects (SRTS, 2008). Applications are evaluated by a committee in each of the 12 districts according to standardized instructions and guidelines provided by the district's Safe Routes to School Coordinator. Caltrans' Division of Local Assistance is responsible for final project approval. In 2008, California received $18 million in SRTS funds (Safe Routes, 2008).

State

In 1972, California passed legislation to create the Bicycle Lane Account (BLA), the main purpose of which is to provide "state funds for city and county project (Division of Local Assistance of Caltrans, 2009). From its first funding cycle in 1973 until 1997, the BLA was funded at $360,000 per year through money from the state's fuel tax (via the State Highway Users Tax Account). Funds were granted to localities (cities and counties) at 90% with a 10% local match. In order to receive funding, localities were required to have a Bicycle Transportation Plan (BTP) in place. Up until 1997, a majority of the localities applying for BLA funding were in rural regions since there was not much money in the account (C. Morfas, personal communication, April 18, 2008). However, in 1997, legislation was passed that gradually increased the BLA allocation from $360,000 up to $5 million by 2004. In 2000, another bill was passed that further increased the allocation to $7.2 million per year from 2000 through 2005 and then $5 million from 2006 onwards. Finally, in 2007, the Streets and Highway

Code mandated that $7.2 million again be allocated starting in 2007. The BLA was renamed the Bicycle Transportation Account (BTA) in 1998 and continues to require that localities have a current BTP in place to qualify for funding. The BTP must be updated every five years in order for a locality to remain eligible for BTA funding. Once awarded funding, a locality has three years to spend it. Typically, the BTA gets applications for five to seven times the funding available (K. McGuire, personal communication, August 4, 2008).

Project selection for the BTA is determined by a committee consisting of Caltrans staff as well as representatives from advocacy groups, the California State Association of Counties, the Rails-to-Trails Conservancy and other such organizations. Funding is roughly allocated with respect to population; however, the committee evaluates projects both in terms of their geographic location and their quality, giving them ratings of excellent, good, fair or poor. Generally only “excellent” projects receive funding; however, occasionally “good” projects will be funded if they are in a district that has received less funding than expected for its population. The director of Caltrans makes final project approval.

California established its own Safe Routes to School (SR2S) program in 1999 following the passage of AB 1475, the first such statewide program in the country. Administered by Caltrans, in consultation with the California Highway Patrol, the SR2S program is currently in its eighth funding cycle with $24 million in state funds available (SRTSNP, 2009). SR2S requires a 10% local match. Cities, counties and school districts may apply for infrastructure projects by submitting an allocation request letter to the Division of Local Assistance. The Caltrans Headquarters Area

Engineer determines final funding allocations. SR2S funding is to be used for "construction of bicycle and pedestrian safety and traffic calming projects" (CA Streets and Highways Code, 2008).

Under state law, counties can implement a sales tax increase of up to one percent for transportation or other purposes with a two-thirds vote of its citizens. As of 2003, 13 counties had utilized sales tax for multimodal transportation capital projects with an additional three counties and one town imposing sales taxes for road projects and seven counties imposing sales taxes for transit (Goldman & Wachs, 2003). Annual per capita revenues were $59.50, $41.50 and $85.80 respectively (Goldman & Wachs, 2003). These Local Option Sales Taxes have provided substantial funding for bicycle and pedestrian projects. For example, in Sacramento County, Measure A (a one half percent sales tax for transportation first passed in 1988) generated $2.5 million in bike funding between 1993 and 1998 (Payne, 2002). In 2004, a renewal of this sales tax required that projects include routine accommodation of bicycles and pedestrians in all projects (STA, 2004).

State Policy on Facilities

Currently, California does not have a law that requires the construction of bicycle or pedestrian facilities; however, the state does have design guidelines for the construction of such facilities should they be built. The Highway Design Manual contains these design standards for both pedestrian (chapter 100) and bicycle (chapter 1000) facilities. By law, local governments must follow these guidelines in designing bicycle and pedestrian facilities. California was one of the first states to adopt guidelines on bicycle and pedestrian facility design, and national guidelines

were based in large part on California's (K. McGuire, personal communication, August 4, 2008).

Construction of facilities is encouraged by Deputy Directive 64 (DD-64), entitled "Accommodating Non-motorized Travel." DD-64 states, "the department fully considers the needs of non-motorized travelers (including pedestrians, bicyclists and persons with disabilities) in all programming, planning, maintenance, construction, operations, and project development activities and products" (Caltrans, 2001). In October 2008, DD 64 was revised (DD-64-R1) and re-titled "Complete Streets-Integrating the Transportation System". DD-64-R1's stated intent is "to ensure that travelers of all ages and abilities can move safely and efficiently along and across a network of 'complete streets'" (Caltrans, 2008). A Complete Street is defined as "a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit riders, and motorists appropriate to the function and context of the facility" (p. 1, Definitions/Background).

The California Vehicle Code (§21949) further supports pedestrian travel stating that "it is the policy of the State of California that safe and convenient pedestrian travel and access, whether by foot, wheelchair, walker, or stroller, be provided to the residents of the state" (Cal. Vehicle Code, 2008). Finally, Assembly Concurrent Resolution No. 211 (ACR 211), adopted in 2002 and entitled "Integrating walking and biking into transportation infrastructure", aimed to "encourage all cities and counties to implement the policies of the California Department of Transportation Deputy Directive 64 and the United States Department of

Transportation's design guidance document on integrating bicycling and walking when building their transportation infrastructure" (CA Legislature, 2002).

In September 2008, CA passed Assembly Bill 1358, known as the California Complete Streets Act of 2008. The law, which goes into effect January 1, 2011, will require local cities and counties, when updating their General Plans, "to plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways, defined to include motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation" (§ 4(b)(2)(A)). AB 1358 is the first legislation in the country to address Complete Streets at the local level; previous Complete Streets policies only addressed state highways (CBC, 2008).

State Plans

The state influences regional bicycle and pedestrian planning through the federally mandated state transportation plan, the *California Transportation Plan 2025* (written in 2006), and the *California Blueprint for Bicycling and Walking* (written in 2002). Both documents express ambitious goals for bicycling and walking in the state and outline a variety of strategies for achieving these goals. However, they appear to have little effect on bicycle and pedestrian planning at the local level. Few people interviewed for this study (SACOG staff, city bike coordinators, bicycle and pedestrian advocates, etc.) were aware of these documents or had read them. One interviewee remarked, "there is a state bicycle plan?" while another acknowledged, "they have the State Transportation Plan… but I'm just not really aware of it." In reference to the Blueprint, one interviewee said, "I've heard about it. I've never used it."

The *California Transportation Plan 2025* (CTP) mentions bicycling and walking in the context of ensuring a balanced, safe, reliable, affordable and sustainable system of transportation. Bicycling and walking are portrayed as opportunities to improve mobility, reduce demand on the road system, and to improve health and air quality. The plan recognizes many challenges with respect to making bicycling and walking viable options for residents of the state:

- Current land uses
- Variation in the way different demographic groups travel
- Providing transportation for a growing population (expected to increase by 30% by 2025)
- Excise tax on gas not keeping up with inflation
- Insufficient funds to maintain and operate bike facilities
- Serving the rural population (who make up only 8% of the state's population but 94% of the land area)

Strategies to incorporate bicycling into the transportation system as outlined in the plan include increasing connectivity and integrating infrastructure for bicyclists and pedestrians during planning and design phases of projects. Better land use policies including higher density, public transit connections, and mixed use, are also cited as a way to increase bicycling and walking. Other strategies are to provide bicycle and pedestrian education and to incorporate safe, convenient, and connected bicycle and pedestrian facilities in roadway capacity improvements and rehabilitation projects. The plan discusses the need to support objectives laid out in the *California Blueprint for Bicycling and Walking*, described below. Planning resources for bicycle and pedestrian concerns include two state bicycle coordinators

(one in Northern California, the other in Southern California) and advisory groups such as the Pedestrian Safety Task Force.

The *California Blueprint for Bicycling and Walking* (Blueprint) was written in response to the Supplemental Report of the 2001 Budget Act, which required Caltrans "to submit a report addressing 'measurable goals for increasing bicycling and walking within the state, funding of facilities, and a reduction in pedestrian and bicycling injuries and fatalities'" (CA Blueprint, 2002, p. i). According to Ken McGuire (personal communication, July 13, 2007) at Caltrans, the Blueprint requirement resulted from a proposal by James Corless of the Surface Transportation Policy Project and Chris Morfas of the California Bicycle Coalition. The Blueprint views bicycling and walking as viable means of transportation that could provide congestion relief, improve health and air quality, and conserve energy. The Blueprint suggests the following techniques to increase bicycling and walking in California: education in non-motorized transportation (for drivers, bicyclists, and pedestrians), better law enforcement, traffic management strategies, and land use development that encourages bicycle and pedestrian travel. According to the Blueprint, the main condition hindering bicycle and pedestrian travel is concern over safety; California has a high rate of bicycle and pedestrian fatalities compared to other states. The report outlines several principles for promoting non-motorized travel (Table B-1).

Table B-1. Principles for promoting non-motorized travel

Strategy	Description
Traffic Tools	Integrating transit, traffic calming, etc.
Full Consideration	Expand focus from cars
A Balanced Approach	Fully consider all modes
Dual-Purpose Corridors	Safe areas for cars, bicyclists and

	pedestrians
Trails	Develop more non-motorized transportation systems
Short Trips	Convert trips from car use to bicycles
Connectivity	Connect to the rest of the transportation system
Safety	Lowering traffic speeds
Overcoming Barriers	Overcome attitudinal and institutional barriers in transportation planning and design

California is currently preparing its federally required Strategic Highway Safety Plan. The plan is being developed around 16 challenge areas, including one on pedestrian safety and one on bicycle safety. The plan emphasizes engineering strategies for improving safety (K. McGuire, personal communication, August 4, 2008).

3. Bicycle/Pedestrian Considerations in Regional Plans

Consideration given to bicycle and pedestrian modes in the federally required regional transportation plan for the SACOG region changed considerably between the 1990 plan, prior to the passage of ISTEA, and the 2006 plan. In addition, SACOG adopted a separate bicycle and pedestrian master plan in 2004. Currently, SACOG employs one designated bicycle and pedestrian planner. Figure B-5 shows a timeline depicting important dates in bicycle/pedestrian planning in the SACOG region.

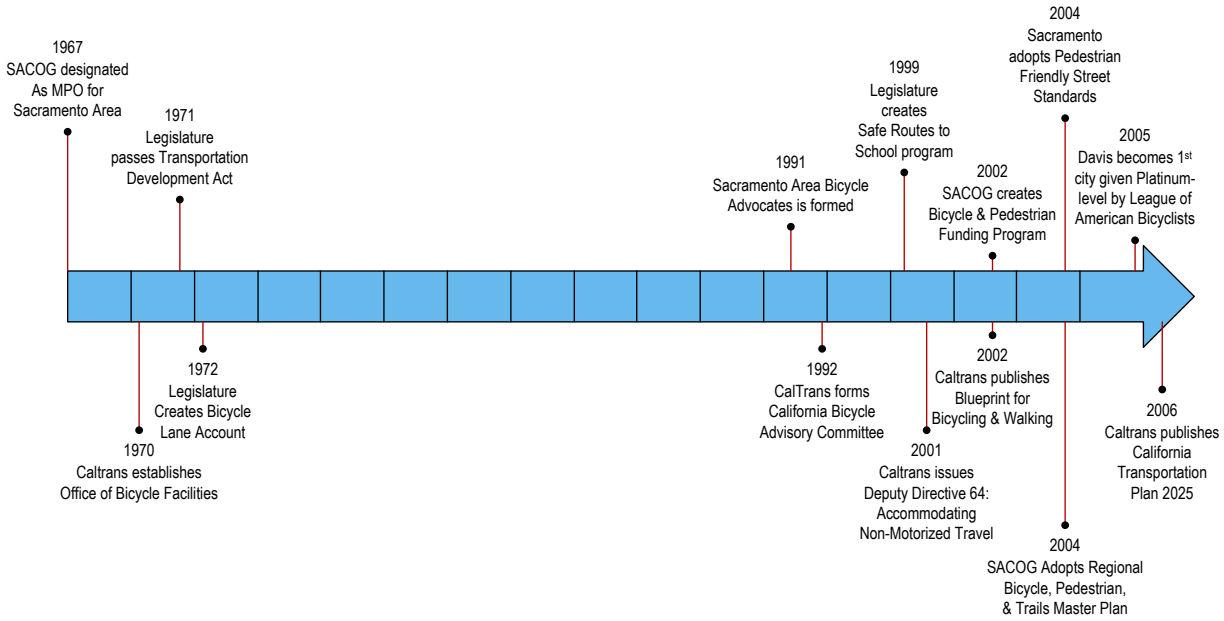


Figure B-5. Timeline of important bicycle and pedestrian activities in the Sacramento region

Regional Transportation Plans

The 1990 Regional Transportation Plan (RTP) noted that three percent of all trips in the region were by bicycle and nine percent by walking. Furthermore, the plan acknowledged, “while these activities have traditionally been recreational pursuits, bicycling and walking are significant parts of the regional transportation mix” (RTP, 1990, p. 90). Issues related to the bicycle and pedestrian network, according to the plan, included lack of safety and convenience, the need for improved infrastructure, limited funding, and a lack of awareness of existing facilities. The plan outlined a range of strategies for encouraging bicycling and walking, including increasing infrastructure, safety measures, and improving access for bicyclists and pedestrians. Projects outlined in the plan included striping, signs, widening and adding lanes, path/trail extensions, sound walls, landscaping, bicycle and pedestrian bridges, and

lighted medians. The plan also encouraged cities to prepare or update their bicycle or pedestrian plans and to work toward a reduction in vehicle-miles-travelled (VMT) through better land use policy.

The 2006 Metropolitan Transportation Plan (MTP) seeks to "develop a fully-integrated, multi-modal transportation system to serve as a catalyst to enhance the quality of life enjoyed by the current and future residents of the Sacramento region" (MTP, 2006, p. 16). The plan shows that the portion of trips taken by bicycle and walking travel has declined since 1990, dropping to six percent of all trips (compared to twelve percent in 1990) (RTP, 1990). This may be due to the extremely rapid growth of auto traffic, which overwhelms bicycle and pedestrian mode share. The plan acknowledges "the Sacramento region, with ideal climate and terrain, could see more travel by bicycling and walking" (MTP, 2006, p. 3). Stated objectives in the plan are to increase the safety and security of bicyclists and pedestrians; to provide for all forms of transportation, including non-motorized; to promote telecommuting, ridesharing, and cleaner forms of transportation; and to accommodate bikes on buses.

The plan envisions "major increases in rail, bus, bicycle and pedestrian facilities" (MTP, 2006, p. 20) and sets a goal of allocating as much as $350 million to regional bicycle and pedestrian projects over the life of the plan. The kinds of projects described in the plan are similar to those in the 1990 plan, but the 2006 plan goes farther in describing supportive programs. Of particular note is the Community Design Funding Program that allocates transportation funding for development projects that "encourage people to walk, bicycle, or ride transit for local travel" (MTP,

2006, p. 4). The program provides for planning grants to local government and funds “transportation improvements that complement ‘smart growth’ projects” in order to "encourage people to make local trips, use public transit, walk and bike” (MTP, 2006, p. 23). This program creates financial incentives for the kind of land use policy change that the 1990 plan encouraged.

While both the 1990 and 2006 plans integrate bicycle and pedestrian considerations into regional transportation planning, the 2006 plan conveys a clearer understanding of the nexus between walking, bicycling, land use, and health. For example, the 2006 plan sets as a goal the improvement of “the health of our residents by developing systems that would encourage walking and biking” (MTP, 2006, p. 17). Overall, the 2006 plan supports public transit, bicycling and walking as favorable alternatives to driving.

