



# Moving from planning to action: Exploring best practice policy in the finance of local bicycling and pedestrian improvements



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## ABSTRACT

In the face of diminished federal and state transportation funding, cities continue to look for creative local funding mechanisms to pay for and implement their multi-modal goals. To understand the types of local funding being used, this study analyzes case study cities across the U.S. to identify best practices, documenting the most widely used methods of funding. We find that county sales tax measures are most common but that additional popular approaches are bond issues, general fund allocations, and transportation impact fees, especially for larger cities. More-so, all of the cities evaluated have both bicycle and pedestrian masterplans to guide infrastructure investments and most pursue more than one local funding source to fund projects. This provides important lessons to communities that desire to improve the local bicycle and pedestrian amenities – the best practice to move from policy to action. © 2016 World Conference on Transport Research Society. Published by Elsevier Ltd. All rights reserved.

## 1. Introduction

As many international planning and design policies transition to focus on livability, many cities have begun to shift their design and engineering standards to support multi-modal streetscapes. However, many such cities face funding shortfalls due to a variety of factors. As a result, local communities are often left to compete with one another for available national or regional funding. As such sources become less abundant, communities need alternative approaches to finance bicycle and pedestrian projects in a way that allow for them to be implemented in a reasonable timeframe.

This study analyzes best practice in the US, evaluating cities that seem to be best turning bicycle and pedestrian policy in to infrastructure—with the hypothesis that local self-help funding and property tax measures are becoming increasingly important in operationalizing bicycle and pedestrian plans. This is based on literature that points to a ‘quiet revolution’ in the local funding of such efforts, and how they may be increasing the number of bicycle and pedestrian projects that are implemented (Goldman and Wachs, 2003).

We use a qualitative approach that takes on a thorough review of funding sources, funding dollar amounts, community census

data, bicycle and/or pedestrian master plans, project implementation framework, and responsible staff from the list of top-ranking bicycle and pedestrian friendly cities. Using these cities as case studies, this examination attempts to analyze how different types of communities are funding bicycle and pedestrian improvements. Based on this evaluation lessons are derived to evaluate how leaders can make their cities more safe and accessible for bicyclists and pedestrians.

## 2. Background

Before evaluating case studies, we survey the literature on transportation finance in the context of changing street standards from more traditional transportation design (Southworth and Ben-Joseph, 1995) to those that support active transportation (Handy et al., 2005; Saelens et al., 2003) and safety for cyclists and pedestrians – methods to design streets to avoid delay for all users (Dowling et al., 2008; Elias, 2011). This is framed not only by the proposition that funneling federal funding to regions can boost the number of bicycle-related projects (Cradock et al., 2009; Handy and McCann, 2010) but by a lack of reduction in gas tax in most locations, which “provides insufficient funds to cover current transportation spending (Laing, 2013).” With less gas tax money available to pay for projects, and with constitutional restrictions in some states on the allocation of that money, local communities face stiffer competition when competing with one another for

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available state dollars to fund bicycle and streetscape infrastructure, and even those such as San Francisco, which has a sales tax measure, have reported gaps in funding (Coté, 2013). With crumbling public infrastructure, communities look to alternate sources to find the money necessary to fund the implementation of planned alternative infrastructure.

### 2.1. US federal funding

The surface transportation system in the United States is funded by a transportation bill that distributes billions of dollars annually to states for capital improvements and maintenance for roads, transit, and bicycle and pedestrian facilities (de Zeeuw and Flusche, 2011). The current bill that funds surface transportation is the Moving Ahead for Progress in the 21st Century Act (MAP-21), which was signed into law by President Obama on July 6, 2012. MAP-21 supplies approximately \$105 billion in funding for surface transportation for fiscal year (FY) 2012 and FY 2013, and is the first long-term highway authorization enacted since 2005 (U.S. Department of Transportation, 2013).

Federal funding is allocated to bicycle and pedestrian related projects through key federal programs: the Surface Transportation Program (STP), the Congestion Mitigation and Air Quality Program (CMAQ), the Transportation Alternatives Program (TAP), and the Highway Safety Improvement Program (HSIP). While each program has different stipulations, each also has the capacity to allow for funding of bicycle, pedestrian and streetscape projects. Federal funds are distributed regionally through Metropolitan Planning Organizations.

STP funding can be used by states and localities on projects that preserve and improve the conditions and performance for pedestrian and bicycle infrastructure. 50% of the funds are required to be distributed to areas based on population: urbanized areas with population greater than 200,000, areas with population greater than 5000 but no more than 200,000, areas with population of 5000 or less. The remaining 50% can be used in any area of the state (Surface Transportation Program, 2013). Eligible projects can include: bicycle transportation and pedestrian walkways and ADA sidewalk modification, transportation alternatives, and recreational trails projects.

CMAQ was initially created by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, and has been reauthorized in all subsequent surface transportation acts, including MAP-21 (Federal Highway Administration, 2013). Previous surface transportation act “funding apportionments for each state were calculated based on a formula for weighted populations” in areas that have excessive ozone and carbon monoxide (CO), and are considered areas that either do not meet clean air standards (nonattainment) or have not met clean air standards in the past (maintenance areas) under the Clean Air Act. Under MAP-21, funding apportionments are no longer calculated based on a formula. However states are expected to utilize the equivalent of 25% of their funding to target fine particle particulate matter (PM2.5) reductions in their nonattainment or maintenance areas.

