NCHRP

SYNTHESIS 436

Local Policies and Practices That Support Safe Pedestrian Environments

A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

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TRANSPORTATION RESEARCH BOARD

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Research Council was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communication and cooperation with federal, state, and local governmental agencies, universities, and industry; its relationship to the National Research Council is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the National Research Council and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Research Council and the Transportation Research Board.

The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.

NOTICE

The project that is the subject of this report was a part of the National Cooperative Highway Research Program conducted by the Transportation Research Board with the approval of the Governing Board of the National Research Council. Such approval reflects the Governing Board's judgment that the program concerned is of national importance and appropriate with respect to both the purposes and resources of the National Research Council.

The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, the American Association of State Highway and Transportation Officials, or the Federal Highway Administration of the U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical committee according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

THE NATIONAL ACADEMIES
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The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. On the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

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The **Transportation Research Board** is one of six major divisions of the National Research Council. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied activities annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. **www.TRB.org**

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Cover figure: A woman pushes a baby stroller through a striped crosswalk from a bump-out curb. ADA compliant truncated dome tiles can be seen on the curb cut. The bike lane and vehicle in the traffic lane underscore the multi-modalism discussed throughout the report. *Photo credit:* Meguire Campbell, Brooklyn, NY.

Highway administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to highway administrators and engineers. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire highway community, the American Association of State Highway and Transportation Officials—through the mechanism of the National Cooperative Highway Research Program—authorized the Transportation Research Board to undertake a continuing study. This study, NCHRP Project 20-5, "Synthesis of Information Related to Highway Problems," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an NCHRP report series, *Synthesis of Highway Practice*.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

Many communities around the country have adopted regulatory, administrative, and financial practices designed to promote and fund safe pedestrian facilities and activities. The objective of this study is to document various tools and strategies used by municipalities to improve the safety, convenience, and accessibility of the pedestrian experience.

Information used in this study was acquired through a review of the literature and interviews with key staff in local agencies that have implemented practices designed to support pedestrian-friendly environments.

CONTENTS

Note: Many of the photographs, figures, and tables in this report have been converted from color to grayscale for printing.
The electronic version of the report (posted on the web at www.trb.org) retains the color versions.

LOCAL POLICIES AND PRACTICES THAT SUPPORT SAFE PEDESTRIAN ENVIRONMENTS

SUMMARY   Many communities are encouraging pedestrian transportation to improve public health and safety, reduce the public costs of private automobile travel, improve personal mobility, and create other economic benefits. Communities that have been most successful at providing pedestrian transportation options recognize that a safe and usable pedestrian environment requires more than meeting minimum standards. High-quality pedestrian environments are places where pedestrians are anticipated, encouraged, and will congregate. These communities have adopted new policies, ordinances, and guidelines to support land development patterns and streets that serve multiple transportation modes.

Creating attractive and safe pedestrian environments is often made more difficult by existing conditions created with little regard for pedestrian activity, as the second half of the 20th century was marked by the increased dominance of the automobile. Policies and practices focused on vehicle throughput—moving more vehicles through the system faster—often to the detriment of those who walk.

The objective of this synthesis is to document the regulatory, administrative, and financial tools used by communities to provide safe pedestrian environments. This report captures tools and strategies reported as effective in a range of contexts (e.g., geography, community size, weather, demographics, and regulatory requirements) and development conditions. Development conditions addressed include new and infill development, street reconstruction, and retrofitting.

It is important to note that transportation planning is not conducted in a vacuum and that the needs of pedestrians must be considered in the broader context of a transportation system that has many goals and responsibilities. This synthesis does not address the real-world complexities and trade-offs of balancing the needs of pedestrians with other modes, including automobiles, transit, freight, and bicycles. It should also be noted that while this synthesis documents practices undertaken by local governments to increase pedestrian safety and mobility, there are few objective data to support that the practices documented did improve pedestrian safety. And finally, this synthesis is not intended to offer recommendations or guidance on the selection of specific pedestrian safety measures.

The research approach for this synthesis featured two primary components: a literature review and telephone and in-person interviews with key staff in local agencies that have implemented practices designed to support pedestrian-friendly environments. This synthesis includes a state-of-the-practice overview of practices undertaken throughout the country in various settings.

Practices are presented in brief narratives that provide vignettes of their development and implementation and the players involved. Four case studies (New York City, New York; Charlotte, North Carolina; Minneapolis, Minnesota; and Olympia, Washington) are

presented to offer a detailed exploration of communities that have implemented various practices and how those practices are coordinated and interact.

The practices presented in this synthesis are categorized by (1) public right-of-way engineering and design guidelines; (2) architectural and urban design guidelines; (3) planning and land development regulations; (4) financing mechanisms; and (5) operations, maintenance, and enforcement measures. They represent diverse geographic and demographic conditions, and have applications for a range of development contexts including new and infill development, street reconstruction, and retrofit conditions. It should be noted that information pertaining to policies and practices implemented in rural communities (defined as communities of less than 5,000 residents and regions less than 50,000 residents) was difficult to gather. Policies and practices to support safe pedestrian environments in rural settings emerged as a future research need.

The synthesis finds the following:

- Support from high-ranking agency leaders and elected officials is often an important component of success. This support provides staff with guidance on priorities and can induce crucial cooperation and collaboration between agencies at different levels of government.
- Formal policy guidance also serves an important role. This guidance is delivered in comprehensive plans, action plans, policy statements, or other documents that provide departments and their staff with clear policy direction. Practices included in this synthesis were frequently developed under the direction of these guiding documents, which in some cases represented significant shifts in policy. Shifts in policy can be difficult to institutionalize, though, and formal policy guidance with the support of agency leadership can facilitate this change.
- Interagency cooperation can be critical. The pedestrian environment is composed of elements that are the purview of a wide range of fields and may fall under the jurisdiction of multiple administrative levels. Practices that support the creation of safe pedestrian environments often rely on the expertise, cooperation, and meaningful collaboration of diverse agencies. Barriers can arise when these agencies do not share philosophical perspectives on the role and value of pedestrians.
- Community outreach also demonstrates significant benefit for these practices. Some of the practices included in this synthesis are based on community-driven processes, while others require public input and consent. Often, public opposition to these practices was assuaged or avoided through meaningful outreach and participatory processes.

CHAPTER ONE

INTRODUCTION

BACKGROUND

Attractive and safe pedestrian environments provide numerous benefits. Increased pedestrian activity is linked to improved health and general well-being, reduced vehicle emissions and greenhouse gas production, improved air quality, reduced traffic congestion, and increased economic activity, as well as difficult-to-quantify quality-of-life benefits (Komanoff 1993; Prassas 1999; Centers for Disease Control 2011). Yet creating attractive and safe pedestrian environments is a complex challenge that relies on the delicate interplay between physical design and policy. The walking environment is affected by the quality of pedestrian facilities, roadway conditions, and land use patterns, as well as policy decisions that directly or indirectly affect the ability to fund, operate, and maintain that environment. The pedestrian environment can affect perceptions about walking and the acceptance of walking as a viable mode of transportation.

Many communities around the country have decided to adopt various regulatory, administrative, and financial practices designed to fund, require, and otherwise promote safer pedestrian facilities and activities. These practices have been packaged and branded under concepts such as livability, sustainability, complete streets, context-sensitive solutions, and other movements that promote comfortable access and travel for all users of a transportation system, including motorists, transit, bicyclists, and pedestrians.

PURPOSE

The objective of this synthesis is to document various practices that municipalities use to provide pedestrian-friendly environments. The synthesis captures practices and strategies that have been reported as effective in a range of contexts and development conditions. The following pages offer diverse examples of practices undertaken by communities around the country, all looking to improve the safety, convenience, comfort, and accessibility of the pedestrian experience.

This synthesis is intended to provide information to transportation professionals interested in exploring strategies to promote pedestrian safety and mobility. Through narrative descriptions of the development and implementa-

tion processes, it provides documentation of how practices have been implemented in various types of settings. Four case studies provide in-depth illustrations of how various practices can be implemented in a coordinated fashion, often aimed at different but complementary aspects of improving the pedestrian environment.

This synthesis is not intended to offer recommendations or guidance on the selection of specific pedestrian safety measures. Various documents and tools that offer such a function, including *PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System* (U.S. Department of Transportation 2004); *Guidance for Implementation of the AASHTO Strategic Highway Safety Plan. Volume 10: A Guide for Reducing Collisions Involving Pedestrians* (Zegeer et al. 2004); and *NCHRP Report 500 Volume 12: A Guide for Addressing Crashes at Signalized Intersections* (Antonucci et al. 2004).

METHODOLOGY

The research approach for this synthesis featured two primary components: a literature review and telephone/in-person interviews with key staff involved in the development or implementation of practices described as successful. The literature review included searching and reading professional journals and publications from the NHTSA, TRB), American Association of Retired Persons (AARP), APTA, and other organizations involved in transportation and pedestrian issues.

As practices that were described as successful were noted, additional targeted research was conducted to collect information on the development and implementation of these practices. Practices presented in this synthesis are distributed throughout the four AASHTO regions in communities of varying geographies and climates, and feature diversity among a collection of criteria including population size, demographics, and development conditions. Additionally, practices were sought that fit into five qualitative categories: (1) public right-of-way engineering and design guidelines; (2) architectural and urban design guidelines; (3) planning and land development regulations; (4) financing mechanisms; and (5) operations, maintenance, and enforcement issues.

Telephone, and in a few cases, in-person interviews were conducted with professionals involved in the development or implementation of these practices. Interview subjects were identified through contact information listed in existing literature and by calling agencies to ascertain the appropriate contact. After gauging ability and willingness to take part in an interview, subjects were provided with an Interview Preparation Guide that included background information on this research synthesis and provided sample questions to indicate the themes and topics of the interview. The Interview Preparation Guide is in Appendix B. Interviews focused primarily on process-oriented topics such as the goals and origin of the practice, as well as any challenges and keys to success for both the development of the practice and its implementation. Subjects were also asked about other practices that would add value to the research synthesis both in their communities and elsewhere. Interviews lasted approximately 30 minutes.

Documentation associated with the practices (plans, reports, brochures) was also reviewed and used in addition to the interviews to inform the practice narratives found in chapters two and three. These narratives offer vignettes that describe the context, development, and implementation of each practice. It should be noted that these narratives focus on the documentation of practices that aim to support safe pedestrian environments and discussion of how the needs of pedestrians are balanced with the needs of transit; private vehicles and freight are not the primary focus of these vignettes.

ORGANIZATION

This synthesis contains five chapters. Chapter one is the introduction. Chapter two includes a state-of-the-practice overview wherein a sample of practices is presented in implementation narratives that provide brief vignettes of how these practices were developed and implemented and the players involved. Chapter three presents four case studies to offer a detailed exploration of communities that have implemented various practices and how those practices are coordinated. Chapter four analyzes crosscutting and recurring themes regarding challenges, keys to success, and contextual variation among practices. Chapter five summarizes of key findings and recommendations for further research.

CHAPTER TWO

STATE OF PRACTICE IN THE INDUSTRY

PEDESTRIAN PRACTICE

General Trends

Starting in the 1990s, a sense grew within transportation agencies and communities at large that the dominant approaches to development and street design that had prevailed for the second half of the 20th century were creating an environment that restricted transportation choices and reduced safety for vulnerable road users such as pedestrians. Various schools of thought have emerged to address this issue under loosely defined headings such as livability and walkability, or as approaches to planning and design such as context-sensitive solutions (CSS), a collaborative approach to planning that involves stakeholders in determining appropriate safety, mobility, and infrastructure countermeasures.

Experimentation with and acceptance of these principles have helped to elevate awareness of pedestrian issues. The U.S.DOT secretary, Ray LaHood, has identified livability (defined as provision of more transportation choices, expansion of housing choices, improved economic competitiveness of neighborhoods, and emphasis on existing communities) as a key priority for transportation (Federal Highway Administration 2011). The emergence of livability priorities has helped further pedestrian-oriented practices by highlighting available funding and programs and by elevating the status of pedestrian issues in the national conversation.

In the past decade, as pedestrian-friendly philosophies have built momentum and transformed into mainstream approaches, they have largely coalesced around the Complete Streets movement. The Complete Streets philosophy requires planners and engineers to "routinely design and operate the entire right-of-way to enable safe access for all users, regardless of age, ability, or mode of transportation" (National Complete Streets Coalition 2011). The Complete Streets approach recognizes that design strategies can be self-enforcing—proactive and thoughtful design can induce cars to drive at slower speeds, or prevent dangerous conflicts between pedestrians, cyclists, and motorized vehicles.