Table B-2. Comparison of SACOG’s 1990 RTP and 2006 MTP

	1990	2006
Current Situation	B/p makes up a small percentage of the mode share. Describes b/p facilities and plans within the SACOG region at the city and county level. Explains issues facing the b/p network	Few travel by walking or bicycling; the overwhelming majority drives. Without changes in community design bicycle and pedestrian trips won't change significantly. An increase in bicycling and walking now discouraged in some communities by heavy local auto traffic
Goals & Objectives	To reduce VMT through better land use. Encourage bicycling and walking through increased infrastructure, safety measures, and improving access. Encourage cities to prepare or update b/p plans	To increase the safety and security of b/p. To improve community design (through smart growth principles including infill and redevelopment). To provide for all forms of transportation including non-motorized. To promote telecommuting, ridesharing and cleaner forms of transportation. To accommodate bikes on buses
Projects/ Programs	Describes b/p infrastructure projects such as stripping, signs, widening and adding lanes, path/trail extensions, sound walls, landscaping, b/p bridges, lighting medians.	Describes b/p infrastructure projects such as stripping, signs, widening and adding lanes, multi-modal stations, path/trail extensions, sound walls, landscaping, b/p bridges, lighting medians in addition to programs; Travel Demand Management and Community Design Incentive for funding smart growth projects

Other Bicycle and Pedestrian Plans

In 2004, SACOG adopted the *Regional Bicycle, Pedestrian and Trails Master Plan*, a long-range planning document separate from the RTP dealing specifically with bicycle and pedestrian modes. Creation of the *Regional Bicycle, Pedestrian and Trails Master Plan* was mandated by the *MTP for 2025* and was guided by an advisory committee that consisted of "SACOG staff, representatives from each of the six SACOG member counties, Air Quality Management Districts, Caltrans, and local bicycle and pedestrian advocacy groups" (RBPTMP, 2007, p. ii). The plan has been amended twice since its original adoption in 2004.

Overall, the plan is "oriented toward utilitarian trips and emphasizes regional connectivity and connections to transit systems" (RBPTMP, 2007, p. 7). The plan comprises program goals, criteria for project inclusion, project evaluation criteria, the financial plan for the regional network, design guidelines, metrics for improvement and success, and recreational trails. The master plan "is intended to guide the long-term decisions for the Bicycle and Pedestrian Funding Program" (RBPTMP, 2007, p. ii), described below. The goal of the plan is "to integrate local plans to create a seamless regional bicycle and pedestrian system" (RBPTMP, 2007, p. 2), and projects are prioritized by their contribution to the regional network. The plan emphasizes inter-jurisdictional/interregional connections, access within or through central business districts, access across barriers, reduced travel time and improved convenience, safety and security for utilitarian trips, and aesthetic, pleasant and comfortable conditions for biking and walking.

In the early 2000s, another important planning and policy process in Sacramento was begun, the extensive scenario planning exercise called the

Sacramento Blueprint Land Use and Transportation Study (SACOG & Valley Vision, 2004). In 2004, the community chose a compact development scenario that has helped guide transportation and land use policy.

4. Local Government Role

In addition to state and regional planning, the quality of the bicycle and pedestrian environment depends on local planning. Local governments have control over land use planning and local transportation and are, therefore, integral to establishing a transportation system that includes and encourages bicycling and walking. The state requires that all cities and counties in California have a General Plan, which must include seven required elements, including a circulation element. Mandatory issues in the circulation element include: major thoroughfares, transportation routes, terminals and other local public utilities and facilities. While not mandatory, the state has suggested that cities and counties consider bicycle and pedestrian routes and facilities when addressing the mandatory issues (Governor's OPR, 2003). As noted earlier, AB1358 adds a new requirement that General Plans address the needs of pedestrians and bicyclists as they update their circulation elements. The attention paid to bicycle and pedestrian modes in the current General Plans for each county and city in the SACOG region ranges from limited to significant.

In order to assess the level to which cities and counties are planning for bicycling and walking, we analyzed the content of General Plans within the case study region with respect to these considerations:

- Strategies to encourage bicycling
- Benefits of bicycling and walking mentioned
- Infrastructure for bicyclists and pedestrians

- Connecting land use to non-motorized transportation
- Policies that benefit cyclists and pedestrians

The first step in the analysis was to identify all items covered by the plans within each of these categories (Table B-3).

Table B-3. Categories Used in General Plan Analysis

Benefits	Congestion Mitigation
	Demand Management
	Health
	Air Quality
	Transportation
	Recreation
Strategies	Increase bicycle/pedestrian mode share
	Improve safety
	Improve connectivity
	Provide interesting routes
	Improve convenience
	Serve broad spectrum of modes
	Focus on attractiveness/beautification
	Provide destination-oriented trails
	Encourage Use of non-vehicular transportation modes
	Implement Traffic Calming Measures
	Improve intersections safety and convenience
	Encourage parks/open space that allow/encourage B/P
	Support B/P education
	Provide B/P incentives
	Adopt LOS standard for B/P
	Ongoing program to identify hazardous conditions for B/P
	Develop mechanisms to increase funding
	Address parking as demand management technique
	Improve public transit alternative
Infrastructure	B/P network
	B/P links where cars are prohibited
	B/P infrastructure in new developments
	Good signage to mark B/P crossings
	Continuous trails/paths
	Bicycle parking
	Bicycle racks on buses

Land Use	Transit-oriented design Housing in transit-oriented development
Planning	B/P coordinator Separate B/P plan B/P commission(s)

We then counted the number of items covered in each category for each city. Next, these totals were divided by the total number of items in each category. Cities were then rated high (above 68% of items mentioned), medium (35-67% of items mentioned), low (below 34% of items mentioned), or none for each category. The overall rating for the city was determined based on the total number of items across all categories appearing in the plan divided by the total possible number of items across all categories.

Among the six SACOG counties, Sacramento rated highest with respect to the number of strategies, benefits, infrastructure types, and land use policies related to bicycle and pedestrian modes mentioned in the plan (Table B-4). Among cities, only the General Plans of Davis, Woodland, and Rancho Cordova rated high overall (Table B-5). Many of the smaller, rural cities in the region gave low or no attention to bicycle and pedestrian modes. The year the plan was adopted may affect these patterns; many of the older plans are slated for update in the near future and are expected to give more attention to bicycles and pedestrians than the current plans.

Table B-4. Analysis of Bicycle and Pedestrian Policies in General Plans – SACOG Counties

County	Population*	Year Plan Adopted	Strategies	Benefits	Infrastructure	Land Use	Overall

El Dorado	178,066	2004	Medium	Medium	Medium	Medium	Medium
Placer	326,242	1994	Low	Medium	Low	Medium	Medium
Sacramento	1,374,724	1993	High	High	Low	High	High
Sutter	91,410	1996	Low	Medium	Low	Low	Low
Yolo	188,085	1983	Medium	Low	High	Low	Medium
Yuba	70,396	1994/96	Low	High	Medium	Low	Medium

*****Source: U.S. Census Bureau- most recent year available

Table B-5. Analysis of Bicycle and Pedestrian Policies in General Plans – SACOG Cities

City	Population*	Year Plan Adopted	Strategies	Benefits	Infrastructure	Land Use	Overall
Citrus Heights	88,515	2000	Medium	Low	High	Low	Medium
Davis	64,348	2001	High	Medium	Medium	High	High
Elk Grove	100,760	2003	Medium	High	Low	Low	Medium
Folsom	62,628	1993	Medium	Medium	Medium	Low	Medium
Galt	23,173	1989	Low	None	Low	Medium	Low
Lincoln	11,205	1988	Low	None	Low	Low	Low
Live Oak	6,229	1992	Low	Low	Low	None	Low
Loomis	6,260	2001	Low	Medium	Low	Medium	Low
Marysville	25,315	1985	Low	Low	None	Low	Low
Placerville	9,610	1989	Low	Low	None	High	Low
Rancho Cordova	55,060	2006	High	Medium	Medium	High	High
Rocklin	46,937	2005	Medium	Low	Low	Low	Low
Roseville	98,359	1992	Medium	High	Medium	Medium	Medium
Sacramento	445,335	1998	Medium	High	High	High	Medium
West Sacramento	37,897	1990	Low	Low	Low	High	Medium
Wheatland	2,275	2006	Medium	High	Medium	Medium	Medium
Winters	6,125	1992	Medium	Low	Low	High	Medium
Woodland	50,988	2002	Medium	High	High	High	High
Yuba City	48,998	2004	Medium	Medium	Medium	Low	Medium

*****Source: U.S. Census Bureau- most recent year available
Note: General Plans for the cities of Auburn, Colfax, and Isleton were not available for this analysis

The majority of counties (see Table B-6) and cities (see Table B-7) recognized the benefits of bicycling and walking as both a means of transportation and of recreation. Additionally, most cited bicycling and walking as a way to improve air quality and to manage demand by reducing the need for travel by automobile. Six

cities and three counties recognized bicycling and walking as a congestion mitigation measure. Only one city and two county General Plans cited bicycling and walking as a way to improve health.

Table B-6. Benefits of Bicycling and Walking Recognized in General Plans – SACOG Counties

County	Congestion Mitigation	Demand Management	Health	Air Quality	Transportation	Recreation	Total
El Dorado		√			√	√	3
Placer		√			√	√	3
Sacramento	√	√	√	√	√	√	6
Sutter	√			√	√	√	4
Yolo					√	√	2
Yuba	√	√	√	√	√	√	6
Total	3	4	2	3	6	6	

Table B-7. Benefits of Bicycling and Walking Recognized in General Plans – SACOG Cities

City	Congestion Mitigation	Demand Management	Health	Air Quality	Transportation	Recreation	Total
Citrus Heights					√	√	2
Davis		√			√	√	3
Elk Grove	√	√		√	√	√	5
Folsom				√	√	√	3
Galt							0
Lincoln							0
Live Oak					√		1
Loomis		√		√	√	√	4
Marysville					√	√	2
Placerville					√		1
Rancho Cordova	√			√	√	√	4
Rocklin					√	√	2
Roseville	√	√		√	√	√	5
Sacramento	√		√	√	√	√	5
West Sacramento		√			√		2
Wheatland	√	√		√	√	√	5
Winters		√		√	√		3
Woodland	√	√		√	√	√	5
Yuba City		√		√	√	√	4
Total	6	9	1	10	17	13	

Bicycle and pedestrian planning resources, including a bicycle/pedestrian coordinator, a bicycle/pedestrian commission, and a separate bicycle/pedestrian

plan, also varied significantly across both counties (Table B-8) and cities (Table B-9). All counties had a separate bicycle/pedestrian plan as of 2006, a requirement for applying for state Bicycle Transportation Account funding. Sacramento and El Dorado counties are the only ones in the region with a bicycle/pedestrian coordinator, and Sacramento and Yolo counties are the only ones with bicycle/pedestrian commissions. Very few cities in the region have bicycle/pedestrian coordinators or bicycle/pedestrian commissions (Table B-9), but almost all have separate bicycle and/or pedestrian plans (Rancho Cordova is currently creating both a bicycle and pedestrian plan). While bicycle/pedestrian plans are common across cities and counties, it is possible that the implementation of these plans is hindered by the lack of a designated staff person such as a bicycle/pedestrian coordinator to carry them out.

Table B-8. Bicycle and Pedestrian Planning Resources - SACOG Counties

County	B/P Coordinator	B/P Commission(s)	Separate B/P Plan	Year B/P Plan First Adopted	Year of Most Recent B/P Plan
El Dorado	√		√	1979	2005
Placer			√	1988	2002
Sacramento	√	√	√√	1977	2007
Sutter			√	1995	1995
Yolo		√	√	1974	2006
Yuba			√	1995	1995

Table B-9. Bicycle and Pedestrian Planning Resources - SACOG Cities

City	B/P Coordinator	B/P Commission(s)	Separate B/P Plan	Year B/P Plan First Adopted	Year of Most Recent B/P Plan
Auburn			√	2002	2002
Citrus Heights			√	In progress	
Colfax			√	2003	2003
Davis	√	√	√	1993	2006

Elk Grove			√	2004	2004
Folsom	√		√	2002	2007
Galt			√	2002	2002
Lincoln			√	2001	2001
Live Oak			√	1992	
Loomis			√	2003	2003
Marysville			√	1985	
Placerville			√	2005	2007
Rancho Cordova	√	√	√	In progress	
Rocklin					
Roseville	√		√	1994	2008
Sacramento	√	√	√	1977	1995
West Sacramento			√	1991	1991
Wheatland					
Winters			√	1998	2002
Woodland			√	1993	2003
Yuba City			√	1974	

The City of Davis is widely recognized as a national leader in bicycle planning. The factors behind this success are numerous (Buehler & Handy, 2007), but local development policies, including the general plan and the zoning code, have clearly played a role. In particular, policy requires developers to contribute to bicycle and pedestrian infrastructure, whether by providing new infrastructure directly or by paying fees that support the city's greenbelt network. In addition, the general plan limits roads to no more than four-lanes and dictates that businesses provide bike racks. Although a bicycle/pedestrian plan establishes policy direction, the General Plan provides a mechanism for implementing those policies (T. Bustos, personal communication, September 18, 2007).

Sacramento also has a strong history of innovative planning and incorporating bicycle and pedestrian modes into transportation projects. In 2004, the Sacramento City Council adopted a resolution to approve Pedestrian Friendly Street Standards, stating "The city's street system should encourage alternate mode use, especially walking and bicycling, by working toward a balance of all street users" (Sacramento

City Council, 2004, item 2). The resolution incorporated and earlier resolution (Sacramento City Council, 2003) that had directed staff "to prepare the appropriate changes to the relevant policy documents needed to implement the new street standards and return for final City Council approval" (item 2). In late 2005, a citizen commission completed a Sacramento Complete Streets Best Practices Guide to designing streets for all users in the city (Sacramento Transportation and Air Quality Collaborative, 2005). In Sacramento County, a sales tax measure first passed in 1988 and renewed in 2004 included a requirement that all projects it funds must provide for bicycle and pedestrian travel. More specifically, it specifies, "5% of the sales tax revenues collected shall fund non-motorized, pedestrian and bicycle safety improvements" (STA, 2004, p. 11).

5. Bicycle/Pedestrian Considerations in the Regional Planning Process

Funding

SACOG is responsible for the programming of federal and state transportation funds for four of the six counties (El Dorado and Placer counties do their own programming). The Metropolitan Transportation Plan (MTP) outlines how these transportation funds are expected to be spent. The *MTP for 2025* (adopted in 2002) was based on an expected $22.5 billion in funding over 23 years. Of that, roughly one quarter was allocated "to operate transit services" and another quarter "to maintain streets, roads, and highways"; "the remaining half must be used for improvements" (SACOG, 2002, p. 6-7). Improvement funds were allocated as follows: $2.5 billion (22.7%) for transit improvements, $2.5 billion (22.7%) for state

highway improvements, $4.5 billion (41%) for local street and road improvements and $1.5 billion (13.6%) for other improvements, including bike/ped improvements, community design incentives, travel demand management, clean air, open space and enhancement programs (SACOG, 2002).

SACOG awards transportation funds through various funding programs, but bicycle and pedestrian projects are generally funded through the following six regional programs (which were first outlined in the 2002 MTP and fall under the "other improvements" category): the Bicycle Pedestrian Funding Program (BPFP), the Community Design Funding Program (CDFP), the Air Quality Funding Program, Transportation Demand Management, Regional Scale, and Local (Table B-10). Although any of these programs can fund bike/ped projects, the BPFP is the only one dedicated solely to bike/ped projects; the programming process for this program is described below. Prior to the implementation of these funding programs in 2002, SACOG primarily funded bike/ped projects through TDA and BLA funds (RTP, 1990).