Additionally, FY 2013 and FY 2014 funding is based on FY 2009 funding, which utilized the formula for weighted populations. As a result, each state continues to receive minimum funding allocations based on those FY 2009 apportionments. With MAP-21, states also have increased spending flexibility. With the exception of the 25% set aside for PM2.5 nonattainment or maintenance, a state has the flexibility to spend the CMAQ funding on any project that meets basic criteria. CMAQ apportionments can be used to fund “new or expanded transportation projects that reduce emissions”. As a result, this funding program allows flexibility in the types of capital projects to be funded. In addition to other types of projects, CMAQ can fund travel demand management strategies, traffic

flow/management improvements, and bicycle and pedestrian facilities (Sacramento County Department of Transportation, 2013).

TAP funding is new as of FY 2013, and consolidates previous funding from pre-MAP-21 programs including Transportation Enhancements, Recreational Trails, Safe Routes to School, and several other discretionary programs, wrapping them into a single funding source. It allocates 2% of the total amount authorized from the Highway Account of the Highway Trust Fund for federal highways each fiscal year (Federal Highway Administration, 2013). A state may transfer up to 50% of TAP funds for use statewide to the National Highway Performance Program (NHPP), STP, HSIP, CMAQ, and/or Metropolitan Planning. Projects or activities can qualify for TAP funding if they are related to surface transportation and a described transportation alternative; recreational trail program; safe routes to school program; or the plan, design or construction of roadways in the right-of-way of former interstate system routes or divided highways. As described by Title 23, United States Code, 2012, these types of projects or activities can involve the following:

- Construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation.
- Construction, planning, and design of infrastructure-related projects and systems that will provide safe routes for non-drivers, including children, older adults, and individuals with disabilities to access daily needs.
- Conversion and use of abandoned railroad corridors for trails for pedestrians, bicyclists, or other non-motorized transportation users.

HSIP replaced STP Safety in FY 2006 and can be used for non-infrastructure safety improvement programs. This funding can be used to improve bicycle and pedestrian facilities when they are tied to a candidate project that intends to correct or improve a hazardous road location or feature, or address a highway safety problem. The candidate project must provide documentation in the “form of crash experience, crash potential, crash rate or other data-supported means” (Federal Highway Administration, 2013). Stand-alone funding sources from previous surface transportation bills that have remaining money available, such as Surface Transportation Program set-aside for Transportation Enhancement Activities (STP TE) or Safe Routes to School (SRTS), continue to be distributed until the funding is exhausted.

### 2.2. Alternative funding sources

Different cities have found ways to fund their bicycle and pedestrian facilities though local option taxes, developer requirements, crowdsourcing, parklets policies and fees, and cordon pricing. Local option taxes are typically voter-approved, single-county sales taxes that are tied to legally binding expenditure plans (Goldman, 2005; Goldman and Wachs, 2003). In many states, they increasingly dominate transportation planning and finance. They have the ability to create opportunities for innovation by empowering interest groups and policy entrepreneurs to play more direct roles in transportation decision-making (Goldman et al., 2001). As a part of its Great Streets master plan, Austin, TX has developed streetscape design standards for its downtown core (City of Austin, 2012). Developers are required to implement these streetscape standards at their own cost, but can qualify for partial reimbursement. City of Austin reimbursement funds are from a 30% set aside of parking revenues collected in the Great Streets program boundary area.

### 3. Methodology

Provided this background this study uses a matrix evaluation to evaluate best practice in bicycle and pedestrian finance in cities judged to be high-performing by the Pedestrian and Bicycle Information Center (PBIC), and the League of American Bicyclists (LOAB). As part of this process, quantitative data were gathered from sources, including the number of plans, amount of bicycle facilities and financing strategies for each city. This involved analysis of the 36 US cities derived from those that were listed both as a “Walk Friendly Community” (WFC) by the PBIC, and as a “Bicycle Friendly Community” (BFC) by the LOAB.

The PBIC is funded by the Federal Highway Administration and housed within the University of North Carolina Safety Research Center. To become ranked as a WFC by the PBIC, a community must show a commitment to improving walkability and pedestrian safety through comprehensive programs, plans and policies (Pedestrian and Bicycle Information Center, 2010). The League of American Bicyclists is a national bicycle advocacy organization that seeks to provide leadership, help establish standards and best practice for bicycle facilities in the United States. To become ranked as a BFC by the LOAB, a community must be “one that welcomes cyclists with trails, bike lanes, share the road campaigns, organized rides, Bike to Work Day events and so much more”. Communities are evaluated based on how their “community encourages people to bike for transportation and recreation through the five E’s: engineering, education, encouragement, enforcement, and evaluation.

The 36 cities that were classified as both bicycle and pedestrian friendly represent 24 states. They have populations that range from 1351 (in Grand Marais, MN) to 1,526,006 (Philadelphia, PA); varied weather, political climates, racial make-up, and population

densities. Primary data were collected from these communities using information from The LOAB, Smart Growth America, the PBIC, the United States Census (2010), and the Federal Highway Administration.