A significant portion of the agencies that were researched and interviewed for this synthesis had adopted a Complete Streets policy, were in the process of drafting such a policy, were considering one, or had deliberately decided not to pursue one because those principles were already captured by existing policies. Many of the practices described in this synthesis are aligned with the Complete Streets philosophy in that they aim to place pedestrians on equal footing with other modes and bolster safety through thoughtful accommodation.

POLICIES AND PRACTICES

Communities across the country have undertaken practices to promote the creation of safe pedestrian environments. To assist in the documentation of these practices, the following section provides a sample of the ways in which communities have developed strategies for improving the safety, convenience, and comfort of the pedestrian environment.

Table 1 includes information on each of the practices documented in this research. The rightmost column indicates where in this synthesis further documentation can be found. Each of these practices is included in the supplementary table in Appendix A, which provides population and demographic information about the implementing community and is intended to shed light on the techniques that have demonstrated success in various contexts. A subset of these practices is presented later in implementation narratives that describe the development and implementation of each.

In recognition of the complex relationship among the many elements that define the pedestrian environment, this synthesis categorizes the practices it describes in five categories: (1) public right-of-way engineering and geometric design guidelines, (2) architectural and urban design guidelines, (3) planning and land development regulations, (4) financing mechanisms, and (5) operations, maintenance, and enforcement measures. Many of the practices could be classified in multiple categories (e.g., categories 1 and 5), but each practice has been classified in only one category in order to highlight a particular aspect of the practice.

IMPLEMENTATION

Communities at the municipal level are the central players involved in the implementation of these practices. Many state and federal programs support these activities, as well

TABLE 1

PEDESTRIAN POLICIES AND PRACTICES CONTAINED IN THIS REPORT

Policies and Practices	Category					Found on Page
	Public Right-of-Way Engineering and Geometric Design Guidelines	Architectural and Urban Design Guidelines	Planning and Land Development Regulations	Financing Mechanism	Operations, Maintenance and Enforcement Measures	
Berkeley, CA—Pedestrian Master Plan	x					Appendix A
Boston, MA—Complete Street Design Guidelines	x					13
Charlotte, NC—Urban Street Design Guidelines	x					61
Minneapolis, MN—Design Guidelines for Streets and Sidewalks	x					72
New York, NY—Street Design Manual	x					50
Portland, OR—Creating Livable Streets	x					Appendix A
St. Petersburg, FL—City Trails Master Plan	x		x			Appendix A
Santa Barbara, CA—Pedestrian Master Plan	x		x			Appendix A
Spokane, WA—Street Development Standards	x					Appendix A
Amarillo, TX—Downtown Amarillo Urban Design Standards		x				16
Austin, TX—Urban Design Guidelines		x				Appendix A
Big Lake, MN—Downtown Design Standards		x				Appendix A
DeKalb County, GA—Clifton Corridor Design Guidelines		x				18
Iowa—Statewide Urban Design and Specifications	x	x				Appendix A
Los Angeles, CA—Downtown Design Guide		x	x			20
New York, NY—Active Design Guidelines		x				52
Amherst, NY—Amherst Traditional Neighborhood Zoning Project			x			Appendix A
Arlington County, VA—Columbia Pike Form Based Code			x			23
Boise City, ID—Subdivision Ordinance			x			25
Denver, CO—Strategic Parking Plan			x			Appendix A

Policies and Practices	Category					Found on Page
	Public Right-of-Way Engineering and Geometric Design Guidelines	Architectural and Urban Design Guidelines	Planning and Land Development Regulations	Financing Mechanism	Operations, Maintenance and Enforcement Measures	
Minneapolis, MN—Downtown Action Plan			x			69
Minneapolis, MN—Pedestrian Master Plan			x			74
Miami, FL—Miami 21			x			27
Palo Alto, CA—Pedestrian Overlay Zone			x			Appendix A
Salem, NH—Depot Village Overlay District			x			Appendix A
Ann Arbor, MI—Local Resolution for Dedicated Non-Motorized Transportation Funding				x		30
Oklahoma City, OK—Project 180				x		32
Olympia, WA—Parks and Sidewalks Funding Measure				x		77
Olympia, WA—Transportation Impact Fees				x		80
Oregon—Dedication of State Highway Funds for Pedestrian and Bicycle Improvements				x		Appendix A
Sacramento, CA—Local Sales Tax for Transportation Projects				x		Appendix A
Salisbury, NC—Sidewalk Program	x			x	x	34
San Diego, CA—TransNet Tax Extension				x		36
Burlington, VT—Traffic Calming and Neighborhood Enhancement Program	x				x	38
Charlotte, NC—Sidewalk Retrofit Policy	x				x	64
Charlotte, NC—Transportation Action Plan			x		x	62
Chicago, IL—Safe Streets for Chicago					x	40
Hoboken, NJ—Hoboken Daylighting					x	43
Milwaukee, WI—Street Share Program					x	Appendix A
New York, NY—Pedestrian Safety Study and Action Plan			x		x	57
New York, NY—NYC Plaza Program					x	54
Olympia, WA—Transportation Mobility Strategy					x	82
Seattle, WA—Prioritization of Pedestrian Projects					x	Appendix A

as properties within municipalities under the control of other bodies, but local governments are often responsible for the planning, design, construction, and maintenance of pedestrian environments. The nature of these overlapping jurisdictions underscores the need for cooperation and collaboration among state, county, and local authorities.

Numerous and diverse players are developing and implementing practices that support the creation of safe pedestrian environments. Depending on the size of the community, a single agency or department may be responsible for the pedestrian realm or a vast network of agencies with highly specialized functions and responsibilities. Indeed, in five states (Alaska, Delaware, North Carolina, Virginia, and West Virginia) the state department of transportation (DOT) owns and operates both the primary and secondary highway system, making it the de facto highway department for counties and small towns (Kastenhofer 2010). Similarly, the role of elected officials may vary widely depending on the community's form of government, size, and degree of political activity.

To provide greater clarity on the development and implementation of the example practices listed earlier and described in Appendix A, the following section delivers narrative descriptions of a selected subset of those practices. These narratives are intended to offer descriptions of the players involved, the challenges faced, and the keys to implementation. These practices were selected to provide diversity in location, context, and development conditions.

Please note: All population, demographic, and journey-to-work figures, unless otherwise specified, are U.S. Census figures. For further notes on census data, see the data source information in Appendix A.

These narratives were largely informed through interviews with key staff involved in the development and implementation of these practices. Unless otherwise noted, information regarding the institutional and political context, and the development and implementation of these practices, was derived from these interviews.

Public Right-of-Way Engineering and Geometric Design Guidelines

Public right-of-way engineering and geometric design guidelines are the guiding documents that provide engineers, planners, and other transportation professionals with specifications for planning and designing streets. They frequently include recommendations or requirements for allocations of street space (e.g., lane widths), and other geometric features such as turning radii, as well as construction materials, and accessibility features.

The practices that support the creation of safe pedestrian environments through right-of- way guidelines aim to do so by making pedestrians more visible, more protected, and more comfortable. They aim to calm vehicular traffic, provide respite from the elements, and carve out greater space for active uses such as walking, bicycling, and congregating. These practices include broad goals such as "Design for Safety" (New York City Department of Transportation 2009) and "streets should serve multiple functions and encourage non-motorized uses"(Boston Transportation Department 2011). They often include objectives to make the pedestrian environment more comfortable and inviting and provide guidance on a broad range of pedestrian accommodations. These accommodations range from sidewalks and medians to curb extensions, and occasionally nontraditional concepts such as shared streets—where all modes share the right-of-way without delineation—as well as guidance on vegetation, furniture, and lighting. Often, the street design–focused practices explored in this synthesis call for a reevaluation of how streets are classified. Rather than focus on traffic volumes, these practices call for a more comprehensive approach that classifies streets based on contextual factors such as surrounding land uses. These guiding documents frequently supplement rather than replace dominant guidelines such as those in the *Manual on Uniform Traffic Control Devices* and the AASHTO *Policy on Geometric Design of Highways and Streets*. Right-of-way and engineering and geometric design guidelines typically have application for the full gamut of development conditions, including new development and street reconstruction as well as retrofit applications.

Boston, Massachusetts—Boston Complete Streets Guidelines

Boston, Massachusetts, known for its historic, compact urban form, is commonly thought of as a walking city (Boston Transportation Department 2011). The city is composed of 48 square miles of land and is home to roughly 600,000 residents. The Greater Boston area includes close-in cities and towns such as Cambridge, Somerville, and Quincy and has a population of roughly 4.5 million. Boston proper is composed of densely packed neighborhoods. The topography is generally flat and low-lying—the city is flanked by Boston Harbor and the Charles River to the east and north, respectively. The climate is defined as humid continental with maritime influences, meaning it experiences hot, rainy summers and cold, snowy winters (Peel 2011).

In an interview, Boston Transportation Department staff explained that since approximately 2006, Boston has been incorporating a multimodal approach to street reconstruction projects. This approach included consideration of pedestrians, bicycles, and transit, in addition to automobiles, as the city undertook these projects and began experimenting with ways to accommodate all users and improve safety. The transportation department staff found that the Complete Streets ideals captured what the city was trying to accomplish with its multimodal approach to street redesign;

specifically, improving "the quality of life in Boston by creating streets that are both great public spaces and sustainable transportation networks" (Boston Transportation Department 2011).

The city set out to formalize its approach with the creation of Complete Streets Guidelines that would put pedestrians, cyclists, and transit users on equal ground with drivers. The Complete Streets Guidelines would also incorporate green elements to create a more sustainable but also more pleasant public environment, and promote smart technology such as intelligent signals to create a more efficient network (Boston Transportation Department 2011).

Staff with knowledge of the guidelines' development explained that from early on, the Boston Transportation Department, which led the effort, recognized that for the guidelines to be meaningful, interagency cooperation would be essential. With the support of the mayor, Thomas Menino, a City of Boston Interagency Group was formed that included high-level participation (heads of departments and commissioners) from a wide array of city agencies, including the Public Works Department, the Environment Department, the Boston Public Health Commission, Commission on the Affairs of the Elderly, and the Office of Budget Management. In all, about 14 agencies have participated in the interagency group from the inception of the undertaking. Mayor Menino also appointed a Complete Streets Advisory Committee composed of local professionals, neighborhood residents, advocates, and academics to assist in the review process (Boston Transportation Department 2011).

Because the guidelines include multidisciplinary approaches and involve actions and physical spaces that are outside the Transportation Department's purview, agency staff felt that the cooperation of these agencies and the local experts on the advisory committee was essential to the success of the guidelines. For instance, the guidelines include specific recommendations for tree plantings. As explained in an interview with department staff, the Transportation Department has little internal experience or knowledge of tree plantings and relied heavily on the Parks & Recreation Department to compose those sections of the guidelines. The participation of these agencies and stakeholders was essential to producing a document that included actionable concepts.

As a Transportation Department staff member explained, getting these agencies on board with the project and working collectively was not without its challenges. Various agencies were not accustomed to working collectively or did not immediately agree with the goals and objectives of the guidelines. However, the strong support and leadership of the mayor helped bring these agencies to the table, and once the project was under way, the benefits of the Complete Streets approach and the opportunities of the undertaking convinced these agencies to stay engaged.

The general public also presented some opposition. This opposition was not significantly voiced during the process of creating the guidelines, but rather it arises in response to specific projects that incorporate elements from the guidelines. The street reconstruction projects that incorporate the Complete Streets principles are subject to public review and approval in the context of a Community Forum. When the general community does not call for or support these improvements, the projects do not move forward. In this regard, a Transportation Department staff member explained that educating local residents on the benefits of the Complete Streets approach has been a valuable component of the city's approach. The staff has found that it alone has difficulty convincing a local community. Rather, the presence of a core group of residents who favor and advocate for complete streets is important. Those residents then educate and convince their neighbors with assistance from the Transportation Department.

Boston Transportation Department staff said that the Boston Public Health Commission has recognized that safe pedestrian environments not only lower injury and mortality from accidents but, by creating a more inviting and pleasant pedestrian environment, encourage physical activity that can fight obesity and other fitness-related ailments. As such, the commission provides small grants in the range of $10,000–$20,000 to nonprofit community groups looking to make streetscape improvements in their neighborhoods. The Transportation Department then capitalizes on these community groups as self-identified Complete Streets Champions and seeks their assistance in making the case to the local community.

The Transportation Department has found that where communities disagree about the Complete Streets approach, the one unifying topic on which all residents can agree is the issue of safety. Department staff explained that, when Complete Streets improvements are presented in terms of the safety benefits—safety for pedestrians, for cyclists, and for drivers—there is often broad support for the measures.

The Transportation Department views the guidelines as a living document that will be iteratively updated as the city's experience informs it. The guidelines are not intended to be mandatory for every street project. Projects that incorporate the guidelines require the support of the local community. Despite being in a draft state, the guidelines are being included in contractual language as street reconstruction projects are let through the city's procurement process. Many of these changes, such as narrower lane widths, have been incorporated into these contracts for several years.