Working groups for each program are responsible for ranking the projects submitted by local jurisdictions. The SACOG Board of Directors then allocates money to each program. Funding amounts outlined in the *MTP for 2025* help guide the allocation decision. The 2025 MTP 23-year funding amounts are as follows: $350 million for Bicycle and Pedestrian, $180 million for Air Quality, $500 million for Community Design, and $44 million for Transportation Demand Management (SACOG, 2002; SACOG, 2007a). Overall, these funding programs account for approximately $1 billion of the $22 billion, 23-year plan. In addition, the *MTP for*

2025 foresees $4.7 billion of the $22 billion to be for regional-scale improvements and $281 million for local bicycle and pedestrian projects (SACOG, 2002). It should be noted that the actual amount of money each program receives varies and is not a fixed amount or percentage each year (J.L. Caceres, personal communication, May 2, 2008), though the priorities laid out in the regional transportation plan are used as a guide (N. Kays, personal communication, August 31, 2007).

The major federal sources that fund these programs are the Congestion Management and Air Quality (CMAQ) program, the Transportation Enhancements (TE) program, and the Regional Surface Transportation Program (RSTP). Therefore, selected projects must qualify for these federal funding sources. In addition, a local match of 11.47% is often required. Minimum project size for capital projects is generally $150,000 (SACOG, 2007a). It should also be noted that SACOG follows the “use it or lose it” policy; any funds not obligated in a timely manner will be taken away by the CTC and reprogrammed (SACOG, 2001).

A majority of SACOG’s bike/ped projects are funded by CMAQ under the BPFP (Caceres, personal communication, May 2, 2008). In 2007, SACOG received $25.2 million in CMAQ funds and expects to receive $26.3 million in 2008. In order to be eligible for CMAQ funds, projects must demonstrate that they will result in a measurable reduction of pollution emissions. Thus, project applicants must include a section on emissions calculations as part of their application for SACOG’s Bicycle and Pedestrian Funding Program. The California Air Resources Board has published a manual titled “Methods to Find the Cost-Effectiveness of Funding Air Quality Projects” that is meant to help applicants estimate cost-effectiveness of

transportation projects, including bicycle and pedestrian facilities. The manual is available as a pdf document or an automated Microsoft Access database program and includes formulas and sample calculations for determining emissions reductions per year. Applicants input factors such as the average length of bicycle trips, the average daily traffic volume on the roadway parallel to the bicycle project, types of activity centers in the vicinity of the bicycle project, and days of use per year and then use the formulas (or Access program) to calculate annual emission reductions in kilograms per day. Default values or maximums are provided for most of the inputs and can be used when data isn't available. Emission factor tables for various vehicle types are also provided for use in calculating annual emissions reductions for reactive organic gases, nitrogen oxides and particulate matter (CARB, 2005).

In addition to the Bicycle and Pedestrian Funding Program (which is dedicated solely to bike/ped projects), the Community Design Funding Program also funds a significant number of bike/ped projects. The CDFP is intended to help communities implement physical development that is consistent with SACOG's long-range Smart Growth plan, know as the Blueprint. Principles in the Blueprint include Transportation Choices, Housing Diversity, Compact Development, Mixed Land Uses, and other factors. The CDFP is divided into three funding categories: Conventional, Complete Streets and $100,000. The purpose of the Complete Streets category is "to provide funding for the transformation of transportation corridors to more pedestrian and transit friendly streetscapes with an associated transition in land uses" (SACOG, 2007c, p. 10). Approximately one to three projects are expected to be funded through the complete streets category of the CDFP in the

2007-09 funding cycle. In contrast to the BPFP and the CDFP, the Regional Scale funding program does not generally fund purely bike/ped projects. Instead, it is mostly used for large roadway projects, which sometimes include a bike/ped component, as was the case in 2007 (Table B-10).

Table B-10. SACOG Funding Programs and Share for Bike/Ped Projects in 2007

	Total	CMAQ Funds	RSTP Funds	Other Sources	Bike/Ped Share
Bicycle Pedestrian Funding Program	11,457,568	11,132,568		325,000	11,457,568
Community Design Funding Program	18,365,000	5,775,000	6,600,000	5,560,000	17,935,000
Air Quality Funding Program	7,156,000	7,156,000			0
Transportation Demand Management	2,200,000	2,200,000			50,000+ *
Regional Scale	61,970,000	11,532,000	29,538,000	20,900,000	2,500,000
Local Scale	2,492,000	282,000	2,210,000		1,150,000

Source: SACOG, Bicycle/Pedestrian Projects funded through the 2007 Funding Program; SACOG, 2008 Bicycle and Pedestrian Funding Recommendations
* At least $50k of the TDM budget goes to “May is Bike Month”; other funding may also go toward promotion of bicycling and walking.

In addition to state and federal funding, local sources play a significant role in funding bike/ped projects. For example, the City of Davis has funded bicycle projects through a variety of local sources including development fees and air district fees (some of which were funded through license tag fees) - “pretty much the whole spectrum, local, state, federal government, as well as private funding,” according to Tim Bustos (personal communication, September 18, 2007), former Bicycle

Coordinator for the city. Indeed, the City of Davis Comprehensive Bicycle Plan (2006, p. 25) states “Bikeways in Davis may be funded from the full range of financial resources available to the city. These resources include the General Fund, Construction Tax, development impact fees, redevelopment monies, Mello-Roos Bonds, and cost participation by other entities… Additionally, bikeway projects may be eligible for State or Federal funding when a bikeway project meets the appropriate program criteria” (p. 25).

Also of note is the Transportation Development Act (TDA). The TDA, passed in 1971, returns one quarter cent of the state’s general sales tax to the county of origin to create a Local Transportation Fund (LTF) in each county. Article 3 of the TDA allows RTPAs to earmark 2% of the LTF for bicycle and pedestrian facilities (Payne, 2002). Between 1993 and 1998, Sacramento County spent $2.7 million in TDA expenditures on bicycle and pedestrian facilities (Payne, 2002). The TDA also creates a State Transit Assistance (STA) fund from spillover gasoline sales tax although the STA fund is for mass transit and not bike/ped (Division of Mass Transit, Caltrans, 2005).

Of the bicycle/pedestrian projects funded through SACOG’s 2007 Funding Program, 49% of the funding was from local, 40% from federal, and 11% from state sources (note: these figures exclude El Dorado and Placer counties as SACOG does not do their programming. If El Dorado and Placer counties are included, the funding breakdown becomes 48% federal, 47% local and 5% state).

Project Selection

The *Regional Bicycle, Pedestrian and Trails Master Plan* (RBPTMP) determines the pool of projects from which SACOG will choose when making funding decisions for the Bicycle and Pedestrian Funding Program. There is not a strict application process to get a project in the RBPTMP; jurisdictions simply have to submit a project and it will be included, provided it is determined to be eligible by SACOG staff. (Because SACOG does not do the programming for El Dorado and Placer counties, those projects are not required to be in the RBPTMP.) The Bicycle and Pedestrian Working Group (BPWG), described below, scores and ranks all bicycle and pedestrian project applications submitted by the jurisdictions within the region. The Board of Directors provides the BPWG with a set funding amount prior to their meeting to guide the BPWG in their recommendations for project prioritization and funding allocation (L. Symons, personal communication, August 6, 2008). Projects are ranked based on a point system to determine whether they are high, medium or low priority. Points are allocated in the following categories: linkage, desirability, implementation, equity, satisfying demand, and safety (Table 11). It should be noted that the point system is not strict and the working group may not use actual points when determining project priorities (L. Symons, personal communication, August 6, 2008). For example, analysis of the awarded projects for the past two funding cycles shows that regional equity was not as high a priority in the 2007/09 cycle as it was in 2005/07. In addition, the criteria tend to prioritize large projects, such as long-distance bike paths that link to other jurisdictions and activity centers, over smaller improvements, such as traffic calming projects, on-street bicycle lanes, "complete streets" designs, safety and educational programs. There is some concern that the

former projects may serve fewer residents of the region than the latter projects (N. Kays, personal communication, August 31, 2007). In general, a project must be ranked as a "high" priority to get funded; however, under special circumstances, "low" and "medium" priority projects, or projects not listed in the RBPTMP, can get funded.

Table 11. Project Scoring Criteria

Category	Criterion	Points
Linkage	To Activity Centers	20
	To Transportation System	12
	Barrier Elimination	15
	To Other Jurisdictions	5
Desirability	Traffic Characteristics	15
	Continuity	8
Implementation	ROW/Environment	10
Equity	Geographic Distribution	5
Satisfy Demand		5
Safety		5

Source: Regional Bicycle, Pedestrian and Trails Master Plan, Appendix C

Once the Bicycle and Pedestrian Working Group has ranked projects they are reviewed by SACOG staff who proceed to make their own recommendations based on funding and geographic locations. The recommendations are also reviewed by SACOG staff and the Transportation Committee to ensure that they are regionally equitable. They are then provided as information to the Regional Planning Partnership and Advisory Committee and presented to the SACOG Board of Directors. Grant cycles for the Bicycle and Pedestrian Funding Program occur approximately every two years and usually happen in parallel with the selection of road projects for the RTIP.

Similar project selection processes occur for the Community Design Funding Program and the Air Quality Funding Program, each of which has its own respective Working Group.

Travel Demand Forecasting Model

SACOG's travel demand forecasting model, used to predict the use of different modes in the future given a proposed transportation system, has included bicycling and walking as separate mode choices in the travel demand-forecasting model for the past 15 years. According to Bruce Griesenbeck (personal communication, 2007), a senior transportation demand modeler at SACOG, the SACMAT model, developed in the early 1990s, incorporates a Pedestrian Environment Factor for each zone into the mode choice model. The SACSIM model is currently under development and is expected to replace the SACMAT model in 2009. This model is based on parcels rather than zones and makes use of measures street density, giving more direct representation of and sensitivity to the microenvironment. However, the two models share limitations, according to Griesenbeck (personal communication, 2007):

> Both models take into account non-motorized modes. Neither represents infrastructure like bike lanes, those pedestrian tunnels over freeways, or pedestrian bridge crossing; pedestrian detail is just not there for a number of reasons but mainly because it's so hard to keep track of. It's possible to ask the city or county for the number of miles of sidewalks but it's even hard for them to answer due to gaps, streets with only one side of sidewalks, etc.

According to the 2006 MTP, "SACOG's models were unable to examine definitively localized shifts to bicycling that might accompany community design changes" (p. 31). The plan predicts that "at the regional level the share of bicycle and walk trips in 2025 stays at 6 percent" (MTP, 2006; p. 31), a forecast that

presumably does not take into account the potential effects of community design. However, the plan asserts, “Intuitively, the incentives and improvements contained in community design should lead to more bicycling and walking” (MTP, 2006; p. 31).

Advisory Groups

SACOG has a Bicycle and Pedestrian Advisory Committee (BPAC) whose main function is to serve as an advisory committee to the SACOG Board of Directors. Although the BPAC does not play an active role in project selection, they are responsible for crafting the Bicycle and Pedestrian Funding Program Guidelines that the BPWG uses when ranking projects. They are also responsible for choosing four of the 11 Bicycle and Pedestrian Working Group members. The BPAC is not selective in that anyone may join; however, its membership is generally made up of SACOG staff, representatives from the six counties within the region, Air Quality Management districts, Caltrans, and local bicycle and pedestrian advocacy groups. The BPAC meets quarterly.

The primary responsibility of the Bicycle and Pedestrian Working Group (BPWG) is to rank proposed bicycle and pedestrian projects (see above). They then make recommendations to SACOG staff and the Board of Directors. Unlike the BPAC, the BPWG is a selective group in that members must be from certain types of agencies. More specifically, its membership includes people with expertise in planning, project engineering, bicycle and pedestrian issues, air quality concerns, transportation demand management (TDM), and transit as well as people from community groups (Table B-12). In addition, a SACOG staff member staffs each BPWG meeting.

Table B-12. Bicycle and Pedestrian Working Group

Expertise	Appointed by	Number
Planners	Planner's Committee	1
Project Engineers	Regional Planning Partnership	2
Bike/Ped	Bike/Ped Advisory Committee	4 (2 advocates, 2 professionals)
Air Quality	Air Districts	1
TDM	TDM Task Force	1
Transit	Transit Coordinating Committee	1
Community Groups	Regional Planning Partnership	1
TOTAL		11

Source: 2008 Bicycle & Pedestrian Funding Program: Guidelines and Application Instructions, p. 23

6. Bicycle and Pedestrian Projects

Between 1991 and 2006, approximately 170 bike/ped projects were programmed in the Regional Transportation Improvement Program (RTIP) in the SACOG region. These projects ranged from the construction of bike lanes to the installation of sidewalks. Table 13 summarizes the breakdown of projects by project type, and Table 14 lists some of the more important projects (as identified by bike/ped advocates) that have been completed. Figures B-6 and B-7 show two such projects.

Table 13. Breakdown of Bike/Ped Projects by Project Type in the SACOG Region, 1991-2006

Category	Number of Projects	Category	Number of Projects
Bike Lanes	14	Implementation	5
Bike/Ped Facilities	14	Planning	5
Bike/Ped Improvement	24	Right of way acquisition	1
Bikeway/Path	40	Sidewalk	14
Bridge/Overcrossing	9	Trail	37
Education	4	Tunnel/Undercrossing	3

Table 14. Key Bike/Ped Projects in the SACOG Region, 1991-2006

Project Location	Project Description
Midtown Sacramento: 19th and 21st streets; L, N, P and Q streets	3 to 2 lane conversions, addition of bike lanes
Lake Natoma- South	Trail system with Highway 50 overcrossing
Sacramento- Tower Bridge	Sidewalk widening and shoulder
Davis	I-80 over and undercrossings
North Midtown Sacramento	Traffic calming projects (ex. half-street closures)
Sacramento- Regional Transit	Bike racks on buses
Sacramento- Midtown, Downtown	Stop bars at signalized crossings
Sacramento- 10th and I streets	Bulb-out
Sacramento- Mill Creek and West El Camino	Signal and marked crosswalk
Folsom	Refurbished bridge for bike/ped

Figure B-6. Highway 50 overcrossing

Figure B-7. Interstate 80 Undercrossing in Davis, CA

In general, funding for bicycle and pedestrian projects has increased over the years from 1991 until 2006 (Figure B-8). However, it should be noted that there is considerable variation by year. Of particular note are the significant increases in funding from 1994 to 1995 and from 1999 to 2000 followed by significant decreases the next years (1996 and 2001). It is also of note that the relatively high amount spent in 2000 is primarily due to the Sacramento County Bikeway Master Plan project, which represents roughly one-third of the total spending for 2000.

Between 1991 and 2006, total bicycle and pedestrian spending in the SACOG region varied considerably by county (Figure B-9). For example, total spending in

Sacramento County was more than 130 times total spending in Sutter County (Table 15). Similarly, spending per capita on bike/ped projects varied considerably for the different counties within the SACOG region. On the low end, Sutter County spent an average of $6.78 per capita on bike/ped projects between 1991 and 2006 whereas, on the high end, Yolo County spent an average of $97.22 per capita (Table 15).