After this cursory evaluation, trends were identified through in-depth review of government documents (Molenaar et al., 2013). This involved collecting additional primary data for case study cities from the most recently approved budget; capital improvement programs (CIP); financial plans; Comprehensive or General Plans; pedestrian, bicycle or streetscape master plans; and redevelopment and tax increment financing (TIF) district plans. City staff were not directly consulted. Scholarly articles, books, press articles, websites, theses or dissertations and other case studies were utilized as secondary data sources.

Cities meeting this criteria, 12 in total, were first broken into four city population size groups for evaluation: 1000–49,999; 50,000–99,999; 100,000–299,999; greater than or equal to 300,000. This size grouping was modeled after the Research Brief on America’s Cities (Hoene and Pagano, 2013), and included at least 2 cities in each cohort, as illustrated in Fig. 1. The cities were then ranked according to the criteria in Table 1 to narrow the list of cities and explore the best examples of ‘success’ at implementing facilities and evaluated in-depth. After this, the six (6) cities with the most diverse strategies were evaluated using an in-depth case analysis.

This case method was used to explore the tools used to finance and implement pedestrian, bicycle and streetscape infrastructure, with the hypothesis that local funding is of increasing importance in seeing on-the-ground improvements. These results are then discussed broadly and compared to other potential emerging strategies or international cases that may have application in the

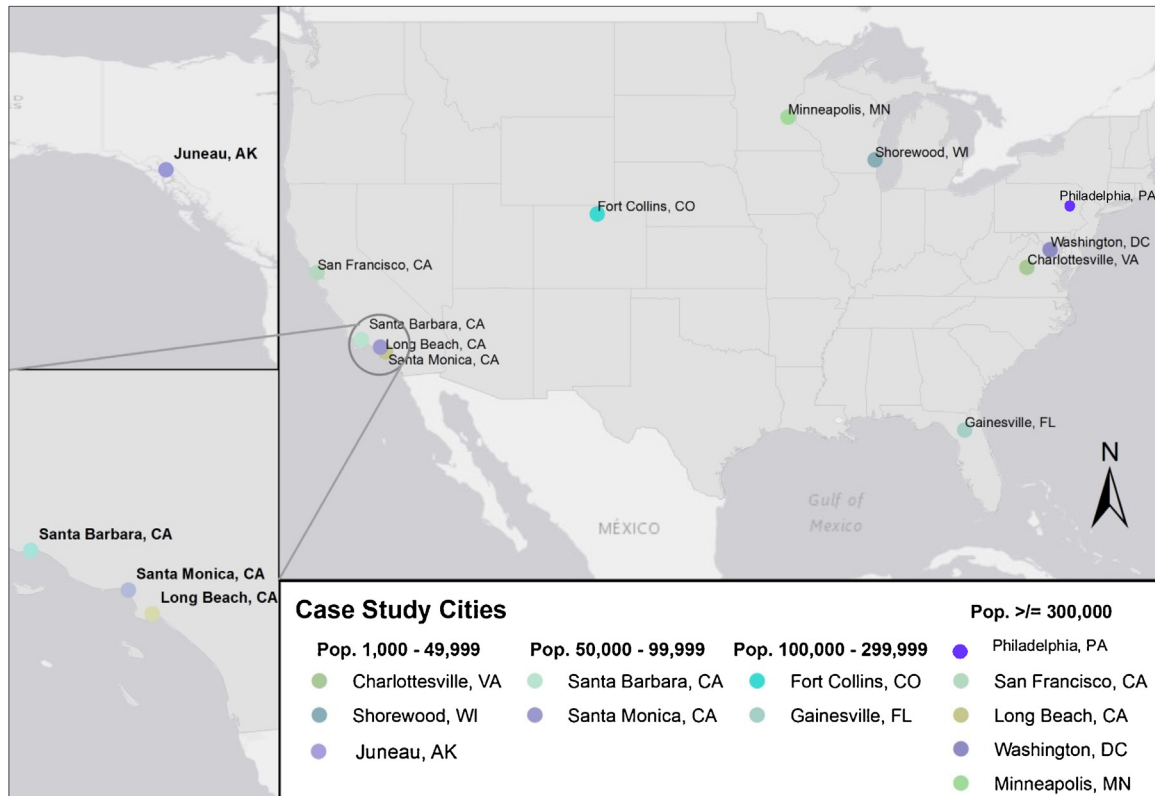


Fig. 1. Case study cities.

**Table 1**  
Case study selection criteria.

City Data	Value
Bicycle Master plan	Y <sup>a</sup>
Pedestrian Master plan	Y <sup>a</sup>
Pedestrian & Bike Needs addressed in Comprehensive Plans	Y
Complete Streets Plan (Local)	Y
Plan Funding Component	Y
% of Commuter Mode Share – Bicycle	>/=5%
% Commuter Modal Share – Walking	>/=5%
% Commuter Modal Share – Transit	>/=5%
% of Elementary Schools offering Bike Education	>50%
% of Middle Schools offering Bike Education	>50%
% of Arterial Streets with Bike Lanes	>50%

This is notated with an asterisk in the tables in the Supplemental Appendix.

<sup>a</sup> Joint bicycle and pedestrian plans are counted as having both a bicycle and pedestrian plan.

US and help increase the number of bicycle and pedestrian facilities.