Transportation Department staff explained that the department and its interagency partners have found great value in learning from other cities that are undertaking similar initiatives. They suggest that the creation of Complete Streets Guidelines can provide a real opportunity to rethink public spaces and push the envelope in how the city and its

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transportation system function in terms of safety, sustainability, and efficiency.

For more information on Boston's Complete Streets Guidelines, visit the initiative's website at http://www.bostoncompletestreets.org/index.php.

Charlotte, North Carolina—Urban Street Design Guidelines

Rather than repeat the elements relative to public right-of-way engineering and geometric design guidelines here, see the complete Charlotte, North Carolina, case study in chapter three.

Minneapolis, Minnesota—Design Guidelines for Streets and Sidewalks

Rather than repeat the elements relative to public right-of-way engineering and geometric design guidelines here, the complete Minneapolis, Minnesota, case study is available in chapter three.

Architectural and Urban Design Guidelines

Architectural and urban design guidelines provide guidance or prescriptive requirements regarding the appearance, arrangement, and functionality of the built environment. They can be mandatory or elective and are typically driven by a vision to shape the built environment to achieve goals that affect the pedestrian environment both directly and indirectly. These guidelines often also include goals to support economic activity and housing choices.

Architectural and urban design guidelines often address the pedestrian environment through the inclusion of guidance on factors that affect the convenience of walking (e.g., building massing and orientation) as well as the visual appeal of those environments through guidance on building heights, setbacks, and fenestration. There is frequent emphasis on the "human-scaled" environment. The guidelines included in this synthesis incorporate goals to create sustainable, livable, and walkable environments through sensitive site and neighborhood designs. They appear to reflect an emerging trend of supporting active design, or design principles that encourage human active use of the built environment, by making physical activity more convenient, more appealing, and more natural. Architectural and urban design guidelines have applicability for new development and reconstruction, infill development, and retrofitting of the built environment.

Amarillo, Texas—Downtown Amarillo Urban Design Standards

Amarillo is the largest city in the Texas panhandle, with a population of close to 200,000 people. Located near the junc-

ture of two interstate highways (I-40 and I-27), it serves as a regional economic hub (Carlson 2006). The arid, windy climate is balanced with plenty of sunshine. While the region contains some hilly terrain, the city itself is relatively flat. (Carlson 2006). Amarillo experienced significant growth in the first half of the 20th century, much of which is reflected in its stock of historic architecture from this era (American Dreams Inc. 2011; *Texas Almanac* 2011).

Amarillo City Planning Department staff explained that by early 2006, the once vibrant downtown Amarillo was teetering on the edge of decline. During the previous decade, investment in Amarillo had been focused along the interstate highway and in the suburban areas (City of Amarillo 2008). The Planning Department found that downtown remained an employment destination, but few people lived or spent leisure time there. The area's key pedestrian corridors—Polk and 6th Streets—were not attracting shoppers or diners as they used to, and stakeholders were concerned that if something were not done, the downtown area would soon become a "ghost town."

As a Planning Department staff member recalled in an interview, a small group of community leaders from the private sector partnered with several city agencies and a local nonprofit group, Center City, to form the Downtown Revitalization Committee. The committee initiated a study to identify feasible solutions for revitalizing downtown based on existing conditions, local market analyses, and case studies from other cities.

The study was a catalyst for the development of a Strategic Action Plan for downtown Amarillo. Beginning in September 2006, the Downtown Development Committee engaged citizens to establish a common vision for downtown's future. The feedback gathered during large public meetings and individual stakeholder meetings served as the foundation for the Strategic Action Plan. The plan established 12 development goals—key among them was the adoption of urban design standards to facilitate the creation of a walkable, vibrant downtown. The Strategic Action Plan also called for a full-time staff person dedicated to downtown revitalization (City of Amarillo 2008).

Amarillo's local American Institute of Architects' chapter developed the first draft of the Downtown Amarillo Urban Design Standards as a community project. The draft was then brought before a Downtown Revitalization Subcommittee for editing, led by the dedicated downtown revitalization staff person. The subcommittee comprised property owners, Center City representatives, Planning Department staff, and other stakeholders. In August 2010, the city commission adopted the design standards as a new part of the zoning code for projects in the downtown area (Downtown Amarillo Inc. 2011). The design standards apply to public and private development within the boundaries of the Downtown

Urban Design District. In this zone, the Downtown Amarillo Design Standards prevail over the City of Amarillo Zoning Ordinance (City of Amarillo 2010).

The standards are based on six principles, including promotion of a pedestrian-oriented urban form; maximization of connectivity and access; and support of downtown businesses. The standards outline specific requirements for walkway corridors, building edges, signs, the street grid, and parking. The standards reinforce the community goal of walkability by requiring wide sidewalks, pedestrian lighting, street trees in the furnishing zone, and building practices that enhance street activity. Standardized street furnishings and bulb-outs are heavily encouraged where appropriate. The Downtown Urban Design District includes residential neighborhoods, which are important historic assets to the downtown area. The standards allow for variations within this special area to ensure appropriate preservation within the neighborhoods (City of Amarillo 2010).

A Planning Department staff member explained that while downtown revitalization was overwhelmingly popular in Amarillo, arriving at a consensus on mandatory design standards for the area was not an easy task. Historically, land use regulations have focused heavily on property owner rights, making the form and language of the new design standards quite unfamiliar to stakeholders. Sustaining public participation also proved to be challenging. Public participation for the Downtown Strategic Action Plan was impressive, but fewer people remained involved through the public hearing process for the Downtown Design Standards.

In May 2011, a group of downtown homeowners moved to repeal the standards. Through a citywide petition effort, they succeeded in securing a bid on the local ballot. Seeing that the new standards faced a major threat, a separate group of residents mobilized in support of the standards under the name Keep Amarillo Strong. Both groups brought their positions before the city commission and campaigned heavily in the time leading up to the vote (Welch 2011). The battle centered on the issue of property owner rights. In the end, 70% of voters opposed the repeal (Vieth 2011). The results of the vote energized the downtown revitalization effort, but they also illustrate the need for community buy-in early in the process, across multiple stakeholder groups.

A Planning Department staff member indicated that recent projects adherent to the Downtown Design Standards suggest positive outcomes and have been well received. Developers of several major projects in the downtown area recognized the market value of the design standards and voluntarily complied with the standards before they were finalized as part of the zoning code. The downtown built environment has already improved with the new streetlights, trees, and bulb-outs that were included in these projects.

For more information about the Downtown Amarillo Urban Design Standards, visit http://www.downtowna-marillo.com/development.

DeKalb County, Georgia—Clifton Corridor Urban Design Guidelines

The Clifton Corridor Community is an assemblage of suburban neighborhoods surrounding Emory University in DeKalb County, part of the core Atlanta metropolitan area (Clifton Community Partnership 2008). The suburban neighborhoods that define the corridor include Druid Hills, a historic neighborhood planned by the office of Frederick Law Olmstead in the "City Beautiful" mode around the turn of the 20th century (Clifton Community Partnership 2008). The topography of the area is moderate to hilly and streets are commonly curvilinear (Druid Hills Civic Association 2011). The climate is characterized by hot, humid summers and mild, occasionally cold winters.

DeKalb is a rapidly growing county that includes a portion of the city of Atlanta and is home to approximately 700,000 residents. Emory University is a significant institution in the area in terms of the physical presence of the campus and associated facilities, and as an economic driver—staff and faculty number roughly 24,000 and the university is one of the largest employers in the metro Atlanta area (Emory University 2010). A representative from the Clifton Community Partnership (CCP) explained that the university formed the CCP, a community-oriented initiative, to take a proactive role in fostering a healthy and collaborative relationship with the residents, businesses, and civic leaders in the surrounding communities.

The framework provided by the CCP helped to create a need for a document that could address four core community desires: "1) transportation choices that offer legitimate alternatives to single-occupancy vehicles; 2) housing that enables employees to live closer to their places of work; 3) more vibrant public activity centers; and 4) pedestrian-friendly streetscapes and outdoor spaces" (Clifton Community Partnership 2008).

A CCP representative explained that in late 2006, the CCP initiated an effort to produce urban design guidelines that would meet each of those objectives. The CCP held an iterative series of large public meetings, design charrettes, and individual meetings with key stakeholders to develop the guidelines (Clifton Community Partnership 2008). The resulting product, the Clifton Corridor Urban Design Guidelines, provides context-sensitive guidelines that improve the built environment, with particular emphasis on the pedestrian environment.

The guidelines cover a range of public and private spaces, including properties owned by Emory University and others. The guidelines identify 10 districts within the corridor

and, for each, describes development opportunities and design guidelines for both the public and private realms. The guidelines consistently emphasize the enhancement of the pedestrian environment through the prescription of more and wider sidewalks, raised and colored crosswalks, bulb-outs and other pedestrian-oriented infrastructure elements, traffic-calming measures, and a focus on building massing and orientation to bring the built environment closer to the street (Clifton Community Partnership 2008).

The completed design guidelines are intended to provide guidance to residents, neighborhood organizations, developers, and property owners in a voluntary capacity (Clifton Community Partnership 2008). A representative from the CCP and Emory University explained that the university will use the guidelines as it plans and designs for new developments, changes in existing buildings, as well as streetscape and other landscape initiatives. DeKalb County was an active participant in developing the guidelines. A planner with the DeKalb County Planning and Sustainability Department explained that although the county has not formally adopted the guidelines as an urban design overlay district, it does consider them as a policy document in the administrative review process. As described by the CCP representative, insofar as the final document has widespread approval and support from key stakeholders, it also provides elected officials with a road map of the kinds of improvements that the local community would like to see.

A CCP representative involved in the development of the guidelines explained that initially, some participants, particularly neighborhood groups, approached the process with skepticism, having witnessed other planning and design processes (that were not undertaken by CCP or Emory University) pit neighbor against neighbor. However, the skepticism was ameliorated by the inclusive meeting schedule. During these public meetings, participants repeatedly got to voice their desires and concerns and then see how the guidelines incorporated those desires and concerns.

A CCP representative identified several key factors in the development of the guidelines. First, he noted that the university's involvement was essential to the guidelines' success. Emory funded the project, and the guidelines would not likely have been developed otherwise. Second, the choice of consultants was instrumental. In the case of the Clifton Corridor Urban Design Guidelines, the CCP chose a consultant who was based outside of the region. This was beneficial as the consultant was able to sidestep and negotiate potentially difficult relationships among several key stakeholders. The consultant was able to bring a fresh view to the table and avoid the perception that the CCP was beholden to various interests.

For more information, view the Clifton Corridor Urban Design Guidelines at http://cliftoncommunitypartnership.org/learn/urban_design_guidelines.html.

New York City, New York—Active Design Guidelines

Rather than repeat the elements relative to architectural and urban design guidelines here, see the complete New York City, New York, case study in chapter three.

Los Angeles, California—Downtown Design Guide

Los Angeles is the second most populous city in the United States, with 3.8 million residents. The city boundaries include 465 square miles and extend over ocean beaches, mountain ranges, and rolling hills. Downtown Los Angeles is mostly flat. The city experiences a subtropical climate characterized by frequent sunny weather and an average of only 35 days of measurable precipitation (Weatherbase, Canty and Associates 2011).

The city's Department of Transportation formed a Pedestrian Advisory Committee made up of public representatives (residents, property owners, or other interested parties) from each city council district, a staff member from each council district office, and a representative from each of the public agencies in the city involved in some facet of pedestrian activity (Los Angeles Department of Transportation 2011). The Pedestrian Advisory Committee's mission is to promote a safe pedestrian environment and to encourage walking as a mode choice in Los Angeles (Los Angeles Department of Transportation 2011). That committee created a Walkability Checklist to provide nonbinding guidance to the development community on desirable pedestrian elements.

In 1999, the city passed an Adaptive Reuse Ordinance for downtown Los Angeles, providing an expedited project approval process and exemptions for older and historic buildings from zoning and building code restrictions applied to new construction (Los Angeles, Office of Historic Resources 2011). A Department of City Planning staff member explained that the ordinance ushered in a period of rapid development in downtown Los Angeles. It enabled the conversion of older buildings into residential and boutique hotels. The staff member went on to explain that these developments created a significant increase in the number of people living downtown, a neighborhood that did not traditionally have a significant resident population. Additionally, downtown benefited throughout the 2000s from a series of transportation improvements, including a new subway line, new light rail connections, and new regional commuter train connections.

The staff member further explained that the city recognized that this new activity in downtown demanded increased attention to the pedestrian environment. Automobiles had previously been given priority in downtown. The city saw an opportunity to codify the walkability checklist by implementing design guidelines that mandated certain design elements that would foster walkability and improve the overall pedestrian environment.