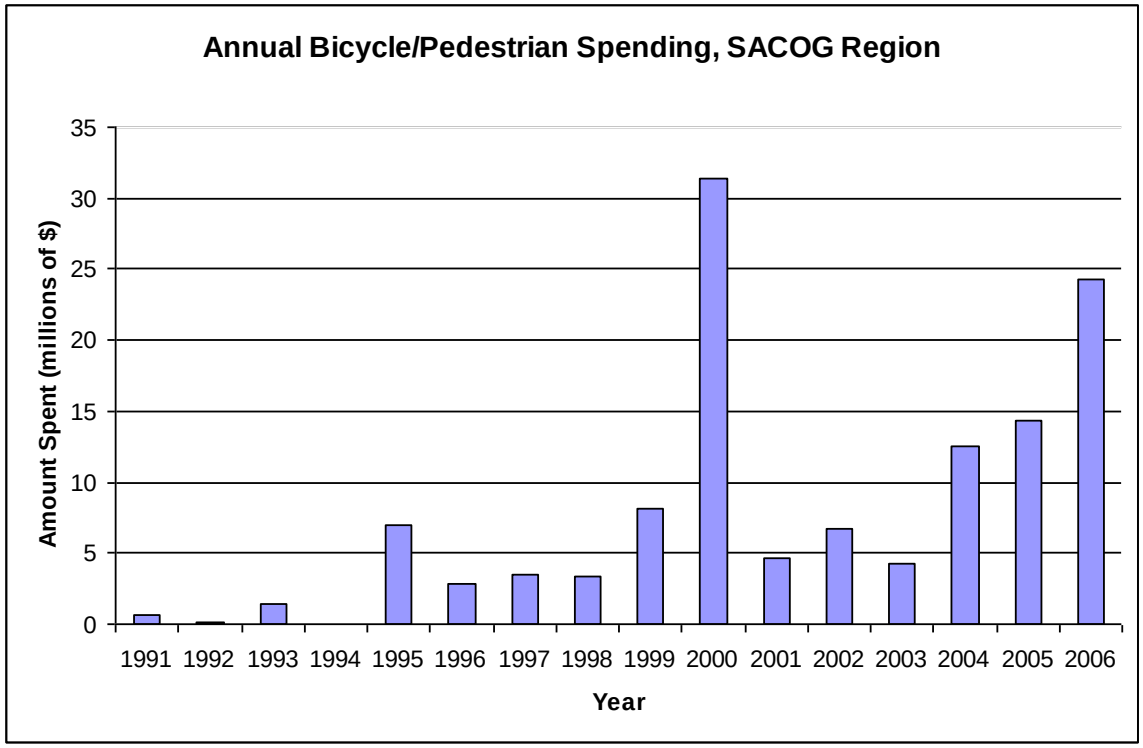


Figure B-8. Annual Bike and Pedestrian Spending, SACOG Region, 1991-2006

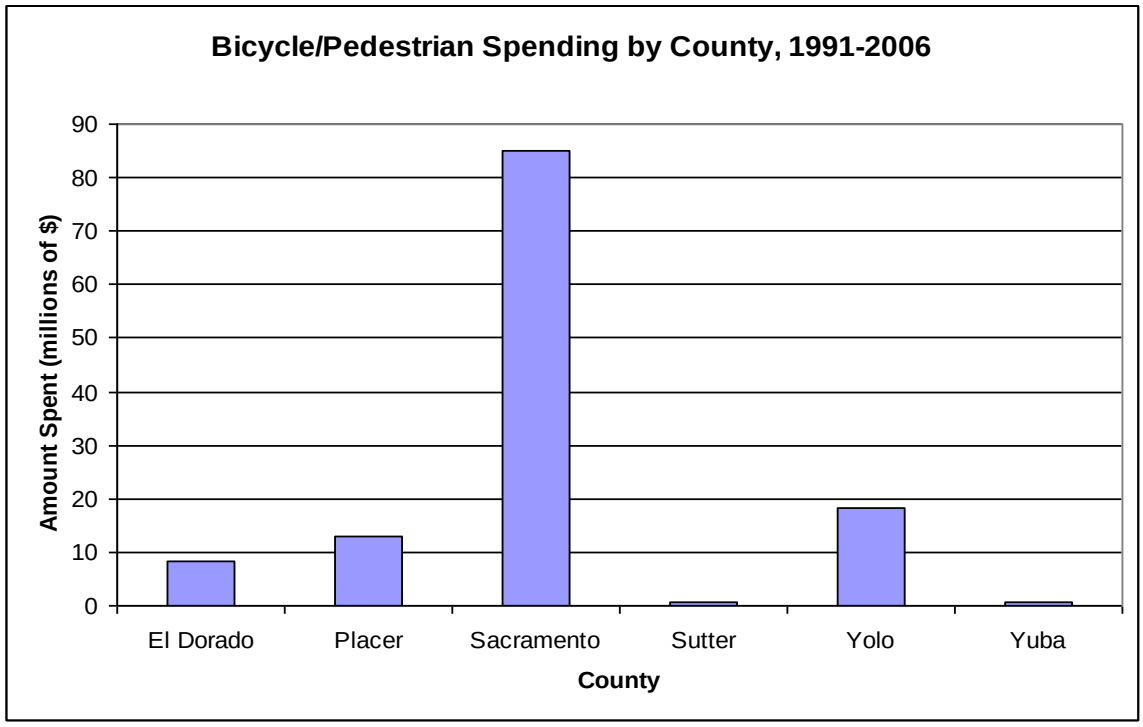


Figure B-9: Total Bicycle and Pedestrian Spending by County 1991-2006

County	City	Bicycle/ Pedestrian Spending by Jurisdiction*	Total Bicycle/ Pedestrian Spending for County	County Share of Region	2000 Population	Spending per Capita
El Dorado		$8,147,553	$8,147,553	6.5%	178,066	$45.76
Placer		$11,600,316	$12,835,316	10.2%	326,242	$39.34
	Rocklin	$910,000				
	Roseville	$325,000				
Sacramento		$65,994,921	$84,945,921	67.6%	1,374,724	$61.79
	City of Folsom	$9,065,000				
	City of Galt	$136,000				
	City of Sacramento	$9,750,000				
Sutter		$620,000	$620,000	0.5%	91,410	$6.78
Yolo		$15,774,427	$18,286,427	14.6%	188,085	$97.22
	Davis	$1,776,000				
	West Sacramento	$182,000				
	Winters	$232,000				
	Woodland	$322,000				
Yuba		$763,000	$763,000	0.6%	70,396	$10.84
Region Total			*$125,598,217*		*2,228,923*	*$56.35*

* Not all cities within county shown

Table B-11: Funding for Bicycle and Pedestrian Projects SACOG region 1991-2006

2000 Population Source: US Census, 2000a

7. Influences

SACOG was in a good position to take advantage of the opportunities that ISTEA offered to enhance bicycle and pedestrian use, thanks to both support from the state and from within the region. The 1990 Regional Transportation Plan considered non-motorized modes an important part of the transportation system and drew on state sources to fund bicycle and pedestrian infrastructure. In the early 1990s, SACOG adapted its travel demand forecasting model to account for non-motorized modes. In

addition, strong bicycle and pedestrian advocacy groups have pushed SACOG and local governments within the region to integrate bicycle and pedestrian concerns into transportation plans, have provided valuable input in the project selection process, and have encouraged cities and counties to apply for funds to improve bicycle and pedestrian safety and facilities.

Two advocacy groups are most often given credit for advancing the cause of non-motorized transportation in the region. The Sacramento Association of Bicycle Advocates (SABA) was formed in 1991 and incorporated as a 501(c)3 nonprofit organization in 2003. Currently SABA has more than 1,400 members in the six-county Sacramento region. SABA works to increase the number and safety of bicycle trips. The organization has been instrumental in getting bicycle facilities built in the region and assuring that bicyclists are considered in policies and planning. Patterned after Walk Boston, Walk Sacramento was incorporated in 1998 to address pedestrian issues in the region. In recent years, the organization has effectively participated in the review of proposed development projects in the City of Sacramento to ensure adequate consideration of pedestrian concerns. One of the most important factors to success, according to President Anne Geraghty (personal communication, July, 2007), is just being present: “Now, by being at the table, our views get considered.”

Planners in the region attest to the effectiveness of these advocacy groups. José Luis Cáceres (personal communication, July, 2007), planner at SACOG, believes that they have played a strong and positive role in the planning process: “they’ve been invaluable.” Chris Morfas (personal communication, April 18, 2008)

stresses the importance of the presence of advocacy groups in terms of providing needed support for local government officials to back bike/ped friendly policies. Ed Cox, Bicycle Coordinator for the City of Sacramento, gives credit to these groups for bringing greater attention to bicycle and pedestrian issues:

> I see a greater awareness, sort of like a mental checklist that people go through to say, well, we're going to propose this, make sure you include SABA, the bicycle advocates, make sure you talk to Walk Sacramento, make sure you get these people to buy into this idea that you're proposing. That was never there before. The advocates have made a big affect on how important an issue is (E. Cox, personal communication, July 13, 2007).

But funding for bicycle and pedestrian projects from state and federal sources has also influenced regional and local plans and investments. For example, the state's requirement that localities applying to the Bicycle Transportation Account (BTA) have a Bicycle Transportation Plan has played a substantial role in improving bike/ped planning, according to Chris Morfas (personal communication, April 18, 2008). Tim Bustos describes the "trickle-down" effect of this requirement: "… that was kind of the beginning of the bike program in a lot of communities. It had a lot to do with why bicycle program managers and bike [coordinators] were hired" (personal communication, September 18, 2007). Federal CMAQ funding has also made a difference, according to Nancy Kays, former planner at SACOG:

> You really could not use CMAQ for anything but air quality beneficial projects. That left you with very few types of transportation projects you could really spend it on. That was very good for bike/pedestrians… we did a whole group of bike/pedestrian projects [in the 1990s] that kind of gave them a leg up, because they're easier to implement, they're smaller, they're cheaper… it's easier to plan them and so forth. So, the fact that CMAQ was established and in a way it almost earmarks money for bike/pedestrian (personal communication, August 31, 2007).

Currently, a majority of the projects funded under SACOG's BPFP continue to use CMAQ money.

Federal and state policy that shifts the power of funding decisions from Caltrans to the MPOs has also had indirect impacts on bicycle and pedestrian facilities, according to Ken McGuire (personal communication, August 4, 2008). The Metropolitan Transportation Commission (MTC), the MPO for the San Francisco Bay Area, for example, adopted a routine accommodation policy in 2006 (EBBC, 2007). Because of its power over funding, MTC can ensure that Caltrans carries out this policy in the project development phase, including design and construction. MTC developed a checklist that is used to evaluate how well each project satisfies the routine accommodation policy. SACOG has not taken advantage of this power to the same degree, though it has a good working relationship with the Caltrans district on these issues. However, it should be noted that a statewide routine accommodation policy (AB 1358, the California Complete Streets Act of 2008) will go into effect in 2011 (Leno, 2008).

Interagency partnerships have also been an important factor. Local jurisdictions have sometimes pushed bicycle and pedestrian interests from below. The cities of Sacramento and Davis, as noted earlier, have been national leaders in the areas of pedestrian and bicycle planning, respectively. Lateral influences have also become important. For example, the Department of Health Services is now a major player motivated in part by the governor's interest in exercise and fitness, "because everybody marches to that tune. Exercise, fitness, health, etc… that gets the Department of Health Services on board…they're on every committee that we

have here at Caltrans" (K. McGuire, personal communication, July 13, 2007). The Sacramento Metropolitan Air Quality Management District (SMAQMD) has also been a supportive partner in efforts to increase walking and bicycling (K. McGuire, personal communication, August 4, 2008).

Finally, it is important to consider external factors that are currently influencing the transportation world at the federal, state, regional and local levels. Some of these factors, such as climate change concerns, gas price fluctuations, and the economic downtown, are creating a new impetus for bicycling and pedestrian planning. Chris Morfas (personal communication, April 18, 2008) points to "external circumstances" – "a global economic crisis," "the nation's economics," and "growth in disparity of wealth" – as driving some people to walk and bicycle more.

8. Ongoing Challenges

Despite progress in bicycle and pedestrian planning in the SACOG region, several challenges remain, according to planners and advocates in the region:

- Funding complexity: The availability of increased funds for bicycle and pedestrian projects has come with an increased complexity in the application and funding process, particularly for federal funds. This complexity has deterred cities and counties from applying for federal funds, according to Chris Morfas, Ken McGuire, and others. Smaller cities and counties may not have the staff expertise to apply. This is especially a problem for the TE program; local governments prefer to apply for funding from the state's BTA.

> It's a cumbersome process just in general to move from an idea to a full project. You get federal funds you have to jump through these hoops. If you get state funds, congratulations! State funds might still be federal funds. You have to jump through those hoops. Local cities don't necessarily have a lot of money set aside to do the bicycle/pedestrian projects. I mean, money is an issue, but the process is also an issue (JL. Cáceres, personal communication, July 2007).

- Separation of government funding programs: In general, governmental funding programs function independently of one another with only the "best" projects getting funded by that program. Thus, while bicycling and pedestrian projects have many benefits making them eligible for funding under multiple programs, they don't always offer the "best" solution in any given funding category and, thus are often overlooked by funding agencies. Chris Morfas explains the problems associated with this siloed approach to government:

> …We're also burdened by the whole silo approach to government in America. I mean, walking and bicycling have benefits for public health, but such projects are probably not the best use of public health funds to reduce obesity. There are other things...walking, bikes, and sure it's great for national security because we reduce oil consumption, but it's not the best. Walking and bicycling are good for congestion relief, but not the best use of funds for congestion relief. Walking and bicycling are good for air quality, but not the single best investment to improve the air. But how many different things can you invest money in that are good for...all of those areas? Not many. So, walking and bicycling really suffer from, kind of a lack of a holistic approach we take towards infrastructure investment in this country (personal communication, April 18, 2008).

- Project priorities: Most of the funding is going to recreational paths. These projects are less likely to reduce vehicle trips and their influence is unlikely to show up in data on commute modes from the U.S. Census.

- Professional knowledge: Walt Seifert, Executive Director of SABA, feels that there is a lack of knowledge of bicycle and pedestrian planning among transportation planners and engineers in the region. As a result, many small steps that would be beneficial for bicycling are not taken, including: getting people across the street safely, improving building orientation, addressing street width, increasing shade, and implementing complete streets concepts (personal communication, 2007).

- Implementation: While cities and counties are receiving more funds for projects, they don't necessarily have the staff, resources, or proper channels to carry out implementation. According to McGuire,

> We've had some issues with these projects being delivered. It's a problem, and that kind of overshadows our equitable distribution a little bit, because it really looks bad when you've given the money out, and no one's spending, or only a couple of local agencies are spending the money and that just doesn't look good. So, we have to kind of go back and rethink; what do we want to emphasize when we pick projects? Do we want to emphasize maybe local agencies that have a good history with us at delivering projects? If we did a continued pattern of not spending the money and not delivering the projects, then that puts the whole program in jeopardy, and that's not a good thing (personal communication, July 13, 2007).

- Professional attitudes: Perhaps because of that lack of knowledge, transportation planners and engineers do not always think about bicycle and pedestrian needs. Ken McGuire at Caltrans explained, "when we do projects in Sacramento, it should always be on our mind that we need to accommodate bicyclists in that corridor" (personal communication, July 13, 2007).

- Education: Few programs exist to provide training to children or adults on how to

safely walk or bicycle within the community. Residents lack knowledge on traffic laws, the best routes, and bicycle equipment. Motorists are poorly trained with respect to pedestrians and bicyclists. The state's plans tend to focus on engineering strategies with little emphasis on education (K. McGuire, personal communication, August 4, 2008).

- Multiplicity of policies: Many state, regional, and local policies supporting walking and bicycling in the Sacramento region have been adopted over the past several decades. Although these policies have had many positive effects, it is also possible that having multiple policies is dividing the attention of those working to improve bicycle and pedestrian conditions (K. McGuire, personal communication, August 4, 2008). As new policies are developed, it is important to integrate rather than simply add new layers onto bicycle and pedestrian programs.

- Public opinion: The public opinion of cyclists tends to be negative, especially among drivers. According to Brain Williams of the Sacramento Transportation Authority (interviewed for an article by Daniel Weintraub), cyclists themselves can often be their own worst enemy. A cyclist who runs a stop light or rides against traffic, for example, hurts the image of cyclists in general. Williams goes on to say "We talked to people about cyclists and they had a generally negative opinion. They would say, 'I hate those cyclists because they don't stop at stop signs, or they ride in the middle of the road'" (Weintraub, 2008).

- Behavior change: The ultimate challenge is to create conditions that will increase bicycling and walking. Creating supportive conditions is going to take some time, though high gas prices seem to have increased the number of bicyclists on the streets of Sacramento. An important step toward behavior change is cultural change:

> There's a growing population of people who like to ride on cruiser bikes; they're these big, balloon tire things, and they go bar hopping. That is becoming a trend, particularly in downtown Sacramento, which I have not seen until the last couple of years. Now they're everywhere I look (E. Cox, communication, July 13, 2007).