#### 4. Results

Analysis of the initial 36 cities, ranging in size from 1351 (Grand Marais) to 1,526,006 (Philadelphia), revealed trends that helped to identify cities that stood out as practice leaders in the implementation of bicycle and pedestrian infrastructure. These trends informed the methodology for choosing case study cities:

- All had a bicycle or pedestrian masterplan document; most had both in a single or in separate plans
- 19 had bicycle and/or pedestrian planning language incorporated into their general plan or comprehensive plan
- 20 had a local multimodal access or complete streets policy
- 10 had more than 90% of elementary schools offering bike education, and 16 had more than 51% of elementary schools offering bike education
- 11 had more than 90% of middle schools offering bike education
- 13 had around 25% of arterial streets with dedicated bicycle lanes, and 10 had 26–50% of arterial streets with dedicated bicycle lanes.

The raw scores for these 36 cities are provided in the appendix. On the whole, as above, a key similarity for all of the cities is that every city had a robust plan or set of plans to rely on and develop complete streets projects; the policy being the precursor to the project. Twelve (12) of the highest scoring cities were selected for in-depth case analysis of the methods that had been used to implement pedestrian, bicycle and streetscape infrastructure. These cities were chosen based on how they represented the criteria in Table 1, indicating their level of commitment to facilities, financing, and planning. They stood out for their high number of implemented policy, budget measures, existing modal share, Safe Routes to School Programming, and percentage of arterial streets with bicycle lanes.

For the population size category 1000–49,999, the City and Borough of Juneau scored a total of eight out of twelve points due to its strong balance of policy and funding documents, commuter mode share, and provision of bike education. To more fully understand this population size category, the study also included case studies for the cities with the second highest scores; Charlottesville, VA, and Shorewood, WI. For the population size category 50,000–99,999, the City of Santa Barbara scored a total of ten out of twelve points due to a high number of policy documents. The second highest scoring city in that category; Santa Monica, CA, was also included in the case studies section. In the cohort for cities from 100,000–299,999 in size, Fort Collins, Colorado, Gainesville,

Florida were analyzed. Finally, of cities with a population greater than 300,000, Long Beach, California, Minneapolis, Minnesota, Philadelphia, Pennsylvania, San Francisco, California and Washington, D.C.

The top two case studies in each area are discussed in this article. They are illustrative of the creative local funding mechanisms utilized to achieve these bicycle and pedestrian infrastructure goals. Many of these case studies also identified not only continued shortfalls but creative solutions these are presented in the discussion alongside other non-US cases that may offer additional lessons for future funding.

##### 4.1. Charlottesville, Virginia

For cities with the population size between 1000 and 49,999, Charlottesville, Virginia stood out for having important policy and funding in place, as well as a higher than average modal share for walking and transit, and a higher than average percentage of Safe Routes to School programming implemented. Charlottesville is ranked by the LOAB as a Silver Community, and it is considered a Gold Level Walk Friendly Community by the PBIC.

The Charlottesville City Council has a stated vision and commitment to a connected community, which is ‘part of a comprehensive, regional transportation system that enables citizens of all ages and incomes to easily navigate [the] community. An efficient and convenient transit system supports mixed use development along [the] commercial corridors, while bike and pedestrian trail systems, sidewalks, and crosswalks enhance [the] residential neighborhoods. A regional network of connector roads helps to ensure that residential neighborhood streets remain safe and are not overburdened with cut-through traffic (City of Charlottesville, 2013a).’ Their comprehensive plan received an extensive update in 2013, and incorporates an emphasis on a transportation system that supports a safe, livable community through sustainable land use patterns and a multimodal transportation network. The plan also identifies the need to extend their sidewalk network across city-county boundaries and complete their bicycle network.

##### 4.1.1. Funding

In terms of funding, the City’s general fund allocates 3% annually to the Capital Improvement Program Fund, but does not otherwise earmark funding towards pedestrian and bicycle projects. That said, the (FY) 2014 budget allocated 40% of the capital improvement program funds towards sidewalk installation and repair, streetscape projects, and bicycle infrastructure (City of Charlottesville, 2013b, 2013c). The Pedestrian and Bicycle Master plan identifies public/private partnerships as a funding source to complete identified projects, but the City does not have available documents online which outline the implementation of this type of funding. The small area plans also emphasize public/private partnerships as key funding resources.

##### 4.2. Juneau, Alaska

The City and Borough of Juneau stood out for having important policy and funding in place, as well as a higher than average modal share for walking and transit, and a higher than average percentage of Safe Routes to School programming implemented. Juneau is ranked by the LOAB as a Bronze Community, and it is considered an Honorable Mention Walk Friendly Community by the PBIC.

The City and Borough of Juneau adopted a Non-Motorized Transportation Plan (NMTP) on November 2, 2009. This plan updated the 1997 NMTP and incorporates Complete Streets policy and design fundamentals (City and Borough of Juneau, 2009). Policy 3 of the NMTP states in part that ‘Project managers will use a



context sensitive approach in the design of City projects to achieve a Complete Streets network". The plan updated the 1997 plan, and provides a straight-forward implementation plan that identifies top project priorities which address bike route and sidewalk infrastructure connectivity and safety. The Non-Motorized Transportation Plan identifies prioritization criteria, giving highest scores to proximity to community destination, maximum potential residential density, annual daily traffic count, and proximity to accidents. It also defines policies designed to streamline infrastructure implementation, such as:

- Ready to fund – defining concept plans, budgets and project scopes for prioritized projects to put the City in the position of being able to take advantage of funding as it becomes available.
- State Projects – Work with state DOT to exercise input early in the state project design process to generate mutually beneficial expectations and timing of road project reviews.
- Municipal Projects – Improve timing of inter-agency review to reduce extensive redesign and delay.
- Private Sector Development – Review design standards to provide ways to make subdivision design more context sensitive.
- Transportation Planning – Complete motorized and non-motorized planning, design and construction together.
- Cross Juneau Bikeway – Complete missing segments in cross Juneau bikeway to provide a safe and direct route across town and between neighborhoods, which will encourage non-motorized commuting.