The local consultant hired to assist in the preparation of the guide found that the existing conditions were not well understood. The consultant sought assistance from local college and university students and undertook an unprecedented data-gathering effort to document widths from building edge to curb edge, curb to curb, and travel lanes for every block in downtown and every block segment where widths changed within the block. Understanding these dimensions was critical for determining what designs would be possible and appropriate.

A staff member explained that downtown streets had been classified for major or secondary highway standards. When the design guideline team reviewed the existing conditions, they found that many of the street classifications did not make sense, as they were discontinuous or were constrained by historic buildings or tunnels. On a block-by-block basis, the team reclassified all of the downtown streets and created new standards that included new minimum sidewalk widths that range from 15 in. to 24 in.

The development of the Downtown Design Guide was conducted under the review of agencies and stakeholders. A city planning staff member involved in the process explained that it was essential to the success of the project that each of the agencies that participated—the Department of City Planning, the Department of Transportation, the Community Redevelopment Agency, and Department of Public Works (bureaus of engineering, street services, and street lighting), and had high-level representatives with decision-making abilities. The process was conducted through an ad hoc Downtown Street Standards Committee.

The staff member went on to explain that participation was encouraged in part by the fact that each of the players knew that they would receive a useful product for their agency from this process. The Department of Transportation received a complete network plan with striping sections for all of downtown; the Bureau of Engineering received workable street standards without the many inconsistencies on existing standards, and the Community Redevelopment Agency received clear guidance on what is required to build a development. All of these products were also uploaded to a website (www.navigateLA.com) and are available to the public and the development community so that a developer can look at a specific street segment and know exactly what is required to develop an adjacent site.

While the design guidelines were in a draft state, the Community Redevelopment Agency and the Department of City Planning began applying the guidelines. This period allowed for testing or piloting of the guide so that the new standards could be adapted and refined prior to their formal adoption. This helped to produce a strong, workable document that accomplished its intended goals and minimized unintended difficulties.

Overall, the Downtown Design Guide has been well received. The most significant pushback has come from developers on a single issue. The design guide prevents new curb cuts and recommends driveway egress either on side streets or in alleyways. The Department of City Planning has held firm on this requirement despite complaints from developers. The guide has also been well received by elected officials, the general public, and other departments and agencies and is being implemented successfully. More information on the Downtown Design Guide can be viewed at http://www.urbandesignla.com/downtown_guidelines.htm.

Planning and Land Development Regulations

Practices that aim to create safe pedestrian environments through planning and land development regulations do so by encouraging land development factors that make walking more convenient and accessible while restricting those that do not. Frequently, these regulations address issues such as land use mixes, density, and street or pedestrian facility connectivity. These regulations manifest in myriad forms with varying goals. They can restrict the form and style of new development or regulate infill growth and redevelopment. Planning and land development regulations are typically oriented to the neighborhood scale or higher and seek to provide an underlying order to the greater built environment. It should be noted that land development regulations and land use plans change over time. Therefore, these regulations and plans may not reflect existing on-the-ground conditions.

Arlington County, Virginia—Columbia Pike Form Based Code

Arlington is a 26-square-mile urban county located across the Potomac River from Washington, D.C. It is home to more than 200,000 residents and is relatively densely populated, with 7,323 persons per square mile. Climate varies seasonally, with relatively cold winters and hot, humid summers (The Weather Channel 2011a).

A Planner with Arlington's Department of Community Planning, Housing and Development (DCPHD) explained that the county has experienced significant development in the past three decades. Although most areas of the county modernized during this period, the auto-friendly Columbia Pike corridor remained largely unchanged. Until recently, the area was characterized by older apartment buildings and single-story commercial centers set back from the road by parking lots.

In an interview, the DCPHD planner explained that during the late 1990s and early 2000s, residents began pressuring elected officials to revitalize "the Pike." Through public design charrettes and planning exercises, the community arrived at a vision for the Columbia Pike corridor. One key objective of that vision was to transform the Pike into an

attractive "Main Street" with mixed-use buildings and Complete Street features. The DCPHD felt that the Columbia Pike Form Based Code was an essential tool in transforming the corridor.

As described by a DCPHD planner familiar with the development of the code, it is intended to foster a pedestrian-friendly infill development pattern according to New Urbanism principles. While the code is not mandatory, it does provide a number of significant development incentives. Developers who choose to use the Form Based Code can expect expedited project approvals and lower development fees. The code also allows for the construction of mixed-use buildings in commercially zoned areas.

The Form Based Code was generally supported throughout the community. Residents were the first to call for change, and they actively supported the political figures who shared their vision for a vibrant, walkable corridor. The DCPHD worked with an experienced consultant team to create and implement the code. At the same time, other county departments moved forward with projects that supported the values of the code and facilitated redevelopment in the corridor. The Arlington County Department of Transportation undertook major bus service improvements along the corridor, while county-funded capital projects included burying overhead utility lines, planting street trees, upgrading bus shelters, and adding street lights. Efforts have also been made to narrow travel lanes, implement countdown crosswalk signals, and increase driver awareness of pedestrian safety issues countywide. A DCPHD planner felt that the successful coordination of these efforts ensured that the Columbia Pike Form Based Code remained an effective and timely tool for spurring pedestrian-friendly development along the corridor.

The code has been in place since 2003, and general perceptions have been positive. The code appears to be a successful tool for attracting and incentivizing infill development. According to a DCPHD planner, eight large private projects have been initiated in the corridor since the code was adopted, including more than 1,000 new housing units, several offices, and numerous retail projects. These projects incorporate building placement at the sidewalk line, street trees, and other New Urbanism principles fostering pedestrian-friendly environments. The DCPHD feels that because members of the public were heavily involved in developing the code early on, the approval process for code compliant projects has proven to be relatively easy for developers as well.

Despite the strong base of community support, the DCPHD has experienced a number of challenges in implementing the code. The Pike has been developed for more than 200 years and right-of-way lines and property ownership often vary between lots, increasing the logistical challenges of redevelopment.

A planner with DCPHD explained that interagency coordination was also an issue early in the process. When redevelopment efforts began, Columbia Pike was a state-controlled road, subject to state-level project approval procedures. Coordinating a local redevelopment effort through the state approval process proved challenging, and the county successfully petitioned to obtain control over the road.

Several key elements contributed to the successful implementation of the Columbia Pike Form Based Code. The first was a foundation of community and political support for the change. In the absence of a mandatory code, the DCPHD considered meaningful development incentives, such as lower fees and faster approval processes for code-compliant buildings, essential. A review checklist that matches proposed projects against key elements of the code and the community values it represents has been a useful aid in accelerating project approvals. The DCPHD did not have the opportunity to apply the code to test projects before it was fully approved, but planners involved in the process thought that it would have been helpful to do so. In lieu of such testing, the DCPHD has committed to maintaining an ongoing list of modifications to consider and has made technical tweaks and clarifications as necessary. Some community members have expressed frustration with the amendment process; opponents sometimes point to the need for amendments as evidence that the code is not working.

The Columbia Pike Form Based Code and the corridor revitalization effort it supports are part of a larger county-wide commitment to consider multiple modes of transportation in all planning efforts. The county has implemented a highly visible pedestrian program called WALKArlington, and was recently awarded Gold Level status as a Walk Friendly Community by the Pedestrian and Bicycle Information Center. The FHWA sponsors this national recognition initiative. Arlington was recognized for its exceptional pedestrian advocacy efforts, transit-oriented planning, and well-conceived pedestrian plan (Arlington County 2011; Pedestrian and Bicycle Information Center 2011). For more information about the Columbia Pike Form Based Code, or to view the Code, visit http://www.arlingtonva.us/departments/CPHD/forums/columbia/CPHDForumsColumbia-ColumbiaPikeInitiativeMain.aspx.

Boise, Idaho—Subdivision Ordinance

Boise, the capital of Idaho and the Ada County seat, is the third largest city in the Pacific Northwest, with a population around 200,000 and a metropolitan area population roughly three times that. The city is approximately 64 square miles with a population density of 2,913 people per square mile. It is characterized by relatively flat topography that descends slightly to the west. The city is oriented along the Boise River and is bound on the northeast by rapidly rising foothills. Boise has a semiarid climate and experiences four dis-

tinct seasons: mild springs and falls, cold winters with little snowfall, and hot, dry summers.

The Idaho Land Use Act of 1975, which is the state's zoning enabling act, required that all cities and counties develop and adopt a comprehensive plan intended to guide land use regulation. Two required components of the comprehensive plan are a zoning ordinance and a subdivision ordinance to regulate the size, use, density, and other characteristics of development projects. A subdivision review analyst with the city of Boise explained that around this same time, the separate Street Departments of all the cities and towns in Ada County were consolidated into the Ada County Highway District. The Highway District maintains jurisdiction over all existing and proposed rights of way. Its purview includes review of design and construction requirements that overlap with Boise's subdivision regulations. This means that any proposed development that includes new right-of-way or construction of new sidewalks must be reviewed and approved by the highway district as well as the city of Boise.

From early in the development of the subdivision ordinance, the city included pedestrian-friendly elements. This early lead on pedestrian issues has encouraged the use of Boise's Subdivision Ordinance as a model ordinance for pedestrian land use regulations elsewhere in the country (Central Savannah River Area Regional Development Center n.d.). The ordinance includes connectivity requirements—and the city does not view cul-de-sacs favorably (City of Boise 2011). Any new street that ends with a stub or dead end must be clearly signed to notify homeowners that if and when the adjoining parcel is developed, the stub street will continue through and connect to that development (City of Boise 2011).

In terms of connectivity, the ordinance places pedestrians on equal footing with motor vehicles. It requires that "street patterns in residential neighborhoods shall be designed for the needs of the bicyclist, pedestrian, and motor vehicle alike" (City of Boise 2011). In addition to requirements of sidewalks on both sides of any new street, it requires that a circulation plan be designed to "incorporate and tie into existing or proposed pathways…." (City of Boise 2011).

The ordinance includes substantial requirements for pedestrian connectivity through what it terms "micro-paths," or short pedestrian paths used to connect other pedestrian facilities or generators. It requires the creation and maintenance of micro-paths to provide access to adjacent schools, parks, substantial pedestrian or multiuse pathways, neighborhoods, shopping areas, public lands, transportation or other community facilities, public and private vacant parcels that could provide future connections to other sites, and "where streets do not provide convenient means of access for circulation within an area" (City of Boise 2011). Though the city prefers not to approve subdivision plans that include cul-de-sacs, they

are not explicitly forbidden and have been built. However, the city has used its ordinance to compel subdivision developers to create micro-paths on easements to create pedestrian connections for otherwise inaccessible cul-de-sacs.

The subdivision review analyst interviewed for this research believes that these micro-path requirements have been well received by local communities. He explained that the requirements have been in place for so long that they are simply a fact of life in Boise and are rarely if ever the subject of protest from neighbors, schools, or other property owners that abut these paths. The development community does occasionally voice frustration that the micro-paths increase the costs of development, but the city council has not bowed to opposition. Some developers recognize that the micro-paths offer an amenity that local residents value and use. There is a vibrant pedestrian and cyclist culture in Boise, and these paths are generally well used.

Additional opposition to the micro-paths has come from the Boise Police Department with the notion that these pathways create opportunities for violent and petty crime because they are not accessible to vehicles and may have limited visibility. However, these concerns have not been borne out. The subdivision ordinance does stipulate that these micro-paths must be well lit and not overly curvilinear so that pedestrians have an unobstructed view from one end of the path to the other. The paths must also be flanked by "see-through" fencing such as chain link or wrought iron, or by short solid fencing (City of Boise 2011). The concerns of the police have been ameliorated through regular formal and informal relationships between the Police Department and the Planning Department and City Council.

The city is currently rewriting its comprehensive plan, which will feature a unified code that includes both the zoning and subdivision ordinances in a single document. In this comprehensive plan rewrite, the city is considering including new regulations and performance measures to track whether the subdivision ordinance is having the desired impact. Some of the measures up for consideration include a connectivity index, tracking and requiring shorter block lengths, increased mixed-use zoning, and encouraging alleyways.

Boise's pedestrian culture is reflected in the City Council. The council has been a proponent of smart growth principles and has generally favored pro-pedestrian policies, including sponsorship of a robust Safe Routes to School Program. Boise's Subdivision Ordinance can be viewed at http://www.cityofboise.org/Departments/City_Clerk/PDF/CityCode/Title9/0920.pdf.

Miami, Florida—Miami 21

Miami is one of the largest cities in the southeastern United States. It boasts a tropical climate with an average annual

temperature of 75.9°F (Climate Zone 2011). Miami is quite flat—most neighborhoods in the city have elevations close to sea level—and it is also densely populated, with roughly 400,000 people within its 35 square miles of land area. Most Miami residents travel by car—79.8% of employed residents report traveling to work in a car, truck, or van. While the city boasts historic architecture in some neighborhoods, it has also experienced a major development boom and significant urban sprawl in the past 10 years.