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APPENDIX C

BRTB Case Study

Analysis of Bicycle and Pedestrian Treatment in the Baltimore Region

Lanier McRee

ICF International

May 2009

Appendix C: BRTB Case Study

1. BRTB Background

The Baltimore Regional Transportation Board (BRTB) is the federally mandated MPO for the Baltimore region (Figure C-1). The BRTB is responsible for transportation planning and policy, including development of the long range transportation plan (LRTP) and the Transportation Improvement Plan (TIP), for Baltimore and the surrounding counties. The BRTB is housed within and supported by the Baltimore Metropolitan Council (BMC), a regional organization comprised of the six jurisdictions: Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties and the city of Baltimore. The city of Annapolis, the state capital and largest city in Anne Arundel County, also works with the BMC. The BMC's goal is to improve the quality of life and economy of the region through regional collaboration on a variety of plans and programs. The BRTB is made up of members of the BMC Board; representatives from the Maryland Departments of Transportation, Environment, and Planning; and the Mayor of Annapolis (BMCa, 2007).

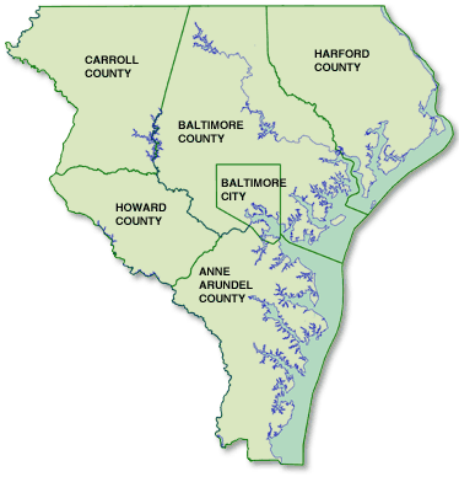

Figure C-1. The Baltimore Regional Transportation Board (BRTB) Region

Because of rapid development and air quality non-attainment in the Baltimore region, the BRTB has a distinct interest in encouraging non-motorized forms of transportation. Using the US Census Bureau's 2005 American Community Survey, the Thunderhead Alliance ranked the city of Baltimore's bicycle mode share 31st among the top 50 largest US cities (Maryland ranks 43rd) and its pedestrian mode share 10th (Maryland ranks 30th). The Thunderhead Alliance calculates that the average bicycle commuting mode share across the largest 50 cities is 0.7%, compared with just over 0.4% for Baltimore. The percent of work trips that are made on foot in the largest 50 cities is 4.48%; the city of Baltimore's mode share is just over 7% (Thunderhead Alliance, 2007). Figure C-2 and Figure C-3 show the percentage of people bicycling and walking to work in the BRTB jurisdictions (US Census, 1990; US Census, 2000). It is important to note that these figures probably underestimate bicycle and pedestrian mode shares since the census only captures the "primary" mode used for commuting; for example, most transit work trips start with either a bicycle or pedestrian leg; also, many non-work trips, which are not captured in the census, may be closer to home, and therefore, more likely to be walked or biked.

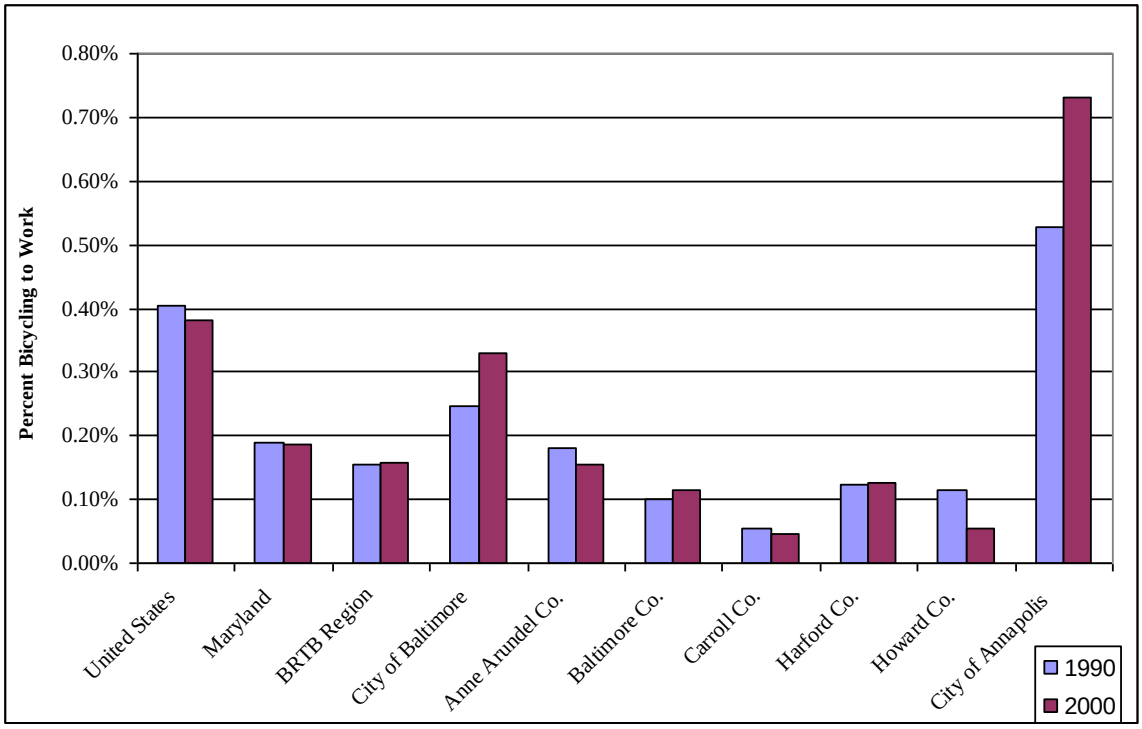

Figure C-2. Percent Bicycling to Work in BRTB Region, 1990 & 2000

The mode share for bicycling to work is lower in the Baltimore region6 than the United States as a whole. In general, increased rates of walking and biking are obvious within the more densely developed areas – the cities of Baltimore and Annapolis. Carroll County, the least populous and least dense county in the region, stands out for its unusually low rate of bicycling in both 1990 and 2000. Despite a very low number of bicycle facilities in the City of Baltimore, the city's bicycling mode share is the highest of the six jurisdictions that comprise the BRTB; however, it is still below the national average.

[6] The regional average was derived by calculating the modes share for Anne Arundel, Baltimore, Carroll, Harford, and Howell Counties and the City of Baltimore as a whole; it is a weighted mode share, not simply and average of the mode shares across the jurisdictions. The mode share for the city of Annapolis is captured within the Anne Arundel calculations but is also shown separately for illustrative purposes.

Between 1990 and 2000, the national bicycle mode share decreased slightly. However, the Baltimore region's bicycle mode share remained basically constant. Mode share changes across the region varied significantly: there were large gains in the cities of Baltimore and Annapolis; modest gains in Baltimore and Harford Counties, and slight decreases in Anne Arundel and Carroll Counties. Howard County is the only jurisdiction to show a substantial drop, losing over 50% of the 1990 bicycling mode share (US Census Bureau, 1990; US Census Bureau, 2000).

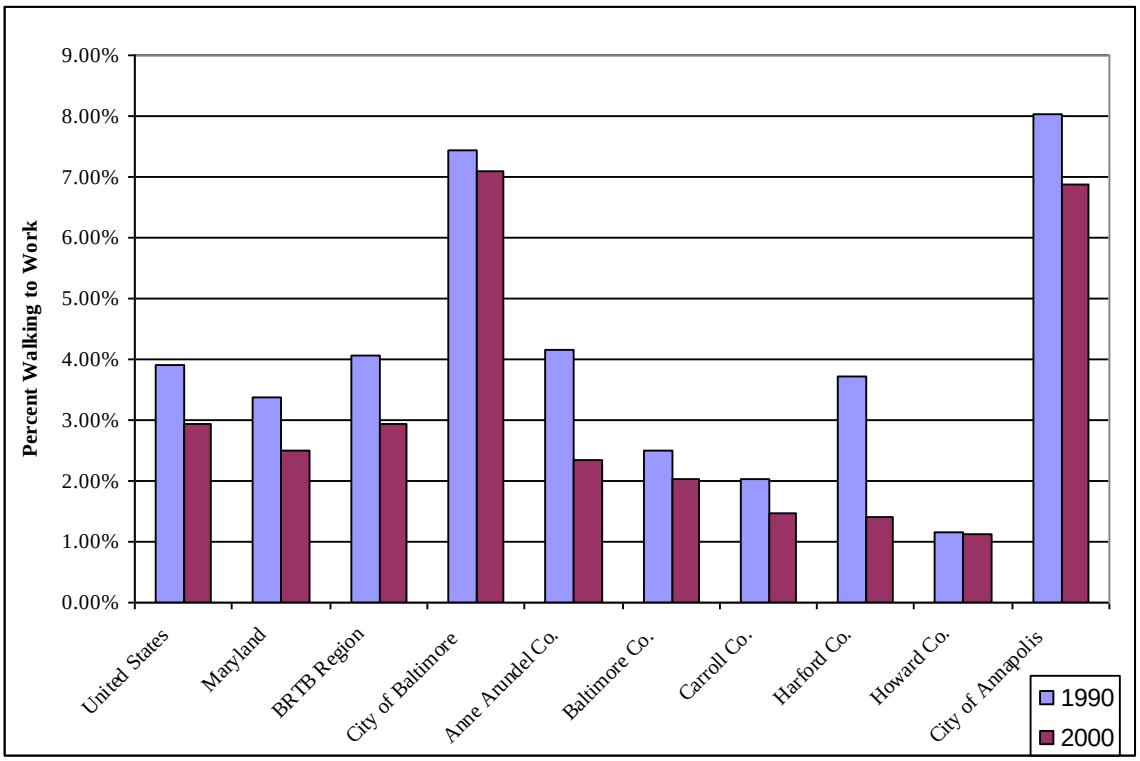

Figure C-3. Percent Walking to Work in BRTB Region, 1990 & 2000

The regional pedestrian mode share is on par with than the national average. As with bicycling, much higher mode shares are seen in the cities of Baltimore and Annapolis. In every jurisdiction, the percentage of workers walking as their primary means of travel to work decreased. The Baltimore region has a strong base on

which to expand bicycling and walking, especially pedestrian mode, for which current usage is at or above the national average in several jurisdictions, and in the more urbanized areas of Baltimore and Annapolis. The BRTB has an opportunity to increase the use of non-motorized modes by developing better facilities through the LTRP and TIP and promoting bicycling and walking in the region.

The Thunderhead Alliance evaluated existing and planned bicycle facilities in the 50 largest cities. A bicycle facility is defined as a striped bike lane, a multi-use path, or a signed bike route. Baltimore ranks very low, 40th out of 50, for existing miles of bicycle facilities; it has 0.3 miles of facility per square mile of area compared with a national average of 1.23 miles per square mile. However, the city has plans to increase its bike facilities to 5.2 miles per square mile. This ambitious plan is nearly double the national average of 2.49 miles of bicycle facility per square mile and places Baltimore fifth for planned facilities.

2. State context

State Bicycle and Pedestrian Program

Maryland employs two full time staff and retains one advisory committee devoted to bicycle and pedestrian matters. The Director of Bicycle and Pedestrian Access, based in the Office of the Secretary within MDOT, focuses on policy issues and all transportation modes. The Director works with local, regional, state, and federal contacts to ensure that bicycle and pedestrian access are considered in transportation projects. He also serves as a bicycle and pedestrian advocate before the Maryland General Assembly (M. Jackson, personal communication, December 18, 2007).

Maryland also has a Bicycle and Pedestrian Coordinator, as required since ISTEA, who is housed within the SHA. The Coordinator manages the Bicycle Retrofit Fund and works with district offices to identify and prioritize retrofit needs. The position also reviews designs for both new construction and maintenance projects for compliance with state bicycle and pedestrian policies and coordinate with local partners to improve connectivity and expand the Maryland signed bicycle route system. Since the Bicycle and Pedestrian Coordinator is housed within the State Highway Administration, the majority of the position's attention is given to state roads with little or no emphasis on expanding and coordinating local or regional bicycle and pedestrian efforts (S. Yanovitz, personal communication, December 27, 2007).

Finally, the Maryland Bicycle and Pedestrian Advisory Committee (MBPAC), formed in 1991 as the Bicycle Advisory Committee, advises state agencies on issues related to bicycling and pedestrian projects, Safe Routes to School, and other programs. MBPAC makes recommendations and clarifications on bicycle and pedestrian related programs and legislation, funding, public awareness, planning, and safety and education. The MBPAC has four subcommittees: Commuting and Transportation, Education and Awareness, Legislative and Government Affairs, and Tourism and Product Development (MDOT, 2007).

The state of Maryland owns and operates approximately 18% of all roads in the state; many of these roads are the major arterial and thoroughfare roads in the state. While the state can directly improve these facilities to accommodate bicycles and pedestrians, over 80% of roads are locally owned and operated. Thus, local

jurisdictions are responsible for the majority of roads that are used by bicyclists and pedestrians. These jurisdictions need both funding and policy support from the state in order to accommodate these users. Therefore, the state of Maryland has several programs to support bicycle and pedestrian activities, including supportive legislation that impacts local planning, state-level planning that serves as a guide for local initiatives, and state level funding sources.

Funding Programs

Federal

The Intermodal Surface Transportation Efficiency Act (ISTEA), passed in 1991, and the subsequent reauthorizations, including the most recent Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), signed in 2005, have made formerly unavailable federal funding sources available to bicycle and pedestrian projects. These funds come through a variety of sources including Transportation Enhancements (TE), Safe Routes to School (SRTS), Congestion Mitigation and Air Quality (CMAQ), and Recreational Trails funding.

Local jurisdictions in the Baltimore region can take advantage of all of these sources of funding. Maryland's SRTS program, which receives approximately $2 Million a year in federal dollars, is in its third grant cycle and many jurisdictions are using these funds for small infrastructure improvements and bicycle and pedestrian programs (America Bikes, 2005b). At this time, the Baltimore region, via the BRTB, has not applied for SRTS funds for a regional project.

Local jurisdictions or regions can apply for CMAQ funding. Maryland receives approximately $51.4 Million annually through the CMAQ program (America Bikes, 2005b). While this is a substantial source of funds for bicycle and pedestrian projects

in some regions, few, if any, bicycle and pedestrian projects in the Baltimore region have used CMAQ funding. FHWA provides annual reports on CMAQ funds through FY2000; according to these reports, no bicycle and pedestrian project in Maryland used CMAQ funding from 1992 through 2000 (FHWA, 2008).

Like SRTS funds, CMAQ funds are administered by the state in Maryland. According to FHWA's CMAQ Guidance, states can use their CMAQ funds in any nonattainment or maintenance area and are under no statutory obligation to sub-allocate CMAQ funds. However, states are encouraged to consult with MPOs to determine CMAQ priorities and to allocate funds accordingly (FHWA, 1999). Accordingly, the Maryland Department of Transportation (MDOT) has primary responsibility for Maryland's CMAQ program and, after reviewing input from county staff, MPOs, and elected officials, makes the final CMAQ project programming and funding decisions (TRB, 2002).

In order to advise MDOT, the BRTB holds a competitive selection process to award CMAQ funds. In FY2008, CMAQ funding in the Baltimore region is expected to be approximately $1 million dollars. The BRTB has several requirements for application:

- Projects must provide emission reductions to receive funding;
- Local jurisdictions or public-private partnerships (with local support) may apply;
- Projects with operating expenses may apply but preference will be giving to those involving capital funding;
- Funds will be provided on a reimbursement basis;
- Cash matches are required: 10% for public projects, 50% for public-private partnerships (BRTB, 2007).

Thus, winning CMAQ funds requires demonstration of a significant air quality improvement (through emission reduction). Most bicycle and pedestrian projects show only small air quality impacts, making these projects less competitive in the application process.