#### 4.2.1. Funding

Although Juneau remains reliant on a mixture of federal, state and local funding, they focus a large component of capital improvements funds and on local funding measures including a sales tax measure, a marine passenger fee and developer in-lieu fees. One percent (1%) of the sales tax levy (approximately \$8.0 million), through June 30, 2017, is allocated towards funding "repair and construction of streets, sidewalks, retaining walls, drainages, and stairway capital projects" (City and Borough of Juneau, 2013). Furthermore they are partially funding a trail along the coast (seawalk) with a Marine Passenger Fee, imposed on each cruise ship passenger that comes through (City and Borough of Juneau, Alaska, 2000). Furthermore an October 2005 ordinance requires developers either construct their portion of the seawalk during the construction phase of their development, or pay the City and Borough in lieu fees equal to twenty percent of the final seawalk construction costs for the segment abutting their property (City and Borough of Juneau, 2005).

#### 4.3. Santa Barbara, California

Of the case study cities the City of Santa Barbara stood out for having excellent coverage in policy, funding, and Safe Routes to School programming. The City has developed extensive policy documents that deal with both pedestrian and bicyclist concerns. As implementation tools of the City's Circulation Element, the City developed a Pedestrian Master Plan and a Bicycle Master Plan. The Pedestrian Master Plan was updated in April 2006, and the Bicycle Master Plan was most recently updated in 2008 (City of Santa Barbara, 2013). The City's Circulation Element also acts as its Complete Streets Policy, as it is in compliance with the California Complete Streets Act of 2008. Santa Barbara is ranked by the LOAB as a Silver Community, and it is considered a Gold Level Walk Friendly Community by the PBIC. From a funding standpoint, the City of Santa Barbara relies heavily on funding from Measure A, the 1/2 cent sales tax approved by Santa Barbara County voters in November 2008, which is in effect from April 1, 2010 until March

31, 2040 (Santa Barbara County Association of Governments, 2014; Santa Barbara County Local Transportation Authority, 2012). The City uses funds generated by Measure A for a variety of transportation projects including pedestrian and bicycle facilities, support for local transit, local road improvements, and local street and sidewalk infill and maintenance programs. The Santa Barbara Council of Area Governments (SBCAG) oversees distribution of Measure A funds and the City of Santa Barbara is slated to roughly \$104M for local street and transportation improvements—10% of which is to be spent on alternative transportation projects focused on bicycle and pedestrian facilities. The City receives only limited funding from its general fund and capital improvement programs aside from items funded by Measure A, and has expressed a future design to use private funding or a public/private partnerships for bicycle and pedestrian facilities on or abutting property where new development (or redevelopment) is scheduled to occur.

#### 4.4. Santa Monica, California

Santa Monica had important policy and funding in place, as well as a higher than average modal share for walking, and percentage of Safe Routes to School programming implemented in middle schools and high schools. The City's Land Use and Circulation Element proposes "the creation of a multi-modal transportation system" with no additional vehicle trips during the commute peaks (City of Santa Monica, 2010). The City has a well-developed bicycle plan that contains project as well as funding opportunities (City of Santa Monica, 2011b). For each facility proposed in this plan, a street cross-section, road conditions, route descriptions, and conceptual construction cost estimate are provided for either the 5-year or 20-year cycle. Santa Monica is ranked by the LOAB as a Silver Community, and it is considered a Silver Level Walk Friendly Community by the PBIC.

##### 4.4.1. Funding

Santa Monica revenues for bicycle and pedestrian infrastructure rely primarily on what it classifies as 'special revenue funds, or revenues that are legally restricted to expenditures for specified purposes (City of Santa Monica, 2011a). Consistent with this the City has a Transportation Impact Fee (TIF) program that allows for impacts to be offset by paying a fund dedicated to alternative transport expenditures (City of Santa Monica, 2013). Similarly the City also benefits from a Los Angeles County voter approved Measure R—a half-cent sales tax to finance new transport projects (Metro, 2013). In Santa Monica, these funds help to pay for bikeway, pedestrian improvements and streetscapes as they relate to the expansion of the Metro Light Rail (EXPO Line) through downtown Santa Monica (Los Angeles County Metropolitan Transportation Authority, 2008).

#### 4.5. Fort Collins, Colorado

As a case study Fort Collins, Colorado has one of the most diverse funding portfolios despite the fact that it does not have higher bicycle and pedestrian commuter mode share. The City developed the 2010–11 Transportation Master Plan (TMP) in collaboration with the City Plan update, which connects numerous planning documents in an attempt to match projects to budgeting categories in order to achieve sustainability goals (City of Fort Collins, 2011). The City is a LOAB Platinum Community, and considered a Bronze Level Walk Friendly Community by the PBIC.