After five years of planning and development, the city of Miami officially implemented a new, form-based zoning code in May 2010 (City of Miami 2011b). The code, called Miami 21, is guided by the principles of New Urbanism and Smart Growth (City of Miami 2011a). As a staff member with the city's Planning Department explained, it is meant to represent the community's vision for the "Miami of the 21st Century"—a city with well-balanced development, a high quality of life, and vibrant, walkable neighborhoods.

Miami 21 represents a marked break with the city's former code. It calls for mixed-use development, concealed parking, and ground-level activity. The plan's guiding principles favor infill growth, with new development at transit nodes to avoid sprawling, corridor-focused development. Thoroughfares are to be designed with pedestrian-friendly sidewalk widths, tree plantings, and street furniture placements. Miami 21 also carefully addresses the treatment of car entrances, pedestrian entrances, and parking lots to promote human-scale development and walkable environments (City of Miami 2011c).

Miami's previous ordinance, created in the 1980s during a development lull, included significant development incentives. Subsequently, Miami experienced a development boom in the 1990s and early 2000s, and the impacts of the code became apparent. Large as-of-right developments were built across the city with limited planning review or public notice and little regard for neighborhood context, traffic, or walkability. The city's Planning Department staff felt frustrated by the fact that the code lacked the planning review requirements that would allow the agency to address these issues. It was clear to Planning Department staff that a revised code that better protected quality of life and balanced development needs with those of other stakeholders would be beneficial. Miami 21 emerged as a way to completely reexamine the city's development priorities.

A Planning Department staff member who was involved in the development of code described how the creation of Miami 21 required significant cooperation among stakeholders and government agencies. The new code was a key piece of former Mayor Manny Diaz's agenda, and the mayor served as a vital political champion for the project. Miami's Planning Department worked closely with the Zoning Department and the Building Department, continuing an established and strong working relationship. The consultant team, led by the firm Duany Plater-Zyberk and Company, brought a strong background in smart code principles to the table, and a local land use attorney provided strategic legal advice. The well-balanced skill set of these key players was an essential part of the Miami 21 planning and development process.

However, there were several significant challenges in developing and implementing the radical changes to the Miami 21 zoning code. The largest hurdle was overcoming general resistance to change from stakeholder groups, including land use attorneys, developers, and property owners. To surmount this challenge, the Planning Department undertook a comprehensive public involvement campaign to educate Miami residents about the goals of Miami 21 and communicate the benefits of the proposed changes. The effort included direct mailings to property owners and more than 500 meetings over the 5-year planning process. The department leveraged social media tools, bus shelter ads, street banners, flyers, and advertisements. Strategic partnerships with neighborhood groups and a coalition of homeowners' associations strengthened the effort. Information was also disseminated through Miami's 13 Neighborhood Enhancement Teams—a network of municipal service centers throughout the city. The code was developed in an iterative fashion that included amendments based on stakeholder feedback. These outreach and education efforts were largely effective in garnering support for Miami 21 from a wide array of stakeholders, including many who originally presented opposition.

Legal obstacles posed another challenge. Under Florida's Bert J. Harris Private Property Rights Protection Act, property owners who can demonstrate that a government action "inordinately burdens" their property are entitled to some form of compensation (Florida Senate 2011). The Planning Department sought legal counsel to ensure that the code did not place inordinate burdens on property owners in the city.

The final significant hurdle related to nonconformities. Because Miami 21 was so different from the previous zoning code, planners in the Planning Department saw that its implementation would leave many existing structures nonconformant. The Planning Department emphasized nonconformity issues to ensure a smooth transition to the new code.

From the Planning Department's perspective, Miami 21's pedestrian environment enhancements were not contentious. There was widespread acceptance of the benefits of walkable neighborhoods and more pleasant pedestrian spaces. Projects in midtown and on Biscayne Boulevard incorporated these pedestrian enhancements and were initiated before Miami 21 was formally adopted, as developers recognized the demand for these kinds of improvements.

The lessons learned from the Miami 21 planning and implementation processes are likely applicable to commu-

nities of all sizes. The support of a political champion was vital. A clear public outreach plan with multiple communications platforms also proved a valuable tool for garnering community support. Securing early buy-in from key professional groups, such as the American Institute of Architects, also would have helped immensely. Internally, the agency found it essential to have an implementation-focused project team member—someone who could continually examine the real-world application of all code elements. Seeking departmental staff feedback early in the planning process can also greatly improve the code development process and strengthen internal support.

Miami 21 is relatively new, and the full impact of the code remains to be seen. Most projects submitted for design review conform to the code and include pedestrian-friendly elements. The Planning Department staff has also found that developers' general perception is that Miami 21 is simpler than the previous code and that it incorporates good design principles. The planning community widely regards the code as a success, and Miami 21 received the 2011 American Planning Association's National Planning Award of Excellence for Best Practice (City of Miami 2011b). Nonetheless, the Planning Department considers Miami 21 to be a living document. As implementation progresses, necessary amendments will continue to be made to accommodate input from developers, architects, and members of the public. For more information on Miami 21 and to view the code, visit www.miami21.org.

Financing Mechanisms

The primary goal of financing mechanisms that support the creation of safe pedestrian environments is to fund pedestrian-related projects. These mechanisms aim to either generate funding sources or carve out portions of existing funding streams for pedestrian programs and projects. Municipalities have developed a wide array of strategies to fund pedestrian improvements, including dedicated funds from local, state, and federal sources; developer contributions and impact fees; and tax increment financing. Some of the successful practices discussed in this report involve the creative adaptation of pedestrian programs to enable the use of funds not specifically directed toward pedestrian uses.

Ann Arbor, Michigan—Dedication of State Funds for Nonmotorized Projects

Ann Arbor, roughly 35 miles west of Detroit in southern Michigan, is home to the University of Michigan and has a population around 114,000. Hills and valleys define Ann Arbor's topography, with the most significant elevation changes occurring close to the Huron River, which flows southeast through the city. The city boasts significant tree populations in its parks and on its streets (City of Ann Arbor 2010). The climate, like much of the upper Midwest, is humid

continental with influence from the Great Lakes. The winters are cold with moderate to heavy snowfall; summers are warm and humid, while springs and falls are short and mild.

In the state of Michigan, Public Act 51 of 1951, referred to as "Act 51," governs state appropriations for transportation programs. The act generates funds through motor fuel and vehicle registration taxes and designates that revenue primarily to three recipients: the State Trunkline Fund for construction and maintenance of the state trunkline roads and bridges; the Comprehensive Transportation Fund, for capital and operating assistance to public transportation programs; and local road agencies. In fiscal year 2006–2007, state transportation revenue was around $2.25 billion (close to 65% of the state's transportation budget, with the vast majority of the remainder coming from federal funds), about half of which was generated by the state's 19-cent per gallon gasoline tax (Hamilton 2007). Act 51's distribution formula distributes roughly 60% of state funds to county road commissions, cities, and villages for the construction and maintenance of roads under their jurisdiction (Hamilton 2007). Section 10k of Act 51 stipulates that not less than 1% of the funds distributed to the local road agencies will be spent on nonmotorized transportation services or facilities. This source is the primary funding stream for pedestrian and bicycle projects and services across the state (Hamilton 2007).

As a senior staff member of the city's Systems Planning Department explained, the population of Ann Arbor historically has favored progressive policies. The city began undertaking bicycle and pedestrian planning in the late 1960s. This tradition carried through the 1980s, as the city rejected principles of constant roadway expansion and instead embraced Transportation Systems Management principles and sought to manage its existing assets by undertaking projects such as traffic signal modernization.

In the early 2000s, advocates and the general community began to push the City Council to increase efforts to build on its assets and improve the environment for all nonmotorized users. Building on this public support, the mayor, John Hieftje, introduced resolution R-216-5-04 to the City Council and argued that since the city was not building new roads, those funds could be reallocated to nonmotorized projects. There was widespread public support, and the City Council passed the resolution handily. The resolution goes above the state-mandated 1% minimum requirement and dedicates 5% of Act 51 funds received by the city annually for nonmotorized transportation uses. As of 2011, Ann Arbor is the only municipality in Michigan that is formally committed to spending more than the state minimum on nonmotorized transportation initiatives.

This push from the public also manifested itself in other resolutions aimed at improving the nonmotorized environment. Another resolution requires the city to accommodate nonmotorized users in any street reconstruction project at the

expense of the project or the city's general fund, as appropriate. The city also created a transportation program manager position responsible for overseeing nonmotorized transportation projects. These projects have included amenity improvements such as sidewalk furniture and wayfinding signage, sidewalk construction (the city currently boasts sidewalks on both sides of the street on 98% of its arterials and 82% of nonarterials), and crossing improvements (Pedestrian and Bicycle Information Center 2011). These crossing improvements include in-road stop/yield signs, midblock crossings, creation of a crossing location prioritization scheme, and regular maintenance of existing crosswalks. The city has also undertaken an array of traffic-calming initiatives through a neighborhood-based program that has resulted in the installation of speed humps, traffic circles, raised intersections, and road diets (City of Ann Arbor 2009).

The senior staff member interviewed credited the passage and success of resolution R-216-5-04 to the strong support and leadership of the mayor and City Council, and to the "spirit of the community," which has a long tradition of grassroots support for pro-walking policies. This support can be seen at public meetings and through community outreach processes undertaken for different initiatives, as well as through e-mails and phone calls received by city officials. Opposition to pedestrian improvements does occur occasionally, but primarily on the project level, where a neighbor may have issues with a particular aspect of an improvement. From a policy perspective, there has not been any significant opposition to the emphasis placed on nonmotorized projects.

As Ann Arbor increased its funding and emphasis on nonmotorized transportation projects, there was some reluctance on the part of some of the city's staff who had previously focused on conventional traffic engineering projects and solutions. The new transportation program manager, with a newly adopted Nonmotorized Plan and a high level of public policy and political support, was able to achieve institutional buy-in within the city departments. After several progressive pedestrian projects had been implemented, all staff was able see the benefits of the program in the data—that safety improved and congestion did not worsen. National pedestrian advocacy and information resources such as the Pedestrian and Bicycle Information Center were also helpful in sharing information about what has worked elsewhere around the country and advocating for nonmotorized funding on the national level. For more information on R-216-5-04, nonmotorized transportation funding, and planning in Ann Arbor, see Ann Arbor's Nonmotorized Transportation Plan at http://www.a2gov.org/government/publicservices/systems_planning/Transportation/Documents/Non-MotorizedPlan_Jan2007.pdf.

Oklahoma City, Oklahoma—Project 180

Oklahoma City is the capital of Oklahoma and lies roughly 200 miles north of the Dallas–Fort Worth metropolitan area.

Oklahoma City has a relatively large land area of roughly 620 square miles. This area is composed of 244 square miles of urbanized areas and an additional 377 square miles of rural areas. The city has a population density of 833 people per square mile, with a population around 575,000. The climate is notably hot and humid in the summer, cold through the winter, and prone to frequent weather changes on a daily basis. From midspring through late summer, the city experiences a severe weather season that can include frequent tornadoes.

In 2008, a study by *Prevention Magazine* and the American Podiatric Medical Association listed Oklahoma City dead last on a list of 500 cities in terms of walkability (Overall 2008). At the time, downtown streets were primarily multilane one-ways, featuring excessively long turning lanes. The road conditions enabled or even encouraged drivers to travel at near-highway speeds. The pedestrian environment left a great deal to be desired. Street trees were few, blocks were long, and little street furniture existed (Speck 2011). The city has since responded with an effort to improve the pedestrian environment in the downtown area with several large-scale public projects and infrastructure upgrades that have collectively become known as Project 180.

In an interview for this report, a former city engineer familiar with the development and implementation of Project 180 described how the city had been working on a Streetscape Master Plan that included downtown design guidelines aimed at making the downtown a more pedestrian-friendly, Americans with Disabilities Act-compliant, walkable environment. The existing conditions not only caused an inconvenience for those who wished to walk but also served as a barrier to those with restricted mobility.

The city staff truly considered the existing conditions to be a plight in need of remedy. In addition to the Streetscape Master Planning efforts, the mayor, Mick Cornett, also commissioned a walkability study that resulted in recommendations for converting streets to two-way flow, reducing travel lane widths, increasing angle parking and bike lanes to absorb the extra capacity, as well as planting trees along streets.

Independent of those efforts, the state of Oklahoma initiated a project to remove an elevated portion of Interstate 40 that runs through downtown and reconstruct it five blocks away on the periphery of the central business district. That project would create the opportunity for an urban boulevard in place of the highway and open an additional seven blocks to development that had previously been cut off from the central business district (Oklahoma City 2011). Although this project is not directly part of the Project 180 effort, the new space created by this project brought with it an opportunity for change and development.