TE dollars are the most highly recognized, based on the interviews conducted, source of bicycle and pedestrian funding in the Baltimore Region. Yet, they appear to be seldom used. Like SRTS and CMAQ, these funds are programmed by the state. They must be matched 50/50 with local funds; several local and regional planners noted that they do not apply for TE funds for bicycle and pedestrian projects because of this high matching requirement. Maryland is perhaps the only state in the country that requires a 50/50 local match to TE dollar (NTEC, 2007). Political will in most jurisdictions does not allow bicycle and pedestrian accommodations to receive such a large portion of local funds, making it difficult to meet the 50% matching requirement (J. Bridges, personal communication, December 11, 2007). The state maintains that the high matching requirement increases local ownership of projects and magnifies the impact of limited TE dollars (D. Simmons, personal communication, December 20, 2007). In addition to the high matching requirement, TE funding also requires an application process that is daunting to many of the smaller jurisdictions.

From 1992 through 2007, Maryland programmed $147.9 Million in TE funds. Of this, they obligated $105.5M and reimbursed only $81.5 Million, or 55%. Over this same time period, Maryland programmed only 36.6%, or approximately $54 Million,

of its TE funds to bicycle and pedestrian-related (Category 1 and 2) projects;[7] nationally, over 48.4% of TE funds are programmed for these projects (NTEC, 2007).

State

As with federal funding, state programs for bicycle and pedestrian facility improvements and programs have developed significantly since ISTEA. Before 1991, a mix of state, federal, and local money funded state road construction; wide shoulders were typically included, but there was no emphasis on bicycle and pedestrian improvements or safety measures. During this time, the state's policy was not to build sidewalks on state highways unless the local jurisdiction requested and funded their construction. The most consideration given to bicycles and pedestrians was to install safety grates. There were no specific state funds for bicycle and pedestrian improvements (D. Simmons, personal communication, December 20, 2007).

Since 1991, consideration for bicyclists and pedestrians has become more integrated into MDOT and the State Highway Administration's (SHA) planning, design, and construction process; including project funding.[8] Maryland has instituted three funds that can be used to build bicycle and pedestrian facilities: the Sidewalk Retrofit Fund (~$2M annually, late 1990s), the Bicycle Retrofit Fund (~$1.5M

[7] National Transportation Enhancements Clearinghouse, 2007. Category 1 projects include pedestrian and bicycle facilities such as new or reconstructed sidewalks, walkways, curb ramps, bike lane striping, paved shoulders, bike parking, bus racks, off-road trails, bike and pedestrian bridges and underpasses. Category 2 projects include safety and educational activities such as encouragement programs and education and safety instruction through classes, pamphlets, and signs.

[8] SHA is the highway division of the larger Maryland Department of Transportation. Other divisions include the Maryland Port Administration, Aviation Administration, Transit Administration, Transportation Authority, and Motor Vehicle Administration.

annually, early 2000s) and the ADA Retrofit Fund ($3M annually, mid-2000s). Together, these state-funded accounts have over $5 million dollars of Maryland General Fund money that can be spent annually on bicycle and pedestrian facilities. The SHA has persuaded the General Assembly to maintain these funds despite years of negative and/ or zero revenue growth for the state (D. Simmons, personal communication, December 20, 2007).

State Policy on Facilities

Maryland has a strong Smart Growth tradition that encourages mixed land uses, open space preservation, and walkable communities. The Maryland General Assembly passed five pieces of legislation and budget initiatives that together comprise the 1997 Smart Growth Initiative.[9] The 1997 legislation built upon the state's intervention policy (1974), which gives the Maryland Department of Planning the right to participate in local and state land use proceedings to advocate for outcomes that promote the welfare of the state's citizens, and the Economic Growth, Resource Protection, and Planning Act of 1992, which "articulated the State's growth policy through seven visions centered around concentrating development in suitable areas, protecting sensitive areas, and establishing funding mechanisms to achieve the visions" (MDP, 2007a); this act required that local comprehensive plans address these same seven vision.

In addition to these legislative acts, Maryland adopted several Smart Growth principles to guide its development (See Box). While such policies do not directly require bicycle and pedestrian accommodation, they send a clear message of the

[9] The 1997 Smart Growth Initiative is comprised of the Smart Growth Priority Funding Areas Act, the Rural Legacy Act, and legislation related to brownfields, living near work, and job creation tax credits.

state's priorities and require that local jurisdictions consider these in their planning. Indeed, MDOT cites the Smart Growth initiative as the reason for its increased commitment to bicycle and pedestrian transportation, stating in the Bicycle and Pedestrian Access Master Plan:

> MDOT's increased commitment to pedestrian and bicycle transportation is an outgrowth of Maryland's "Smart Growth" planning initiatives, which seek to improve quality of life for Maryland's citizens by promoting development policies that support existing communities and contain suburban sprawl. The benefits of promoting Smart Growth policies include reduced roadway congestion, enhanced access between homes, workplaces, schools, shopping and recreation areas, and reduced pollution of Maryland's air and water, including the sensitive Chesapeake Bay watershed. (MDOT, 2002a, p. 3).

In 1995, the Maryland General Assembly passed another piece of legislation that created the Bicycle and Pedestrian Access 2000 program. This act brought about several important changes. The act requires planning and studies of bicycle and pedestrian access, bicycle access to public institutions of higher learning and state facilities, and, importantly, the construction of sidewalks along urban highways (Div. of Legislative Services, MD General Assembly, 2000).[10] Prior to 1995, the SHA was not allowed to build sidewalks on state highways unless the local jurisdiction requested, *and was willing to pay for* the sidewalk; that is, if a city wanted a sidewalk along a state highway, the city had to give up state transportation funds needed to build and maintain its road network in the amount required to build the sidewalk. However, the 1995 law requires SHA to build sidewalks with project funding as long

[10] An urban highway is defined as "a highway, other than an expressway that is A) 1) constructed with a curb and gutter and an enclosed type storm drainage system; 2) located in an urban area and on which is located a public facility that creates appreciable pedestrian traffic along the highway from adjacent areas; 3) location within urban boundaries as defined by the US Census Bureau; or 4) located within the boundaries of a municipal corporation; and B) part of the state highway system. Maryland Code §8-630.Sidewalks or bicycle pathways along urban highways; nighttime illumination.

as the local jurisdiction agrees to maintain the sidewalk once it is built; there are exceptions in situations when SHA "determines that the cost or impacts of constructing the sidewalk would be too great in relation to the need for them or their probable use or the local government indicates that there is no need for sidewalks" (Md. Trans. Code §8-630).

In 2000, the Maryland General Assembly built upon the Bicycle and Pedestrian Access 2000 program, creating the Bicycle and Pedestrian Access 2001 program. The legislation states that it is "in the public interest for the State to include enhanced transportation facilities for pedestrians and bicycle riders as an essential component of the State's transportation system" (Md. Trans. Code §2-602). The legislation continues

> Access to and use of transportation facilities by pedestrians and bicycle riders shall be considered and best engineering practices regarding the needs of bicycle riders and pedestrians shall be employed in all phases of transportation planning, including highway design, construction, reconstruction, and repair as well as expansion and improvement of other transportation facilities" (paragraph 1).

The bill further mandates that "the department shall work to ensure that transportation options for pedestrians and bicycle riders will be enhanced and that pedestrian and bicycle access to transportation facilities will not be negatively impacted by the project or improvement" (paragraph 3).

According to one SHA administrator, this requirement by the state to accommodate bicyclists and pedestrians on state highways altered the philosophy

behind highway planning and design at the state level (D. Simmons, personal communication, December 20, 2007). The act also established the Director of Bicycle and Pedestrian Access within the Office of the Secretary, created the Maryland Bicycle and Pedestrian Advisory Committee, required the state to produce a 20-year Bicycle and Pedestrian Master Plan, and launched the Pedestrian Safety Program.

Maryland's 20 year Bicycle and Pedestrian Master Access Plan Goals

1. Facility Integration and Expansion;
2. Facility Preservation;
3. Safety;
4. Education and Encouragement; and
5. Smart Growth.

Maryland Department of Transportation, 2002.

State Plans

Maryland produces its federally mandated transportation plan every five years. The transportation plan focuses upon four goals: (1) Efficiency, (2) Mobility, (3) Safety and Security, and (4) Productivity and Quality (MDOT, 2004). The state transportation plan mentions bicycling and pedestrian transportation modes in regards to the mobility goal. The objective cited within this goal is to support varied modal needs with cost-effective options, and it recommends that bicycle and pedestrian accommodation be included in highway improvements where ever appropriate and feasible (MDOT, 2004). In addition to mentioning bicycle and pedestrian needs in the long range plan, the 2007-2012 Consolidated Transportation Program, the state's six year capital improvement plan for transportation projects, includes specific bicycle and pedestrian improvements that will be completed along state highways (MSHA, 2007).

Maryland also has a 20-year Bicycle and Pedestrian Access Master Plan, an outgrowth of the Bicycle and Pedestrian Access 2001 program, which serves as a

guide to developing, improving, and maintaining bicycle and pedestrian transportation for the state. The Access Plan primarily considers conditions for bicycles and pedestrians along state highways but also serves as a motivating force for other jurisdictions, encouraging them to improve bicycle and pedestrian travel in Maryland. The Access Master plan consists of three documents, the Master Plan, the Technical Appendix, and Model Ordinances.

The Access Master plan lists five goals that "articulate the State's direction for accommodating the needs of pedestrians and bicyclists over the next 20 years in a manner that supports related goals in the Maryland Transportation Plan" (MDOT, 2002a, p. 10). The goals are backed by policies and actions that, upon implementation, will achieve the Master plan's goals. The Master Plan is supported by the Technical Appendix, Bicycle and Pedestrian Facility Needs Assessment. This appendix chronicles the physical inventory conducted by MDOT on approximately 4,750 miles of roadway and provides a needs inventory. MDOT designated roads that need improvement as either Tier 1 or Tier 2; "roadways in Tier 1 demonstrate the greatest need for bicycle accommodations, whereas roadways in Tier 2 show less need" (MDOT, 2002b, p. 5). To be designated Tier 1 or 2, the road must be recommended for improvement in a local or regional plan and have a bicycling Level of Comfort of "E" or "F"; Tier 1 roads must also be within a Priority Funding Area (PFA)11 while Tier 2 roads do not (MDOT, 2002b). According to the State Director of Bicycle Access, Maryland is, perhaps, the only state required to conduct and present an annual progress attainment report on its bicycle and pedestrian efforts; it must

[11] "Priority Funding Areas (PFA's) are locations where the State and local governments want to target their efforts to encourage and support economic development and new growth." MDOT, 2002b, p. 5.

submit this report prior to making any budget requests (M. Jackson, personal communication, December 18, 2007).

The final component of the Access Master Plan is the Model Ordinance document. This component assists local jurisdictions with writing plans and policies that foster a walkable, bikeable community. The guide covers planning and policies for bicycle and pedestrian facilities, zoning policies that encourage compact land use and mobility, subdivision regulations that aid in facility construction. “The purpose of this model is to offer a broad range of useful tools as options for local governments to draw upon in their efforts to promote the development of bicycle and pedestrian access in their community, county, or region” (MDOT, 2002c, p. 2).

3. Bicycle/Pedestrian Considerations in Regional Plans

As noted previously, ISTEA fundamentally changed the attention given to bicycling and walking as viable transportation modes. The Baltimore region’s transportation planning before and after ISTEA illustrates the magnitude of the changes that this law initiated.

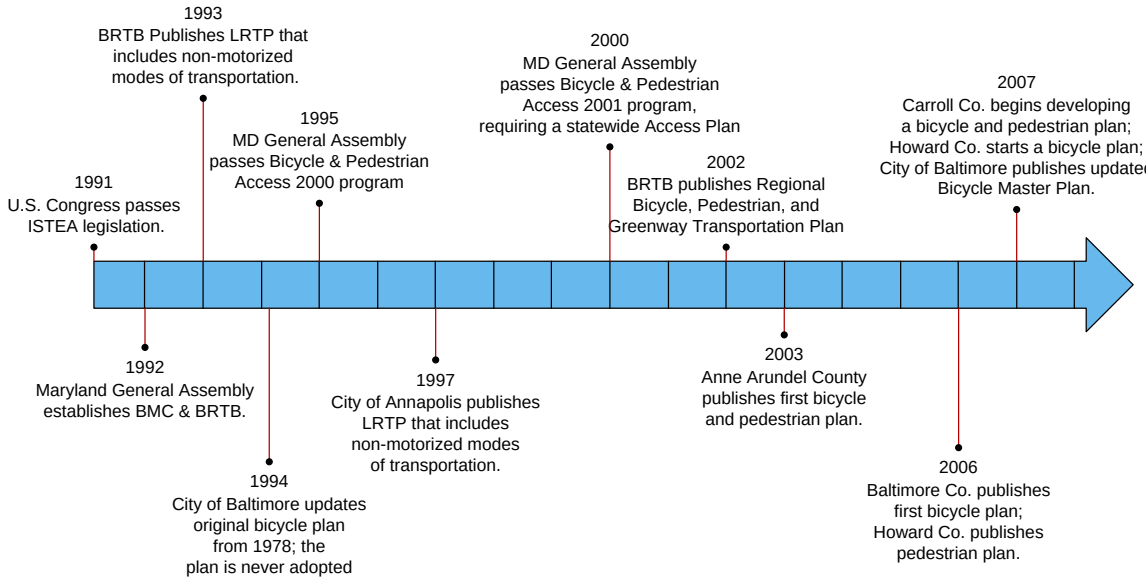

Figure C-4. Timeline of Important Bicycle and Pedestrian Activities in the Baltimore Region

Regional Transportation Plans

The BRTB produces a long-range regional transportation plan for the Baltimore area every four years and has done so since the BRTB's creation in 1992. Prior to 1992, the Regional Planning Council was responsible for long-range planning in the Baltimore region, including identifying transportation needs. The Regional Planning Council developed its last plan in 1986, a General Development Plan (GDP), in which one section is devoted to transportation. No GDP was developed between 1986 and 1992 despite the Maryland state law that requires updating the GDP every five years. In 1991, the Maryland General Assembly created the BMC and BTRB to replace the Regional Planning Council and the Baltimore Council of Governments; these new organizations then took over planning, resulting in the delay.

All of the BRTB's LRTP since 1993 and the 1986 GDP emphasize the importance of transportation to the regional economy and quality of life. However, the 1986 plan focuses on operating "the region's highway, transit, port, air and rail

facilities…in a complementary manner" (RPC, 1986, p. 8-3). There is *no mention of non-motorized modes of transportation*. Thus, the emphasis on bicycling and walking found in the plans after 1993 is a striking difference in current transportation planning as compared with planning under the Regional Planning Council. Indeed, neither the transportation section of the 1986 GDP nor the 1989 Baltimore Regional Transportation Needs brochure mention bicycling or walking as transportation modes; neither mode is even mentioned in either document.

Conversely, when the BRTB adopted its first transportation plan in 1993, *Transportation Outlook 1993*, after Congress had implemented the new ISTEA legislation, it includes a section on non-motorized elements of transportation. The plan directly cites the requirements of ISTEA as the driver of this section, stating "the requirements of ISTEA clearly indicate the high priority Congress intended for bicycles projects in this country's future transportation system" (BMC, 1993, p. 116). The most recent 2007 LRTP, *Transportation Outlook 2035: Creating a Blueprint for the Balitmore Region's Future*, follows the federal requirement to include "pedestrian walkways and bicycle transportation facilities" (BRTB, 2007, p. 8).

The 2007 LRTP includes considerable discussion of the bicycle and pedestrian transportation modes and includes a list of 29 bicycle and pedestrian "preferred alternatives" (BRTB, 2007, p. 135). In addition to listing planned bicycle and pedestrian projects, the LRTP acknowledges the potential of biking and walking as viable commuting modes, indicating that increased walking and bicycling could reduce congestion and improve air quality. Specifically, the third stated policy goal is to "plan for an integrated transportation system that is acccesible, equitable, and

reliable for all system users and that provides for enhanced connectivity between modes and destinations" (BRTB, 2007, p. 16). Expanding the bicycle and pedestrain facility network and providing better amenities, such as bicycle parking and bike racks on buses, are two strategies for making these non-motorized modes more feasible (BRTB, 2007).