##### 4.5.1. Funding

In this context the general fund provides a non-fixed annual subsidy to transportation (City of Fort Collins, 2012). For FY2015, 21% of the total Transportation budget was subsidized by the

**Table 2**  
Existing local bicycle and pedestrian funding mechanisms by local funding mechanism.

City, STATE	Population (2010 Census)	County Sales Tax Measure	Bond Issues	General Fund	Transportation Impact Fees	Tax Increment Financing District	Developer In-Lieu Fees	Developer Agreements	Utility User Tax	Marine Passenger Fees	Re-development Agency	Capital Improvement Fund	Local Transportation Revenues
Shorewood, WI	13,162	No	Yes	No	No	Yes	No	No	No	No	No	No	No
Juneau, AK	31,275	Yes	No	No	No	No	Yes	No	No	Yes	No	No	No
Charlottesville, VA	43,475	No	Yes	Yes	No	No	No	No	No	No	No	Yes	No
Santa Barbara, CA	88,410	Yes	No	No	No	No	No	No	Yes	No	No	No	No
Santa Monica, CA	89,736	Yes	No	No	Yes	No	No	Yes	No	No	No	No	No
Gainesville, FL	124,354	No	No	Yes	Yes	Yes	No	No	No	No	No	No	No
Fort Collins, CO	143,986	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No
Minneapolis, MN	382,578	No	Yes	No	No	No	No	No	No	No	No	No	No
Long Beach, CA	462,257	Yes	No	No	Yes	No	No	No	No	No	No	No	No
Washington, DC	601,723	No	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes
San Francisco, CA	805,235	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No
Philadelphia, PA	1,526,000	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No
<b>Totals</b>		<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

general fund and in FY2016, 26% was subsidized by the general fund (City of Fort Collins, 2014b). In addition to this, Fort Collins has a history of using sales tax initiatives to pay for their infrastructure needs, most recently passing a Measure 2B – Keep Fort Collins Great, a \$0.85 percent sales tax of which 17% focused on alternative transportation (City of Fort Collins, 2014a). This is complimented by a transportation impact fee that is levied on projects as a part of the development process.

#### 4.6. Gainesville, Florida

Similar to Fort Collins, Gainesville, Florida is a highly ranked city (a Silver Community by the LOAB, and Bronze Level Walk Friendly Community by the PBIC), that uses a unique suite of tools to achieve project outcomes. The City relies heavily on regional government for long-range bicycle and pedestrian planning, but has a fairly progressive Transportation Mobility Element as a part of their Comprehensive Plan with substantive language discussing complete streets goals (City of Gainesville, 2013). The Transportation Mobility Element also includes multi-modal level of service (LOS) criteria, and establishes bicycle, pedestrian, and transit infrastructure and LOS requirements that must be met for each new development.

##### 4.6.1. Funding

Gainesville employs many of the strategies of other communities in funding bicycle and pedestrian facilities, but has the additional option of a local gas tax. While a small amount of funding comes from the general fund, the fund primarily provides the conduit for other sources of revenue including local sales tax and a local gas tax. This local gas tax is authorized by State law and must be used for transportation-related expenditures (City of Gainesville, 2002; Florida Department of Revenue, 2012). In addition to this unique tool, the City of Gainesville uses tax increment districts to fund infrastructure, especially in redevelopment areas, a Transportation Mobility Program Area Fee which is an impact fee which requires that developers to provide bicycle, pedestrian, and transit infrastructure and to meet LOS requirements or pay a fee, and a regional sales tax measure that expired in 2010 and has not been reauthorized (City of Gainesville, 2012; Clark, 2014).

#### 4.7. Long Beach, California

As a case study city greater than or equal to 300,000, Long Beach, California ranks by the LOAB as a Silver Community, and it is considered a Silver Level Walk Friendly Community by the PBIC. The Mobility element of the City's General Plan plans for complete streets (City of Long Beach, 2011, 2013c) and the City has a bicycle plan and is developing a pedestrian plan.

##### 4.7.1. Funding

The City of Long Beach general fund provides approximately 14% of the budget for repair and maintenance of streets and sidewalks (City of Long Beach, 2013b). This is complimented by the Capital Improvement Program (CIP) which contains many bicycle and pedestrian projects and stems from a variety of sources, including the regional Measure R, State and Federal funds. Revenue generated from the Transportation Mitigation Program (a development impact fee that assessed on commercial and residential development projects in the City) also provides CIP funds (City of Long Beach, 2013a, 2014). In addition to these tools the city also receives sales tax from Prop C, a Los Angeles County \$0.005 sales tax for construction, maintenance and improvement of mass transit services and facilities, or bikeways and streets improvements (Metro, 2011).

#### 4.8. Minneapolis, Minnesota

The City of Minneapolis, Minnesota, provides a case study of strong policy and funding capacity, good walking and transit commuter modal share and substantive participation at Safe Routes to School programming in Elementary schools. Minneapolis is ranked by the LOAB as a Gold Community, and it is considered a Gold Level Walk Friendly Community by the PBIC. The City has a suite of transportation plans called Access Minneapolis that set for bicycle and pedestrian planning goals (Access Minneapolis, 2011; City of Minneapolis, 2014c). The Bicycle Master Plan cites an increase in bikeway mileage in the city from 2000 to 2009 as contributing to a doubling in the bicycle commute work trips. A large component of this added mileage were Class-I trails and protected bikeways (City of Minneapolis, 2011, 2014a). The Pedestrian Master Plan sets goals to facilitate best practices which include better pedestrian network connectivity and pedestrian zone design. The plan also includes a parklet program to include environmental engagement (City of Minneapolis, 2009, 2014b).