Simultaneously, Devon Energy Corporation, which is headquartered in Oklahoma City, decided to pursue the con-

struction of a new consolidated corporate headquarters tower in the central business district. Devon's CEO, Larry Nichols, an Oklahoma City native and hometown booster, was determined to use this development as a tool to enable streetscape and walkability improvements, and raise the image and marketability of downtown Oklahoma City (Speck 2011). Devon entered a Tax Increment Financing (TIF) agreement with the city that made available $95 million in TIF funding for downtown public works improvements, thus enabling Project 180. The TIF agreement included the unusual proviso that Devon would be the sole holder of the TIF bonds. In effect, Devon is lending the city the upfront cash necessary to make the streetscape improvements, while that loan will be repaid through annual ad valorum taxes that would come due once the new headquarters is built (Speck 2011).

Oklahoma City complemented the funds available through the TIF agreement with additional General Obligation Bond funds that had been designated for downtown improvements, and funds available through the Utility and Water Trust, to produce a massive infusion of cash that has enabled the implementation of Project 180 more quickly than is often feasible with similar initiatives. This is one of the greatest successes of the project—its rapid implementation. The project was conceived in 2008. Three years later, substantial portions of the 180-acre project are complete and additional work continues. The project and its aggressive implementation schedule are possible only because of the massive upfront funding.

In terms of financing, the city faced few difficulties. The city has experience with TIF agreements; the Devon tower is the eighth TIF district in Oklahoma City. The Devon agreement did not require rewriting of any code or amending of the TIF enabling legislation. The TIF required an agreement between Devon and the city, as all TIFs in the city do. The unique size and details of the TIF agreement were negotiated between city and Devon in a conventional fashion.

The project has been extremely well received by the general public and garnered positive media coverage (Lackmeyer et al. 2009). Initially, there was some opposition from residents who lived in other sections of the sprawling city. However, the city made it clear that the funds for this project were not being spent at the expense of these other areas. These funds would not have been available if they were not spent on Project 180.

Project 180 demonstrates how a large cash supply can rapidly improve the pedestrian environment. However, not every town and city has a committed benefactor with equally deep pockets. Absent that, the city could have undertaken these improvements through a more modest phased approach with smaller, more conventional TIFs. For more information on Project 180, visit the project's website at http://www.okc.gov/project180/.

Olympia, Washington—Parks and Sidewalks Funding Measure

Rather than repeat the elements relative to financing mechanisms here, see the Olympia, Washington, case study in chapter three.

Salisbury, North Carolina—Sidewalk Program

Salisbury is a small city in rural Rowan County. The town features a historic downtown surrounded by residential development. Much of the town's street network is gridded into approximately 450' squares. This grid is neither precise nor completely regular. The topography of the town is gentle, varying from flat to mild rolling slopes. The climate is defined as humid subtropical, with mild winters and warm and humid summers. Spring and fall are long and mild. The population of the city is a little over 30,000.

The city of Salisbury has adopted a Land Development Ordinance (LDO) that requires developers to construct sidewalks along both sides of any new street, and along any street frontage on existing streets that lack a sidewalk, including infill developments. The requirement applies to any proposed subdivision or new development. The LDO includes a Sidewalk Payment In Lieu Program wherein developers can opt to pay a fee toward construction of sidewalks elsewhere in the city rather than construct the sidewalk along the new development. A Sidewalk Priority Index is used to identify priority sidewalk projects for In Lieu Fee allocation and offer developers a discount on the In Lieu Fee if the proposed development occurs on a low- or medium-priority street segment (City of Salisbury 2007).

The Sidewalk Priority Index is calculated for all street segments in the city and is tabulated by adding points based on the street's proximity to various trip generators and other characteristics, including other nearby sidewalk segments. If a development is to occur on a low-priority segment, the developer has the option of building the sidewalk or paying the In Lieu Fee with a 75% discount. On medium-priority street segments, the discount is 50%. On high-priority street segments, no discount is offered. The In Lieu Fee is updated yearly and is based on actual construction costs, including design fees, labor, and concrete costs. A senior planner with the city interviewed for this research explained that the current fee is $22 per linear foot.

The senior planner, familiar with the LDO, explained that in the mid-2000s the city began an incremental process toward developing the existing sidewalk ordinance. Originally, the requirement was applied only to construction on new streets. The city's Long-Range Plan, Salisbury Vision 2020, was approved in 2008 and encourages walkability and the creation of a seamless network of sidewalks throughout the city (City of Salisbury 2011). In drafting an LDO that cod-

ified the vision contained in the city's comprehensive plan, the Planning Board recognized that the vision of a continuous, seamless network of sidewalks could not be achieved with new construction alone and sought to require the construction of sidewalks for all developments in all locations.

This proposition was immediately met with opposition from the development community. Developers complained to the City Council that the requirement was unfair and would produce undesirable impacts. They argued that the additional cost would discourage economic development and force the construction of sidewalks in locations where they felt pedestrian activity should be discouraged, such as industrial parks (Wineka 2009).

The City Council directed the Planning Board to address these concerns. Rather than create a system of variances for the requirement, the Planning Board remained committed to the vision and policies delineated in the comprehensive plan, and sought a compromise through the LDO Committee (LDOC), an advisory committee formed to provide input on the formation of the LDO. The LDOC included participation from the Planning Board, City Council, and the development community, as well as property owners and neighborhood advocates. The LDOC was formed at the onset of the LDO drafting process and provided review and comments on each chapter of the LDO. This process contributed to a lengthy drafting process—approximately 4 years—but resulted in a strong LDO that had significant support from key stakeholders.

The development community has largely been supportive of the sidewalk program. However, there has been some pushback from owners of individual properties who feel that the burden placed on them is unfair. These landowners explain that for an individual, the cost can be quite significant, especially if theirs is a corner lot with two street frontages. Otherwise, the program has been well received, and the local community is supportive of the new sidewalks.

Although the city of Salisbury does track the linear footage of new sidewalks built each year, it does not specifically break out the footage that was funded through the sidewalk program. A key benefit of the program is that even in instances where developers do not opt to build sidewalks, the sidewalk construction fund grows. The Planning Department considers the program a success on both counts—more sidewalks are being built and the city has more funds to direct toward priority sidewalk projects. Another added benefit of the Sidewalk Priority Index is that the city has used its scoring scheme to demonstrate a need in response to a call for federally funded pedestrian projects.

A senior planner with the city's Planning Department has cited several keys to the success of the program. In the case of the LDO, the process of reviewing LDO chapters with

the LDOC, though time-consuming, was worth the effort because it produced an ordinance that had strong support from key stakeholders—politicians, the planning department, residents, and the development community. However, the success of the process also relied on political consistency. Though the LDO drafting process spanned three election cycles, the City Council members involved in the LDO process remained the same throughout. The In Lieu Fee discount was also essential to the success of the ordinance. Without this "release valve," the ordinance would have been unacceptable to the development community and thus unpassable. For more information on Salisbury's Land Development Ordinance and Sidewalk Program, visit http://www.ci.salisbury.nc.us.

San Diego County, California—TransNet

San Diego County encompasses 19 jurisdictions at the southwestern tip of California. Jurisdictions on the coast of the county are known for their beaches. Those on the eastern side tend to have hilly terrain. The population of San Diego County is just over three million people, with a population density of almost 700 people per square mile. The majority of residents (86.9%) travel to work by car, truck, or van. Just over 3% walk to work, and just over 3% rely on public transportation.

For several decades, San Diego's regional transportation network has benefited from a half-cent sales tax for local transportation projects called TransNet. The San Diego Association of Governments (SANDAG), the regional transportation planning agency for San Diego County, administers the TransNet program (SANDAG 2011).

Voters approved the first version of TransNet in 1988 with a simple majority vote. The measure distributed funds in equal thirds for highway, transit, and local road projects. One million dollars was allocated annually to bicycle paths and facilities (SANDAG, 2006). Although the original TransNet measure funded a number of Walkable Community Demonstration Projects, an associate planner with SANDAG explained that it lacked any dedicated funds for pedestrian improvements.

The original 20-year TransNet program was set to expire in 2008. Because of changes in the California legislative process, any extension of TransNet would require a two-thirds majority vote. Hoping that high voter turnout would increase the chances of securing the two-thirds approval, SANDAG initiated an effort to put the extension measure before voters in November 2004.

As a first step, SANDAG developed a plan for the TransNet extension measure that again evenly divided the majority of TransNet revenue among transit, highways, and local roads. Advocates from two local organizations, WALKSanDiego

and the San Diego County Bicycle Coalition, joined in the planning process, recognizing the TransNet extension effort as an opportunity to secure additional resources for active transportation (Conaughton 2004). The advocates called for more funding for alternative modes of transportation and broader funding guidelines, including provisions for pedestrian projects, planning activities, and traffic-calming measures (Conaughton 2004).

An associate planner with SANDAG explained that while SANDAG's plan for the TransNet extension measure maintained funding ratios similar to the original version of TransNet, it also included several new elements. Active transportation advocates succeeded in securing a 2% allocation of funds for bicycle paths and facilities, pedestrian improvements, and neighborhood safety projects through the TransNet Bicycle, Pedestrian and Neighborhood Safety Program (SANDAG 2006). This dedicated allotment put the TransNet extension measure on track to increase funding for active transportation to nearly $5 million per year. Another 2% of the funds was dedicated to a new Smart Growth Incentive Program (SGIP). The goal of the SGIP was to strengthen the link between land use and transportation by funding projects and planning activities that focused on compact, mixed-use development and increased transportation choices. Finally, the extension created the Independent Taxpayer Oversight Committee to monitor the spending of TransNet funds (SANDAG 2006).

Leading up to the extension vote, regional leaders and planners debated the future of TransNet. Balancing the immediate needs of automobile users with the long-term regional comprehensive plan goals of multimodal planning and smart growth proved to be a significant challenge.

During the spring of 2004, a debate arose regarding SANDAG's plan for funding allocations for transit, roads, and highways. Three of the five members of San Diego County's Board of Supervisors voted to oppose SANDAG's version of the proposed extension measure, stating that it devoted too much funding to mass transit (Conaughton 2004). SANDAG officials maintained that their proposal was well balanced, and stated that shifting money away from transit would alienate the large portion of county residents who support public transportation, threatening TransNet's success in November (Marks 2004a). The chairman of SANDAG's Board of Directors met several times with the supervisor most vocally opposed to the plan, but a compromise could not be reached before the deadline to make changes to the measure arrived (Marks 2004a).

By late summer 2004, the campaign began to educate voters and win approval for the TransNet extension measure, also known as Proposition A. Opponents of the measure included environmental groups that felt the measure did not go far enough to support public transit and several political leaders, including the opposing county supervisors (Marks 2004b). However, TransNet received strong support from several key environmental groups, active transportation advocates, and mayors from jurisdictions throughout the county (Marks 2004b; Ristine 2004; research interview). Supporters organized a formal yes-on-A campaign under the name San Diegans for Congestion Relief and campaigned hard in support of the measure (Ristine 2004). In November, just over 67% of San Diego County voters approved the 40-year extension of TransNet (SANDAG 2006).

In 2008, SANDAG expanded TransNet's impact on the pedestrian environment by adopting a routine accommodation policy mandating the appropriate consideration of bicycles and pedestrians in all new roadway projects funded by TransNet.

While the reliability of a dedicated funding source and a routine accommodation policy have facilitated improvements to the pedestrian environment in San Diego County, some implementation challenges remain. Pedestrian planning is a relatively new concept to many local jurisdictions in the region. SANDAG has employed a number of strategies to ensure that TransNet funds are directed to high-quality projects that align with the region's active transportation goals. One major step was revising the TransNet pedestrian project evaluation criteria to measure a project's compliance with SANDAG's *Planning and Designing for Pedestrians* guidebook. SANDAG has initiated educational workshops and technical assistance opportunities for local planners and engineers and provides an implementation assistance tool in the form of a matrix titled "Appropriate Bicycle and Pedestrian Accommodation Measures." This matrix provides design and implementation guidance for transportation facilities and land use contexts.

A comprehensive approach that combines various tools has been essential to SANDAG's success in leveraging the TransNet program to enhance the pedestrian environment. For example, TransNet's Bike, Pedestrian and Neighborhood Safety Program works as a direct complement to the Smart Growth Incentive Program; these funding programs share many overarching goals related to walkability, and funds from both programs have contributed to pedestrian improvement projects. SANDAG has found that this holistic view allows for greater flexibility and productivity. The agency is currently engaged in an effort to evaluate the impact of the various tools at work in pedestrian planning and project implementation, particularly the routine accommodations policy for pedestrians and cyclists. For more information about the TransNet program, visit http://www.sandag.org/.