The LRTP indicates that improving bicycle and pedestrian facilities will not only encourage a modal shift away from the single occupancy vehicle, thereby improving air quality, but it may also mitigate other public health concerns. According to the LRTP, "[T]ransportation planning investments impact community health and lifestyles" and "the sedentary lifestyle of many Americans – caused in part by auto dependency and a few bicycle and pedestrian facilities – has contributed to increased rates of obesity, diabetes, and heart disease" (BRTB, 2007, p. 102). The LRTP recognizes that improving conditions for bicycling and walking could reduce the occurrence of these public heath threats.

Other Bicycle and Pedestrian Plans

BRTB has also produced a regional bicycle and pedestrian plan, *Action Plan 2001: A Plan for Bicycling and Walking in the Baltimore Region.* The plan is distinct from the LTRP as it focuses solely on coordinating bicycle and pedestrian improvements in the region. *Action Plan 2001* details the benefits of bicycling and walking and defines the vision, goals, and milestones for them in the Baltimore region. It also provides recommendations to further the vision that "the Baltimore region will be a place where people have the comfortable, convenient, and safe option to travel on

foot and by bicycle for transportation and recreation" (Sprinkle Consulting, 2001, p. 11).

In addition to providing a vision and goals for the region, the plan gives an overview of existing bicycle and walking conditions, reviews certain engineering solutions, describes funding sources, provides recommendations for a regional route, and summarizes mobility-friendly policies and education programs. The goals of the bicycle and pedestrian plan fall into five categories: Facilities and Engineering, Policies and Practices, Education, Encouragement and Promotion, and Enforcement (Sprinkle Consulting, 2001). Twelve strategies, and corresponding action items, fall into these five groups, providing a multi-pronged approach to help the jurisdictions realize the envisioned network.

4. Local Government Role

Because of their role in land use and transportation decision-making, local governments play a vital role in fostering a bicycle and pedestrian friendly environment. Bicycle and pedestrian transportation planning is a required part of comprehensive plans in Maryland. The Maryland Department of Planning cites Article 66B, which outlines the content and procedural requirements for comprehensive planning, as the legal basis for requiring bicycle and pedestrian planning. Article 66B "specifically requires jurisdictions to address bicycle and pedestrian facilities in their comprehensive plans" (MDPb).

Despite Article 66B, among the BMC members, the state of bicycle and pedestrian planning varies substantially. In accordance with legislation, every jurisdiction at least mentions the bicycle and pedestrian modes in either their

comprehensive or transportation plan. But, the interpretation of what addressing bicycle and pedestrian facilities means seems to be up for debate. Some counties have specific plans while others only note that bicycle and pedestrian needs exist. Four jurisdictions currently have a bicycle and/or pedestrian plan covering at least part of their area; only the city Baltimore has a bicycle and pedestrian coordinator and a bicycle advisory commission. Table C-1 highlights the type and age of existing plans as well as some of the planning resources available in each jurisdiction.

Table C-1. Bicycle and Pedestrian Planning Resources – BRTB Member Jurisdictions

Jurisdiction	Separate B/P Plan	Year of B/P Plan	B/P Coordinator	B/P Commission(s)
Counties				
Anne Arundel Co.	Yes	2003	No	No
Baltimore Co.	Yes/ Half of Co.	2006	No	In Development
Carroll Co.	Developing	N/A	No	No
Harford Co.	No	N/A	No	No
Howard Co.	Pedestrian/ Developing Bicycle Plan	2006	No	Only during plan development
Cities				
City of Annapolis	No	N/A	No	In Development
City of Baltimore	Yes	2006	Yes	Mayor's Bicycle Advisory Council

Several jurisdictions have recently adopted or are currently developing bicycle and/or pedestrian plans. Others are organizing commissions to advise on bicycle and pedestrian issues. This recent surge in bicycle and pedestrian planning most likely grew out of the ambitious performance measures, or milestones, of the regional bicycle and pedestrian plan, Action Plan 2001. One milestone declared that

"all jurisdictions will have bicycle/pedestrian advisory committees established by 2004" (Sprinkle Consulting, 2001, p. 16). The regional plan outlines 10 milestones for which the BMC and the Bicycle and Pedestrian Advisory Group were to "prepare a yearly report card or status report tracking the achievement of these milestones and performance measures" (Sprinkle Consulting, 2001, p. 17). These performance measures have been neither implemented nor tracked. However, they do provide ideas for attainable policies and programs for local governments, including encouraging employees to walk or bike to work, adding bicycle racks in public areas, adopting bicycle parking ordinances, and accommodating bicycles on transit vehicles (Sprinkle Consulting, 2001).

Analyzing the plans related to bicycle and pedestrian transportation in each jurisdiction proved an interesting exercise. Every jurisdiction commented on the importance of bicycle and pedestrian planning for transportation while five noted bicycling and walking as important to recreation as well. There are several other benefits of bicycle and walking that would be expected when describing why these modes are important to consider in transportation planning. Table C-2 provides five of the most commonly noted benefits and shows whether each jurisdiction's plan makes note of that benefit.

Table C-2. Recognized Benefits of Bicycling and Walking – BRTB Member Jurisdictions

City	Congestion Mitigation	Demand Mgmt	Health	Air Quality	Quality of Life
Counties					
Anne Arundel Co.*	-	-	X	X	X
Baltimore Co.*	X	X	X	X	X
Carroll Co.	-	-	-	-	-
Harford Co.	X	X	X	X	X

Howard Co.	-	X	X	-	-
Cities					
City of Annapolis**	-	-	-	-	X
City of Baltimore*	X	X	X	X	-

*Benefits cited in Bicycle and/or Pedestrian Plan
**Benefits cited in Transportation Plan

In addition to planning and building facilities, local jurisdictions can also implement policies that encourage bicycling and walking. The state's bicycle and pedestrian plan model ordinances provide one source for local jurisdictions that want to use this strategy to increase the use of non-motorized transportation. One example is an ordinance that requires developers to build sidewalks. Every county interviewed (which includes all but Harford County) has a requirement that developers include sidewalks in their developments if particular criteria apply such as a certain zoning status, connectivity with other facilities, and distance to the nearest school. However, when asked about ordinances to support expanding bicycle and pedestrian facilities, no interviewee noted anything other than this subdivision ordinance, which was given as an example.

It appears that bicycle and pedestrian planning is, for the most part, just getting started. In the Baltimore region plans are being developed, and committees organized. Once these initial stages are completed, project and program implementation should begin. The city of Baltimore is ahead of the curve for the region. As noted earlier, the Thunderhead Alliance finds that the city has drastically increased its bicycle and pedestrian spending and the city already has a bicycle and pedestrian plan – and has had it, in some form, since the 1970s – and a bicycle advisory committee. Further, interviews with city staff uncovered that the city has put bike racks on its buses and hired a Public Relations Firm to design a Healthy

Lifestyles Campaign that will be rolled out along with the city's significant work to expand bicycle and pedestrian facilities.

5. Bicycle/Pedestrian Considerations in the Regional Planning Process

Funding

Transportation Outlook 2035 bases its financial constraints on funds available within the Maryland Transportation Trust Fund (MTTF). The Trust Fund is comprised of federal aid, corporate income taxes, operating revenues, bond monies, registration fees, motor fuel taxes, and vehicle titling taxes (Sprinkle Consulting, 2001). All federal aid, approximately 18% of the MTTF total, is directed through the State Transportation Improvement Program (STIP). The MTTF is divided into four spending categories. Approximately 39% of the MMTF is used for capital expenditures; operating expenses account for 40% of the MTTF; local governments receive roughly 17%; the remaining 4% goes to debt service (BRTB, 2007).

The MDOT Office of Finance determines how much of state revenues are dedicated to expansion projects. They use historical expenditures to determine the split between expansion and system preservation and take into account estimated annual operating expenses as well. After assuming an annual growth rate to account for inflation, the Office of Finance determines funding available for capital expansion by subtracting expenses for operating and systems preservation from total available revenue for each year. *Transportation Outlook 2035* allocates $17.9 billion for operations and $15.5 billion for capital expenditures. Of this $15.5 billion, the BTRB has allocated $6.8 billion for system preservation and assumed that $8.7 billion will

be available for expansion from 2013 to 2035. The $8.7 billion includes $8.3 billion from MDOT and $400 million in locally pledged funds (BRTB, 2007).

Expansion funding includes three main categories of expenditures: highways and interchanges, transit, and other, which includes transportation demand management programs, bicycle and pedestrian projects, and maintenance and operations for new projects. Highways and interchanges receive $6 billion or approximately 69% of the expansion budget while bicycle and pedestrian projects are allocated a mere 1%, approximately $62 million, of the total expansion budget. Figure C-5 provides a graphic of the allocation of the expansion budget.

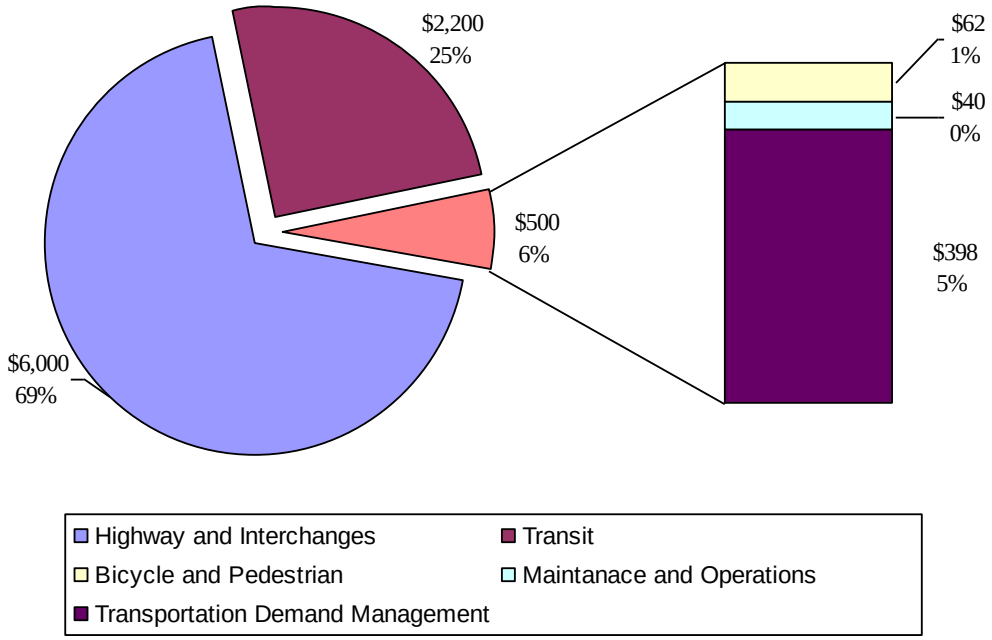

Figure C-5. Transportation Outlook 2035 Expansion Budget Allocation by Category (dollars shown in millions)

The bicycle/pedestrian *Action Plan 2001* devotes chapter 10 to funding sources, identifying federal, state, local, and private sources of funding. The plan specifically mentions the importance of TEA-21, ISTEA's successor and surface

transportation plan in effect in 2001, in making over $217 Billion in federal gas-tax and other funds available for transportation improvements; the plan notes that over half of this money is available through programs that include bicycling and walking projects as eligible expenditures. The plan also notes numerous state funding sources, some specific to bicycle and pedestrian improvements and others that can be used to finance specific enhancements (Sprinkle Consulting, 2001). The plan also details common local approaches – bond issues, local sales taxes, annual capital improvement dollars – to acquiring funding for bicycle and pedestrian improvements as well as several private grant programs and the possibility of corporate sponsors to fund specific improvements (Sprinkle Consulting, 2001).

Project Selection

After outlining regional goals and forecasting socio-economics demographics, the first step in the planning process is to determine regionally significant projects; these are the projects that are critically important to all jurisdictions in the region. Once these projects are decided, local jurisdictions may submit their preferred projects for inclusion in the region's LRTP, including highway, transit, bicycle and pedestrian, and management and operations projects. Since the LRTP is required to be fiscally constrained, projects must be selected and prioritized. Projects are prioritized using a methodology that considers both policy and technical aspects of the projects. Once a project is evaluated on these criteria categories, it is given a combined score that helps the BRTB make decisions about which projects to include in the LRTP given the financial constraints.

This policy prioritization process is a qualitative process that considers local and state priorities; it is supported by quantitative data and studies conducted by the BRTB. The policy evaluation counts for 60% of the final score and is conducted by the BRTB member jurisdiction that submits the project. The policy evaluation consists of three factors: (1) an assessment of the project relative to the seven evaluation criteria; (2) the project's rank, determined by the submitting jurisdiction, as High, Medium, or Low priority; and (3) the analysis of the project relative to the Maryland Department of Planning's PFAs; projects outside of PFAs lose five points from their final score. The seven evaluation criteria are provided in Table C-3 (BRTB, 2007).

Table C-3. BRTB Policy Evaluation Criteria, 2007

1	Improve Safety
2	Maximize Transportation System Management & Operations
3	Increase Accessibility & Mobility
4	Preserve the Environment
5	Improve Transportation System Security
6	Link Transportation investments to Land Use & Economic Development
7	Foster Inter-jurisdictional Participation & Cooperation

Technical prioritization is a quantitative process that counts for 40% of a project's final score; BMC staff completes this technical analysis. Three different categories of projects are defined within the technical evaluation: (1) highway and interchange projects, (2) rail transit projects, and (3) bicycle and pedestrian projects. The first two types of projects are evaluated based on seven criteria; bicycle and pedestrian projects are reviewed on the basis of four criteria, provided in Table C-4; three of the four criteria, demand, safety, and connectivity, used to evaluate bicycle and pedestrian projects overlap with the criteria used to assess highway and transit projects. Given the different number of criteria, when bicycle and pedestrian projects

are compared to other types of projects, the score is determined as a percentage of points earned relative to total points available. However, in the past two LRTP, all recommended bicycle and pedestrian plans have been included, meaning that there was no comparison of bicycle and pedestrian projects to highway and rail transit projects.

Table C-4. BRTB Technical Evaluation Criteria for Bicycle and Pedestrian Projects, 2007

Evaluation Category	Criteria	Meaning	Source	Point Values
Demand	Demand	Assess demand based on proximity to trip generators.	• 1999 BMC Bicycle Latent Demand Assessment Study • BMC Staff Analysis	0-40
Need	Connectivity	Assess the degree to which projects meet bicyclist and pedestrian needs.	• BMC Staff Analysis	0-25
Bike/Ped Stress Levels	Safety	Assess perceived bicyclist safety.	• 2004 BMC Bicycle Suitability Evaluation of Roadways • BMC Staff Analysis	0-25
Directness	Directness	Assess the difference between the length of proposed facility and the shortest existing route.	• BMC Staff Analysis	0-10
			Total Maximum Points:	100

Typically, output from the regional travel demand model or other studies is used to produce measures that correspond with each evaluation criterion, providing an objective measure or score for comparison (BRTB, 2007). The 'source' column of Table C-4 indicates how these measures are derived. For example, BRTB conducted a latent bicycle and pedestrian demand study based on attractors and generators of demand and supply, assigning each zone a relative score of 1 to 100; this score serves as the measure of pent up demand for bicycle and pedestrian facilities in an area and is used to compare projects on the Demand criterion. For

safety, the BRTB uses the average bicycle and pedestrian level of service score, which is, in part, the result of the 2004 BMC Bicycle Suitability Evaluation. Using such studies and models helps to minimize the subjectivity inherent in selecting transportation projects.

In addition to the policy and technical assessment, the BRTB, with assistance from the Maryland Department of Transportation (MDOT), reviews available funding through the length of the plan, 30 years. This step is critical to the planning process since LRTPs are required to be financially constrained.