##### 4.8.1. Funding

The City of Minneapolis does not receive direct general fund money for transportation, and funds most of its bicycle, pedestrian, and streetscape projects through a unique bonding program referred to as Net Debt Bonds (NDB) bundled with State, and Federal monies. NDB are property-tax supported bonds issued to finance general infrastructure improvements with the debt service paid by taxes collected annually (City of Minneapolis, 2013). These bonds are subject to a legal debt margin of 3.33% of assessed market value of each property. Additionally, the City has access to a sales tax funding meant to improve the outdoor and the arts, and has mentioned private and/or corporate donations to fund capital projects (although no projects have recently been funded using these means).

## 5. Discussion

As can be seen from the case studies there were a variety of tools used by municipalities of varying scale and geography. If the most widely used local funding mechanisms across all 12 case study cities are compared, as shown in Table 2 below, they reveal that reliance on funding from a county sales tax measures is a highly popular mechanism – used by 7 out of 12 cities studied. Bond issues were the second most widely used approach, used by 6 out of 12 cities—most used by larger cities but surprisingly also used by the smallest. General fund allocations and transportation impact

fees followed as the third most widely employed funding methods – used by 4 out of 12 cities studied.

This case study analysis suggests that even with extensive planning, policy, Safe Routes to School programming and higher than normal bicycle and pedestrian modal shares, many cities still struggle to find funding for their bicycle and pedestrian capital projects. Using general funds and even focusing on planning-related in-lieu fees are not as common as one would think. And without heavily augmenting state and federal funding sources with local sources, many projects languish. Review of each case study city's CIP had extensive bicycle and pedestrian infrastructure projects listed for funding, but these projects did not end up in the final budget due to lack of available funding. Or, many other projects in the CIP included a note that projects had submitted requests for federal and/or state funding and were awaiting results.

This is where the sales tax measures and bond issuances come in to play. In a majority of cases these funding measures filled in the gap where the CIP did not deliver funding. Most plans indicated that they provided consistent revenue streams, if planned conservatively to account for market ups and downs. In most cases the plans also indicated that the fees acted as a tool to capture the impacts of non-residents who also used streets. This factor draws significance to the noticeable absence of property tax measures as a tool for finance with the exception of Minneapolis. In the case of bonding, most cities felt that the ability to borrow against the consistent revenues for these taxes was an asset in securing funding for larger projects and corridors. However, on the whole most cities focused on revenue streams different than local tax measures solely born by the residents of the respective cities—likely because they are not the only users of local roads.

Particularly interesting in this aspect, were smaller cities. While most of the case cities were receiving federal and state funding for infrastructure projects, they also identified funding shortfalls, and the need to find additional creative, diverse and unique local funding approaches. As illustrated in Table 3, only two of the three small cities had one local funding mechanism in common—the use of bond issues to fund bicycle and pedestrian capital projects. This suggests that for small cities, local funding sources are likely unique to the needs of city and region. It also suggests that smaller cities may be more creative in pulling together multiple sources of funding for projects, but also may have more flexibility to adapt policy to their unique local needs (Table 4).

Analysis of the remainder of cities found common priorities similar to those identified for the smaller cities. These priorities included the need to complete bicycle and pedestrian networks, and the need to add corner ramps to make existing sidewalk networks ADA accessible. Secondary priorities, however, varied

**Table 3**  
Existing Local Bicycle and Pedestrian Funding Mechanisms by Population Group (Ratios).

Population size	1000–49,999	50,000–99,999	100,000–299,999	>=300,000
# of Case Study Cities	3	2	2	5
County Sales Tax Measure	1:3	2:2	1:2	3:5
General Fund	2:3	0:2	2:2	2:5
Transportation Impact Fees	0:3	1:2	2:2	1:5
Bond Issues	2:3	0:2	0:2	4:5
Tax Increment Financing District	1:3	0:2	1:2	0:5
Developer Agreements	0:3	1:2	0:2	0:5
Utility User Tax	1:3	1:2	0:2	0:5
Marine Passenger Fees	1:3	0:2	0:2	0:5
Developer In-Lieu Fees	1:3	0:2	0:2	1:5
Re-development Agency	0:3	0:2	0:2	1:5
Capital Improvement Fund	1:3	0:2	0:2	0:5
Local Transportation Revenues	0:3	0:2	0:2	2:5
Local Property Taxation	0:3	0:2	0:2	1:5

**Table 4**  
Small city existing local bicycle and pedestrian funding mechanisms.

City, STATE	Pop.	County Sales Tax Measure	General Fund	Bond Issues	Tax Increment Financing District	Marine Passenger Fees	Developer In-Lieu Fees	Capital Improve. Fund
Charlottesville, VA	43,475	No	Yes	Yes	No	No	No	Yes
Juneau, AK	31,275	Yes	No	No	No	Yes	Yes	No
Shorewood, WI	13,162	No	No	Yes	Yes	No	No	No
Totals		1	1	2	1	1	1	1

greatly. Bicycle and pedestrian projects in the two larger population categories benefited from connection to large inter-city or regional transit projects. All cities with a population larger than 50,000 were also concerned with solving issues of livability and congestion management by improving bicycle and pedestrian networks and environments.