Operations, Maintenance, and Enforcement

Practices that promote safe pedestrian environments through operations, maintenance, and enforcement measures vary

significantly in their goals and objectives. These practices include signal-timing projects, sidewalk repair programs, enforcement of speeding and crosswalk protection laws, and many other initiatives. These practices present targeted approaches and solutions to specific unsafe locations or conditions.

Burlington, Vermont—Traffic Calming and Neighborhood Enhancement Program

Burlington, with a population around 42,500, is the largest city in Vermont. The city is on the eastern shore of Lake Champlain and experiences warm, humid summers, mild transitional springs and falls, and cold, snowy winters. Downtown Burlington is built on a relatively flat plane, but the city rises to the east and gives way to rolling and occasionally steep hills to the south and east. The city's founding predates U.S. independence; however, much of the downtown and surrounding residential neighborhoods were developed in the 19th century, when Burlington was a center of trade.

During the creation of the 1991 Burlington Municipal Development Plan, cut-through traffic in residential neighborhoods was identified as a primary concern of local residents (City of Burlington 2003). That plan included the recommendation that "all efforts should be made to keep through traffic off local streets…traffic calming techniques will help keep [that] traffic off local residential streets…the city can enhance both the safety and quality of residential life on these streets" (City of Burlington 1991). Following this recommendation, the city began a pilot study in 1992 that reviewed practices in other comparable locations and initiated a neighborhood outreach process. That pilot study led to the creation in 1996 of a Traffic Calming and Neighborhood Enhancement program that established policy and processes for addressing neighborhood concerns about growing traffic in the community (City of Burlington 2003).

The objectives of the program are to (1) contribute to roadway safety, especially for children, by influencing conflict points, vehicle speeds, and vehicle volumes; (2) improve the physical environment by lowering vehicle-generated noise, pollution, and disruption; (3) create a green and inviting streetscape; (4) promote safe and pleasant conditions for motorists, bicyclists, pedestrians, and residents on neighborhood streets; and (5) encourage citizen involvement in all phases of neighborhood traffic-calming activities (City of Burlington 2003).

The program has created a framework for neighborhood-driven safety improvements. The process is initiated with a neighborhood petition. The petition provides a description of the perceived problem and must be signed by two-thirds of the residents in the neighborhood—which can consist of a single block or larger area. Once the city's Department

of Public Works (DPW) has received the petition and verified that the application requirements are fulfilled, a small, largely informal public meeting is held with the neighborhood residents (City of Burlington 2003). As described in an interview with a DPW planner, this meeting provides a forum for the neighborhood to describe the problem that it would like to have addressed in greater detail. At this meeting, the city also provides a detailed explanation of the process and examples of potential solutions.

Following this meeting, the city conducts a small-scale study of the problem described by the community. Frequently, the perceptions of the neighborhood do not exactly match the study findings. For example, speeding is frequently cited as a significant problem. However, after the city conducts a speed study, it is often found that there are few speeding vehicles. The city makes it clear that when this is the case, there are still measures that can be taken—it does not use the data to balk at taking action. The study also develops a measure for determining the project's impact on adjacent streets and establishes baselines to track those impacts.

DPW will then develop an enhancement proposal to meet the community's needs and address any issues identified in the study. Potential improvements include engineering fixes and other enhancements such as colored pavement, traffic circles, narrow travel lanes, bike lanes, reduced turning radii, and midblock pedestrian crossings (City of Burlington 2003). This proposal is then presented at another neighborhood meeting and must receive the support of 60% of the affected residents. If 60% do not approve, DPW will submit a revised proposal within 90 days. If the proposal is still not supported, implementation will not be pursued. If support is expressed, DPW will set an implementation schedule. Installations will remain in place for a minimum of 2 years, at which point the community may request the removal of the enhancement (City of Burlington 2003).

The Burlington Police Department employs a traffic safety officer who works with DPW upon request. When speeding is cited as the primary concern submitted by neighborhood enhancement program applicants, DPW will initially reach out to the traffic safety officer, who will then increase attention on the requested area through greater enforcement or other measures.

The program is a line item of the city's Street Capital Budget. Funding for the program has remained stable, and it is relatively inexpensive to administer. The program budget covers outreach, studies, and improvements. Often the proposed solutions are inexpensive and relatively small in scope. Most of the initiatives undertaken through the program cost less than $20,000.

Residents often submit requests for traffic calming or neighborhood enhancements on nearby streets. DPW has

struggled in these cases over whether these requests should be combined into a broader neighborhood-wide strategy or addressed individually through the defined process. Thus far, the city has decided to treat each street individually. DPW is reevaluating this approach and considering how the program could be amended to best accommodate neighborhood-wide concerns. For more information on Burlington's Traffic Calming and Neighborhood Enhancement Program, visit http://www.dpw.ci.burlington.vt.us/transportation/neighborhoods/.

Chicago, Illinois—Safe Streets for Chicago

Chicago has a population of about 2.7 million people, making it the third largest city in the United States. Located at the southern end of Lake Michigan, the city has cold winters and hot summers. The summer months bring the highest levels of precipitation. Chicago residents enjoy a strong public transit system; approximately 26% of residents use public transit for their daily commute. About 7% of residents bike or walk to work, and nearly 62% commute by car, truck, or van. Chicago's topography is quite flat. The city boasts numerous parks, summertime street festivals, and public art installations.

A staff member with the Chicago Department of Transportation (CDOT) explained in an interview that pedestrian safety is a major concern in Chicago. Based on the city's high rates of pedestrian fatalities, it was designated as a Focus City within a Focus State by the FHWA safety office. The FHWA safety office directs extra resources to these focus areas to help state and local officials address pedestrian safety issues (Federal Highway Administration 2011). Chicago experienced a string of high-profile pedestrian crashes in 2006, further prompting city officials across numerous departments to act to improve the pedestrian environment. During that year, CDOT approached the Chicago Police Department (CPD) to explore ways for the two agencies to collaborate to make Chicago's streets safer for all users.

Initially, establishing a workable framework for collaboration between CDOT and CPD was difficult due to limited resources. However, the agencies were able to identify speed control as an area of common focus within their available resource framework. CDOT had identified speeding as a threat to pedestrian safety. At the same time, CPD was in the process of increasing its focus on speed limit enforcement. As part of this effort, CPD had established a Targeted Traffic Team and obtained new speed reduction tools such as light detecting and ranging speed guns. The pragmatic approach of focusing on a common issue was key to the partnership between the two agencies and the city's Office of Emergency Management and Communications, which in turn helped build the enforcement component of the Safe Streets for Chicago campaign.

The enforcement component of Safe Streets for Chicago marked a new era of collaboration between CDOT and CPD;

it began a constructive dialogue between the two agencies about the role of enforcement in pedestrian safety. Together, they agreed that tougher enforcement of speed limits, yielding laws, and intersection turn regulations could go a long way in reducing pedestrian injuries and fatalities. CDOT and CPD then worked together to secure funding for police overtime for pedestrian safety enforcement through Section 402 Highway Safety Program grants.

To ensure the success of these enforcement efforts, both agencies began to meet regularly with the newly formed Mayor's Pedestrian Advisory Committee. The meetings strengthened the collaboration between CDOT and CPD and gave both agencies the opportunity to work with other city agencies, community groups, and stakeholders. Feedback and input from Mayor's Pedestrian Advisory Committee helped determine the location of enforcement efforts within the city.

Safe Streets for Chicago also benefited from unprecedented cooperation among CDOT, CPD, and the Illinois Department of Transportation on efforts to improve the quality of crash data. CDOT was able to secure funding from the Illinois Department of Transportation to integrate its crash data reporting systems, allowing CDOT to access high-quality, geocoded data much faster than before. The data will give CDOT a new understanding of road conditions, demographics, and driver behaviors in pedestrian crashes.

At the municipal level CDOT and CPD have worked together to improve police crash-reporting practices through an extensive officer education effort. Accurate and consistent crash reports have made local data much more reliable. Both of these data improvement initiatives allow CDOT to better target its enforcement and community education efforts.

Safe Streets for Chicago has been well received. Residents are grateful that action is being taken to improve pedestrian safety, and officers report being personally thanked by pedestrians during crosswalk and speed enforcement duty. CPD has increased citations for driver behaviors that threaten pedestrian safety, and driver behavior appears to be changing. With a recently secured grant, CDOT has begun collecting more comprehensive data to measure changes in driver behavior in response to enforcement efforts throughout the city.

Effective communication was described as a key element in the success of the Safe Streets for Chicago enforcement efforts. All of the agencies involved worked to secure staff buy-in for new pedestrian safety–related initiatives. Educating traffic enforcement officers about the goals of Safe Streets for Chicago to ensure that they were effective ambassadors in the community was another key element. In the public realm, the mayor's office provided political support to increase Safe Streets for Chicago's visibility among residents. This public-

ity, coupled with the officers' adoption of the ambassador role, increased public awareness of the issue of pedestrian safety and improved the results of CPD enforcement efforts. The overall positive community feedback for the program has led to the steady institutionalization of successful Safe Streets for Chicago efforts and processes.

There were several significant challenges in implementing Safe Streets for Chicago. In some cases, limited resources hampered CDOT and CPD's collaboration efforts. Grant funding has alleviated some these difficulties, but CPD must continually balance the need for improved pedestrian safety with high-priority crime-fighting efforts. Making pedestrian safety a higher priority issue proved difficult early in the campaign, and securing staff buy-in for changes required some effort. Public support for Safe Streets for Chicago helped overcome this hurdle, as did CDOT's commitment to comprehensive officer education. For more information about Safe Streets for Chicago, visit http://www.safestreetsforchicago.org/index.html.

Hoboken, New Jersey—Hoboken Daylighting

Hoboken is a small, dense, urban city located on the western shore of the Hudson River, across from the island of Manhattan. The city is approximately 1.3 square miles and has a population of around 50,000. The city's built environment is conducive to pedestrian activity, with its dense urban form and highly accessible transit system. Most of the city is within walking distance of a bus or train stop. Hoboken is relatively flat, although the level terrain gives way to a steep climb on its western border. The city experiences four distinct seasons, defined by cold winters and hot summers.

Hoboken has undertaken multiple projects to improve the pedestrian environment and increase pedestrian safety: a car-share program that maintains cars in highly visible and convenient on-street parking spaces, thus reducing demand for parking; a citizens' Traffic Calming Toolkit; a revised Bicycle and Pedestrian Master Plan that readjusted funding priorities; a "20 is Plenty" communications campaign intended to encourage drivers to drive 20 mph, rather than the posted 25 mph; and a "Surrender Your Permit" program whereby residents surrender their residential parking permits in exchange for benefits that include car-share credits and discounted or free walking and biking accessories (City of Hoboken 2011).

Each of the initiatives described above has been implemented since 2009, when Mayor Dawn Zimmer came to office and, with a new transportation and parking director, ushered in an era of increased attention to pedestrian issues in Hoboken (City of Hoboken 2011). The transportation and parking director explained in an interview that City Hall repeatedly fielded complaints from residents who described feeling threatened by cars in intersections. In these com-

plaints, citizens described conditions where drivers would not yield to pedestrians in crosswalks, as required by law. New Jersey state law requires drivers to come to a complete stop and stay stopped while pedestrians are in the crosswalk. State law also prohibits parking within 25 ft of a crosswalk to keep sight lines clear and to enable drivers and walkers to see one another in intersections. However, in Hoboken, where on-street parking is in low supply and high demand, parkers routinely encroach on the 25-ft area, thus making it more difficult to see pedestrians approaching crosswalks.

The city considered several approaches to improving the pedestrian environment in crosswalks. It was decided that passive enforcement through design would be advantageous. Although the installation of concrete curb extensions was considered, these plans were quickly scuttled because of cost and design considerations. In Hoboken, as elsewhere, drainage basins have frequently been installed at intersections, and the location of these basins prevents the construction of curb extensions or makes them extremely costly.

As an alternative strategy, the traffic and parking department developed the practice of "Hoboken Daylighting," referring to the practice of "daylighting" intersections by clearing the approaches to intersections to improve sightlines. The city began installing vertical delineators in the 25-ft crosswalk zone. The first delineator is installed 10 ft from the crosswalk and 4 ft from the curb, and a second delineator is installed 20 ft from the crosswalk and 4 ft from the curb. These vertical delineators create a physical barrier that prevents cars from encroaching on the 25-ft zone, thus creating clearer sight lines and improving crosswalk safety. This treatment is inexpensive (approximately $40 of materials per installation) and is quick and easy to install. It does not require any special review or amending of any statutes or codes, and it is highly effective. There have been incidents of would-be parkers driving over the delineators, but those occurrences are infrequent. The vertical delineators must be maintained, as snowplows and street cleaners can destroy them. However, placement of the delineators and education of street cleaners and plow operators can help minimize these losses, and the delineators are relatively inexpensive and easy to replace. The low cost of the delineators allows the city to fund the daylight treatments through its operations budget, adding to the nimble nature of the practice.