Once a project is included in the LRTP, it typically will be included in the TIP for the year it is designated in the LRTP. However, since priorities, funding levels, and needs change, inclusion in the LRTP does not guarantee that a project will be included in the TIP. The regional bicycle and pedestrian plan identifies high priority bicycle and pedestrian projects that, linked together, would form a significant regional transportation network. However, as with the relationship between the LRTP and the TIP, projects in the regional bicycle and pedestrian plan (*Action Plan 2001*) are not necessarily included in the LRTP.

Travel Demand Forecasting Model

BRTB's endorsed a new travel demand model in the fall of 2006, Version 3.3. This new model, developed to meet the Federal Transit Authority requirements for a fixed guide way transit system analysis, is being used for all transportation planning in the Baltimore region. The updated model generates total person trips, motorized and non-motorized for the entire Baltimore region. Because of the proximity of Washington D.C. and the interaction between the two areas, the new model includes

the District of Columbia and Montgomery, Prince George's, and Frederick Counties, which are modeled for their transportation planning purposes by the Metropolitan Washington Council of Governments (MWCOG). They are included in the BRTB model because of the large commute shed of both Washington DC and Baltimore, meaning that many residents in one region commute to the other region for work.

The model is based upon Transportation Analysis Zones (TAZ). The entire modeled region (including the DC area) is divided into small geographic areas (generally corresponding to US Census block groups). However, the zones for the DC region are less well defined than those for Baltimore but are included because of the close connection between the two regions. The Baltimore region is divided into 1,151 zones; the entire modeled area contains 1,463 zones, an addition of 312 zones to cover the area connecting Baltimore and Washington D.C. The model requires inputs and produces results by zone (BMC, 2007b).

Inputs into the model include the zone structure, socio-demographic data by zone, transportation networks, such as the highway, transit, and downtown sidewalk networks, other network related data, and trip tables. Appendix One provides a complete list of model inputs (BMC, 2007b). According to the 2000 Validation report, the Version 3.3 model uses the standard four-step process of travel demand forecasting (BMC, 2007b). Non-motorized trips are derived from person trips by applying known data from a zone, such as auto- and transit-trips and auto-ownership, and certain assumptions based on area-type and household density. The non-motorized trip model is not sensitive to bicycle and pedestrian infrastructure; and relying on technical analysis to make decisions on CMAQ spending makes

justifying the use of CMAQ funds for bicycle and pedestrian project difficult for jurisdictions within the Baltimore region.

The model is typically used to model the impact of a package of proposed projects, such as a no build, programmed, and preferred alternative package. While the regional model has been used for specific projects such as Base Closures and Realignments, it is not set up to model the impact of individual projects (J. Bridges, personal communication, March 4, 2008). Despite this, by calculating volume to capacity (VC) ratios, the model can be used to highlight areas in need of attention (J. Bridges, personal communication, March 4, 2008).

Advisory Groups

BRTB has two advisory groups that can influence bicycle and pedestrian decisions, the Citizens Advisory Committee (CAC) and the Bicycle and Pedestrian Advisory Group. The CAC helps direct public involvement and serves as a forum for discussion of plans. The Committee is set up to represent a broad range of interests, by representing various transportation modes and geographic areas within the Baltimore region, and to promote awareness of the BRTB's plans and planning process. In addition to providing input on the LRTP, the CAC reviews the BRTB's proceedings, including bicycle and pedestrian activities (J. Bridges, personal communication, December 11, 2007). The CAC represents bicycle and pedestrian interests to the extent that its members have interest in these transportation modes. Currently, the CAC includes members of the Maryland Pedestrian and Bicycle Advisory Committee as well as a number of transit-focused members who

understand the connection between the non-motorized and transit modes (J. Bridges, personal communication, December 11, 2007).

In addition to the CAC, BRTB houses a Bicycle and Pedestrian Advisory Group. The advisory group helps develop the regional bicycle and pedestrian plan, provides technical assistance to the BRTB and its members, and collaborates with federal, state, and local agencies on bicycle and pedestrian issues. The group also promotes bicycle and pedestrian events and programs throughout the region. The advisory group includes a representative from each member jurisdiction, typically the person in charge, or interested in, bicycle and pedestrian planning, as well as the Maryland Departments of Environment, Transportation, and Planning (J. Bridges, personal communication, December 11, 2007). These two committees provide input and review of projects for the LRTP and the Bicycle and Pedestrian plan. The BRTB does not have a dedicated Bicycle and Pedestrian Coordinator or Planner.

6. Bicycle and Pedestrian Projects

Between 1991-2000, there were over 100 bicycle and pedestrian projects in the Baltimore region ranging from the streetscape projects to sidewalks to multi-use trails. Table C-5 shows the breakdown of projects by project type.

Category	Number of Projects	Category	Number of Projects
Streetscape	34	Trail	13
Bike/Ped Path	6	Pedestrian tunnel	1
Path	1	Pedestrian Improvement	1
Traffic Calming	1	Sidewalk	46

Table C-5. Breakdown of bike/ped projects by project type in the Baltimore region, 1991-2006

Bicycle and pedestrian spending in the Baltimore region varied considerably by county. (See Figure C-6.) For example, total spending (including federal, state, and local funds) in Baltimore County was more than 93 times total spending in Howard County. Table C-6 contains detailed information on spending by county. Similarly, spending per capita on bike/ped projects varied considerably for the different counties within the Baltimore region. On the low end, Howard County spent an average of $0.77 per capita on bike/ped projects between 1991 and 2000; Baltimore County, which has the highest total and per capita spending in the region, spent an average of $23.49 per capita. Anne Arundel County, home to Annapolis, also spent a relatively larger amount on bicycle and pedestrian projects: $15.79 per capita.

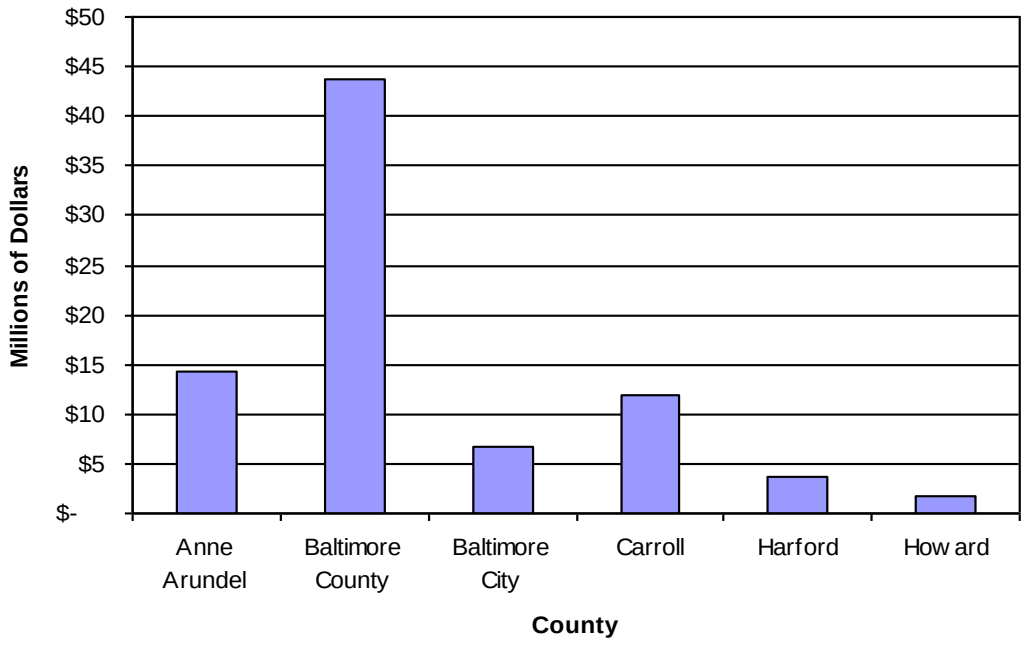

Figure C-6. Spending on Bicycle and Pedestrian Projects by County

Table C-6. Total Funding for Bicycle and Pedestrian Projects BRTB region, 1991-2000

County	Bicycle/ Pedestrian Spending by Jurisdiction* (in 000s)	County share of Region	2000 Population	Annual Spending per Capita
Anne Arundel	$14,221	17.4%	489,656	$3.23
Baltimore County	$43,828	53.5%	754,292	$6.46
Baltimore City	$6,604	8.1%	651,154	$1.13
Carroll	$11,890	14.5%	150,897	$8.76
Harford	$3,600	4.4%	218,590	$1.83
Howard	$1,709	2.1%	247,842	$0.77
Region Total	$81,852	100%	2,512,431	$3.62

7. Influences

Three areas provide important influence on bicycle and pedestrian planning and project implementation: state and regional policies, advocates, and federal funding. This case study has already reviewed the state's bicycle and pedestrian related legislation and resources. While these appear to be significant, it is interesting to note that most local jurisdictions maintain that the state has little impact on local bicycle and pedestrian planning. Most felt that the state did little to support their efforts. There is a perception that the state bicycle and pedestrian program focuses on state highways and not on helping local jurisdictions. More assistance comes from the BMC than from the state. The BMC provides a much-needed forum for encouraging bicycle and pedestrian planning, for identifying regional needs, and coordinating regional programs and trails. The BMC also provides significant educational opportunities for local staff. Membership on the BRTB Bicycle and Pedestrian Committee is often the only formal link local staff have to bicycle and pedestrian activities.

One Less Car, a Baltimore based advocacy group established in 1999, is the primary bicycle and pedestrian advocacy organization in the Baltimore region; their emphasis appears to be on state level policy. While some of the local jurisdictions noted that advocates play a role on a project by project basis, none felt that advocacy organizations were systematic in their efforts or were responsible for the current state of bicycle and pedestrian planning in the community. However, the importance of individual biking and walking advocates was noted. In most jurisdictions, bicycle and pedestrian advocates are used to help identify needed improvements and possible locations for bicycle and pedestrian facilities. The role of advocacy groups appears to be stronger in Baltimore and Annapolis where they serve on the bicycle and pedestrian commissions and helped to develop the bicycle and pedestrian plans.

Finally, given the magnitude of federal funding relative to other sources, its availability should be a significant influence on bicycle and pedestrian projects. While there are several other sources of funding for bicycle and pedestrian improvements that are quite substantial, such as CMAQ, planners in every jurisdiction specifically mentioned TE funds but not these other sources. They also noted that attaining federal funding for independent bicycle and pedestrian projects can be challenging, and they often do not go after TE funds for this reason. Nevertheless, they all acknowledge that federal funding is *the* reason that many projects have been completed. Obviously, the availability of federal transportation funds is important and many projects are funded through the BTRB TIP and some

through TE funds. Yet, other sources of federal funds appear to be underutilized due to both state and federal program requirements.

No one discounted the importance of ISTEA in garnering attention for non-motorized forms of transportation. ISTEA helped shape state level policy and resulted in a change in political will, especially at the state level; ISTEA is the reason why the BMC Bicycle and Pedestrian Working Group formed and brought about the changes in state policy that allowed sidewalks to be built on state roads. It was the first step in recognizing bicycling and walking as valid transportation modes, not as recreation. As Jamie Bridges of the BMC commented: “It would be a huge change if we could just get everyone to understand that [bicycle and walking are valid modes of transportation]” (personal communication, December 11, 2007).

8. Ongoing Challenges

Implementing bicycle and pedestrian projects remains challenging in the Baltimore region. In interviews of local, regional, and state level staff, the challenges ranged from commentary on the nature of development in auto-dependent, suburban America to uncertainty regarding how and where to start adding facilities to the challenges imposed due to the street ownership structure in Maryland. Some of the more commonly cited challenges are described below.

Eight of the 10 people interviewed noted *a lack of public awareness and/or political support* as a significant barrier to facility expansion, making it the most commonly cited impediment. This challenge is related to the second most commonly noted obstacle: *funding.* Public awareness, political will, and financial support go hand in hand. Lacking public support and awareness there will be not political will;

without political will most jurisdictions will neither place a high priority on bicycle and pedestrian accommodation nor provide the funding needed to tackle implementing a network of facilities; this is true despite the increased availability of federal funding since ISTEA. The second-most common barrier interviewees noted is that Maryland's 50/50 TE matching policy, the complexity of the TE application process, and the increased costs associated with using federal funding (such as expanded environmental requirements) made using federal funds, such as those made available by ISTEA, unattractive.

Implementing plans and retrofitting roadways proved to be the third most commonly noted challenge. Informants felt that retrofitting existing streets is not only expensive but sometimes nearly impossible. For example, the street networks in Baltimore and Annapolis were originally designed in the seventeenth century and must have on-street parking; while these streets generally have sidewalks, there simply is not room for bicycle lanes. Accommodating non-motorized modes is difficult on other streets because of lack of right of way, the speed and volume of traffic, or the rural surroundings of the roadway. There are numerous impediments to adding bicycle and pedestrian facilities to existing roads. While there are potentially many ways to improve or add bicycle and pedestrian facilities on existing roads without expanding road widths, planners in the Baltimore region felt that retrofitting existing roadways was a significant challenge facing bicycle and pedestrian improvements. Further, to the extent that easier projects are undertaken first, adding facilities to existing roads becomes increasing difficult.

Fourth, interviewees cited *the variety of needs among bicycle and pedestrian facility users*, especially among bicyclists, which results in a fragmented advocacy movement. Generally, even where advocacy groups are strong, in Baltimore and Annapolis, there appears to be lack of cohesion in the arguments of the various organizations. Bicycle advocacy is divided between those who advocate for multi-use paths adjacent to roadways or in former rail beds and those who advocate for cyclists to be treated with the same rights and accommodations as automobile drivers. These two groups demand significantly different facilities and, thus, divide the attention given the bicycling between recreation and transportation. In many jurisdictions, bicycle and pedestrian facilities still appear to be considered recreational despite being in the transportation plan; several interviewees suggested speaking with the parks and recreation department for additional information.

Finally, several people recommended that all jurisdictions with authority over road construction and maintenance need to *implement a routine accommodation policy*. Routine accommodation is nothing more than requiring that planners and engineers design all transportation projects to accommodate bicyclists; recently the expanded concept of ‘complete streets,’ which includes pedestrians, transit vehicles and riders as well as road users of all ages and abilities.

9. Conclusion

As a high growth area that does not conform to federal air quality standards, the Baltimore region could benefit from increasing use of non-motorized modes of transportation. They offer a chance to reduce highway demand and congestion, mitigate environmental concerns, and improve overall health and quality of life.

Nevertheless, because of the many factors discussed above, the region as a whole has yet to take advantage of some of the opportunities presented by ISTEA.

Nevertheless, ISTEA has had an impact on regional planning both through the changes in federal funding available and through changes in state level policy that the legislation inspired. Since 1991, the state of Maryland has implemented Smart Growth policies that focus on building walkable, bikeable communities in Maryland; the General Assembly has passed legislation requiring bicycle and pedestrian planning, created a staff position and an advisory group to monitor and advise the state on bicycle and pedestrian policy, and conducted an inventory of roads that need for improvement in order to be safe for bicycle and pedestrian activity.

New federal and state policies have inspired regional and local changes. Prior to ISTEA, the Baltimore region's LRTP did not even mention the bicycle and pedestrian modes of transportation; every LRTP since 1991 has included a substantial non-motorized mode discussion and project list. While some of the local jurisdictions in the region are just beginning to plan for bicycles and pedestrians, the BRTB is advocating for planning and attempting to coordinate local plans through its Bicycle and Pedestrian Advisory Group and its regional bicycle, pedestrian, and greenway plan, *Action Plan 2001.*

Most planners in the region noted that building bicycle and pedestrian facilities is challenging for many reasons, including limited funding in the face of a 50/50 matching requirement for TE funds, a lack of political will to spend local money on bicycle and pedestrian projects, and difficult applications and project

requirements when using federal funds. Those challenges notwithstanding, thanks in part to ISTEA, the region is aware of the benefits of non-motorized modes of transportation and increasingly focused on promoting bicycling and walking as viable modes of transportation.

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