It is also worth discussing that all of the 12 case study cities were future-forward. Each had an eye on future funding opportunities or emerging technology and how it might impact their ability to implement future projects. In that light most were considering private funding, such as the cities of Memphis, Denver and Christchurch (New Zealand) all using private crowdsourcing to fund and implement certain components of their bicycle infrastructure (Andersen, 2014; Anderson, 2013). Others cited use of the parklet model, to create appealing and creative streetscape features (City of San Francisco, 2013; Loukaitou-Sideris et al., 2012).

Likewise many of these plans referenced property-based measures used by Minneapolis despite the fact that they were not using them, and cited international examples such as London, Singapore, Stockholm, and Milan as well as Bogota and Seoul. London, Singapore, Stockholm, and Milan have had success using cordon pricing systems to reduce vehicle congestion related delay in their financial and urban centers (Broaddus, 2014; Broaddus et al., 2015; Liu et al., 2014; May et al., 2002). The City of London began charging private vehicles this type of fee to enter Central London on weekdays as of 2003 (Litman, 2006). In London, this pricing strategy has been combined with improvements to transit and improvements to safety and access for bicyclists and pedestrians. The result of this strategy is reduced congestion related delays in central city roadways during peak hours and a safer roadway environment for non-motorized travelers (Komanoff, 2013). London has also had success using fees collected from their cordon pricing system to pay for enhanced bicycle and pedestrian infrastructure. As of 2006/2007, approximately 3% of net revenues (\$4 million of \$137million in revenues) were spent on support for new pedestrian crossings and cycling initiatives (Transport for London, 2008).

In addition cities like Bogotá and Seoul may hold additional promise in revisiting the inherent value of property after transit improvements. Many plans continue to target value capture of increased property taxes after the installation of infrastructure—a factor that has been shown to be very significant with transit (Kang and Cervero, 2009; Munoz-Raskin, 2010) but remains to be seen for bike and pedestrian infrastructure. Literature does suggest a price premium but has not translated it to individual bicycle and pedestrian infrastructure project investments (Gilderbloom et al., 2015; Pivo, 2013; Pivo and Fisher, 2011). While this may account for some future revenue it could eventually be bundled with older strategies usually used for open space, where public right-of-way is deeded back to individual homeowners and the revenue used to provide a public resources (bike lanes or sidewalks) on that (now private) property (Hagman, 1964). Such a strategy could provide an

added twist on the value capture lessons from South America and Asia.

### 5.1. Future work

The analysis of these case studies also leaves room for future work as there are many lessons that likely can be learned by continued analysis. For example, the reliance on voter-approved funding mechanisms suggests the importance of the local nature of such funding where there is project transparency, strong and consistent communication with the public (including post-project implementation budget reviews and user feedback), and targeted project marketing. While many of the case study cities reviewed that had consistent, long-term support for bicycle and pedestrian projects also had regular and easy to read reporting, public-focused communication, and ample avenues for feedback, we did not focus in directly on this aspect of transparency and communication. More work should be done in this area—especially if funding becomes more privatized (as many plans predict).

Likewise, a targeted study that analyzed the longitudinal cross-pollination of these strategies would be useful, especially for some of our more ‘successful’ case study cities like Fort Collins, CO, San Francisco, CA and Santa Monica, CA. Future work should extend evaluation of funding trends to see if the use of sales tax measures and bond issues remain constant to larger group of municipalities. This expanded study would also help identify additional trends for some of the lesser-used funding approaches that materialized in evaluation of the 12 case study cities.

## 6. Conclusions

The analysis of the 12 case study cities across the United States revealed that cities are sharing common infrastructure needs and funding shortfalls. While the case study analysis did not find a common funding factor across all 12 cities, voter approved measures such as county sales tax measures and bond issues are the most heavily relied upon approaches to local source funding bicycle and pedestrian capital project implementation. Put succinctly, the cases reveal that for cities between 50,000 and 100,000 sales tax measures and developer agreements and user taxes are very important while for larger cities there is a more diverse portfolio of funding strategies. Cities between 100,000 and 300,000 tend to rely on general fund and transport impact fees, while large cities (>300 K) tend to focus on bond issues, likely as a result of their greater bonding capacity.

Almost all cities now rely on voter-approved measures, and the fact that voters are willing to approve local funding mechanisms for transportation illustrates a growing public awareness of the funding gap faced in their cities and counties. It also illustrates a willingness by the public to pay more for congestion relief, improved roadway surfaces and multi-modal transportation options to improve quality of life. This factor may be underscored by the many recent voter-approved measures across the US in



recent years (Davis, 2014), yet other tools may still be needed in the future.

There may be valuable lessons in roadway pricing and value capture from Europe, South America and Asia. These may hold promise if implemented in the US, and, the combination of these and other strategies will allow planners and policy makers to continue to achieve more bikable and walkable streets. Hopefully they can be used to provide creative and flexible financing solutions in funding constrained environments.

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## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.cstp.2016.06.004>.

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