Local residents immediately embraced Hoboken Daylighting, and the city began receiving requests for additional locations for the treatment as soon as the first locations were installed. Though several residents have voiced frustration at parking spaces being removed, these complaints are quickly neutralized as residents are reminded that these are not legal parking spaces. There has also been limited opposition from some local businesses that have found that the removal of these spaces prevents customers from being able to idle in these spaces as they quickly patronize the businesses. Some

business owners have gone so far as to remove the delineators. Other complaints have focused on the aesthetic quality of the delineators. The city has chosen construction-orange delineators with reflective tape bands. The city is considering testing white columns to address these concerns.

The city now uses a two-pronged approach for selecting intersections to receive the Hoboken Daylighting treatment. First, the city accepts requests from the public. These can be submitted by phone or e-mail, or in person at City Hall. Second, the city has been reviewing crash data available through a state-funded, geographic information system (GIS)-based crash data management tool called Plan4Safety. The tool allows users to explore historical crashes by different criteria, including whether a pedestrian was involved, and review the police-generated crash report. The city has used this tool to identify the most dangerous intersections for pedestrians. Though the city and the general public consider Hoboken Daylighting to be a success, there are too few pedestrian crashes to be able to perform any meaningful evaluation of whether safety has improved at any given intersection. For more information on Hoboken Daylighting, visit http://www.hobokennj.org/departments/transportation-parking/.

New York City, New York—Enforcement Component of the Pedestrian Safety Study and Action Plan

Rather than repeat the elements relative to operations, maintenance, and enforcement here, see the New York City, New York, case study in chapter three.

EFFICACY

In discussing the effectiveness of the practice types described earlier, it must be noted that these practices are highly contextual. They were developed to match specific institutional, legal, and environmental frameworks. All of the practices above have been described as successful by those involved in the practices and other sources. However, the approach taken in one location may not be effective in another.

Evaluating the objective effectiveness of these practices is hampered by several significant factors. First, the availability of data presents a challenge. The U.S. Census Journey to Work data offer the most reliable information regarding how people travel to work. However, these data only capture work trips, meaning that they do not capture nonwork activity or individuals outside the labor market, including youth and the aging. Additionally, data regarding pedestrian crashes are inconsistently kept and maintained and for many locations, difficult to access.

Second, a great many of the practices included above have been implemented within the past decade. Many of these practices are also reliant on development to affect their desired impact. For example, for any architectural design guideline or developer impact fee to be effective, buildings must be built. There has been a precipitous decline in the amount of development activity nationwide leading up to, throughout, and following the economic recession of 2007–2009. In some of the practices discussed here, actual change in the pedestrian environment has been slow to come. However, in these cases, those involved in the implementation of the practice believe that a framework is in place that will result in an improved pedestrian environment once development activity returns.

That said, several recurring and commonsense themes relating to the effectiveness of practices have emerged. Architectural and urban design guidelines can be particularly effective if formally adopted as mandatory requirements or if the lead agency policy requires the incorporation of the guidelines into its designs or contracting language. This rule applies for right-of-way guidelines as well, with the caveat that they are subject to greater scrutiny and discretionary authority at higher levels of government. This factor can require more deliberate or negotiated implementation of local right-of-way engineering and design guidelines. Planning and land development regulations can be effective when accompanied by substantial support from the local community, expressed either by the community itself or through elected local officials. A wide range of financing mechanisms can successfully fund pedestrian projects, and many of the practices described above benefited from creative implementation of available mechanisms. Operations, maintenance, and enforcement measures have demonstrated success with ample community outreach and collaboration between relevant agencies, including engineering and police departments.

CASE STUDIES

INTRODUCTION

Four case study communities were selected from the state-of-the-practice review to provide more in-depth examples of practices that support the creation of safe pedestrian environments and to document how multiple practices can be coordinated or represent a multifaceted approach to improving the pedestrian environment. New York City, New York; Charlotte, North Carolina; Minneapolis, Minnesota; and Olympia, Washington, were selected as the case study communities to provide diverse examples of environmental and development conditions as well as varied approaches to pedestrian-friendly practices.

These communities vary in size and other demographic characteristics, geographic location, and development conditions. They include a small capital city (Olympia), two medium-sized cities with differing growth rates and development patterns (Charlotte and Minneapolis), and a large city with a well-established urban form (New York City). This variation helps to illustrate the challenges that transportation professionals face with regard to pedestrian issues and the different approaches and solutions used to address these challenges.

Telephone and in-person interviews were conducted with professionals involved in the planning or implementation of each of the practices described in the case studies. More than one professional was interviewed for each case study to provide multiple perspectives and create a richer understanding of political, institutional, and environmental contexts.

Case Study Summaries

New York City, New York

New York City (population: 8.2 million) was selected because of the innovative approach it has taken in recent years, piloting new and creative ideas to improve the pedestrian environment. New York City features the greatest number of pedestrians of any community and the highest population density in the country. The city's built form provides an example of prestreetcar development and highlights the challenges of making modern improvements to this built-out historic environment.

Charlotte, North Carolina

Charlotte (population: 730,000) was selected for its representation of many Sun Belt cities that experienced explosive growth in the age of the automobile. The land development patterns of Charlotte pose challenges for pedestrians that can be seen in many communities across the South and Southwest. Charlotte, more than many communities, has taken a broad-based and deliberate approach to improving development patterns and the pedestrian environment.

Minneapolis, Minnesota

Minneapolis (population: 380,000) was selected for the success it has demonstrated in encouraging pedestrian activity and creating a walkable environment despite significant climatic challenges. The city features one of the highest walk-to-work rates, as well as low pedestrian fatality rates. The city's efforts to improve the pedestrian environment demonstrate the benefits of interagency cooperation at all levels of government and highlight the power of pragmatism.

Olympia, Washington

Olympia (population: 50,000) was selected to demonstrate the power of a well-organized and pedestrian-supportive community. Despite development patterns that are less than supportive of pedestrian activity, the community has demonstrated overwhelming support for pedestrian improvements, and the city's transformation has been driven by bottom-up support and implemented by city department staff.

CASE STUDIES

New York City, New York

Pedestrian Environment

New York City is the most populous city in the country, with approximately 8.2 million residents. The city is composed of 304 square miles of land over five boroughs/counties (Manhattan/New York, Brooklyn/Kings, Bronx/Bronx, Queens/Queens, and Staten Island/Richmond), and boasts a population density of more than 27,500 people per square mile.

New York City's population is exceptionally diverse, having been a common port of entry to the United States for immigrant populations since the early 19th century. There is also significant income disparity. Roughly 23% of households have income more than $100,000, while 19% of all residents are classified as below the poverty level.

The city is largely flat and low-lying, although there are areas of steep topography. The climate is classified as humid subtropical, with cold, damp winters; hot, humid summers; and mild, transitional springs and autumns. Annually, the city experiences an average 234 days of sunshine, an average of nearly 50 inches of precipitation, and an average of more than 22 inches of snowfall, though snowfall varies significantly from winter to winter (National Climatic Data Center 2011).

New York City features significant mixed-use development and is home to two of the largest central business districts in the country (midtown Manhattan and downtown Manhattan), as well as other notable centers in downtown Brooklyn, and Jamaica and Long Island City in Queens. It has the largest number of public transit users in the United States; in fact, one-third of all U.S. mass transit users and two-thirds of U.S. commuter rail riders live in New York or the surrounding suburbs (Metropolitan Transportation Authority 2011). Roughly 55% of city residents over age 16 use public transportation to travel to work, while another 10% walk to work. These figures do not account for the vast numbers of metropolitan commuters who arrive in the city each day, mostly by rail or bus. New York City is one of the most heavily used pedestrian environments in the country at virtually all times of the day and night.

Institutional Framework

New York City features a strong mayor–city council form of government, wherein the mayor and city council are elected to 4-year terms. There are also five elected borough presidents. The city's government is highly centralized and responsible for public safety (police, fire, and emergency services), infrastructure, recreation facilities, sanitation, water supply, welfare services, and also public education, corrections, and libraries. This centralization contributes to one of the unusual aspects of New York City's government: its overall size. The fiscal year 2010 budget for New York City was more than $65 billion, making it larger than all but a handful of state budgets (Independent Budget Office 2005; Office of Management and Budget 2011).

Various city agencies are involved in facilitating safe pedestrian environments. The New York City Department of Transportation (DOT) is the primary agency involved in the management of the city's streets, sidewalks, bridges, and tunnels. With an annual budget of more than $2 billion, the agency is responsible for maintaining 6,300 miles of streets and highways; more than 12,000 miles of sidewalks; more than 1.3 million street signs; and more than 12,000 signalized intersections. More than 4,500 employees staff the agency, grouped into operational divisions that include Planning and Sustainability, Traffic Operations, Roadway Maintenance, Sidewalks and Inspection Management, Bridges, and the Staten Island Ferry (New York City Department of Transportation 2011).

The New York City Department of Design and Construction (DDC) is the city's primary capital construction project manager, providing design and construction services for projects ranging from firehouses to roadways to water and sewer mains. The agency works with a broad range of municipal entities and provides procurement services and construction management for the city's capital construction projects. DDC constructs and rebuilds streets, sidewalks, and other facilities used by pedestrians every day. Over the past decade, DDC has constructed more than 500 miles of new roadway and installed more than 42,000 sidewalk pedestrian ramps (New York City Department of Design and Construction 2011).

The Department of City Planning is the primary city agency involved in land use planning and zoning. Its mission includes the promotion of strategic growth, transit-oriented development, and sustainable communities (New York City Department of City Planning 2011). It also assists other municipal agencies and the public with policy analysis and technical expertise relating to housing, transportation, community facilities, demography, and waterfront and public space.

Other key entities include the following:

- The Department of Parks and Recreation, responsible for maintaining parks, playgrounds, and recreation facilities, as well as street trees and greenstreets (a program that converts barren traffic islands and medians into green spaces with shade trees, ground cover, and flowering plants);
- The New York City Economic Development Corporation, the city's official economic development corporation charged with driving growth and improving the quality of life;
- The Metropolitan Transportation Authority, the public benefit corporation responsible for public transportation in New York City and surrounding metropolitan area counties;
- Community boards, appointed citizen bodies organized into 59 neighborhood-based community districts that play an advisory role on issues related to land use and zoning, community needs in reference to the city budgeting process, and the delivery of services; and
- Transportation advocacy groups, notably Transportation Alternatives and the Tri-State Transportation Campaign.

Political Context

In 2007, during Mayor Michael Bloomberg's second term, his administration performed several significant actions germane to this report. The mayor oversaw the development of PlaNYC 2030, the city's long-term sustainability plan that provides direction for (1) accommodating sustainable growth in terms of population and economy, (2) combating climate change, and (3) enhancing the quality of life for all New Yorkers. Mayor Bloomberg also appointed a new commissioner to the Department of Transportation, Janette Sadik-Khan, tasked with implementing many of the transportation-related elements of PlaNYC. Commissioner Sadik-Khan ushered in a cultural shift within the agency, characterized by increased emphasis on safety, multimodal mobility, and sustainability, as well as greater cooperation and collaboration with other city agencies.

In anticipation of an expected population increase of more than one million new residents by 2030, PlaNYC offers policy direction and specific initiatives to accommodate that growth while improving the quality of life and the environment. Organized by subject areas—Open Space, Water, Transportation, Energy, Air, and Climate Change—the plan sets the agenda for city agencies in a meaningful way. DOT was tasked with a broad range of initiatives, many of which aimed to promote sustainable modes of transportation.

In 2008, DOT released two documents: "Sustainable Streets," the agency's strategic plan, and "World Class Streets," a report that presented new policies for the function and design of New York City streets. In the spirit of PlaNYC, these two documents offer bold calls for enhanced public and pedestrian spaces, with greater emphasis on the need to improve safety for all road users. Each of the practices documented below was enacted under the direction or as an ancillary component of PlaNYC, "Sustainable Streets," or "World Class Streets."

New York City's Street Design Manual

The development of the *New York City Street Design Manual* marked a change in the way DOT coordinated with other city agencies. In a new and meaningful way, DOT reached out and formed partnerships with agencies to produce a document that is intended to provide a comprehensive resource to those interested in creating high-quality street designs. The manual, published in 2009, also provides a framework for more efficient project implementation, with streamlined design and review processes.

The *Street Design Manual* development process began in 2007, shortly after the publication of PlaNYC and the arrival of Commissioner Sadik-Kahn. DOT convened an interagency task force that included the DDC, Departments of City Planning, Environmental Protection, Parks and Recre-

ation, and Buildings, as well as the Economic Development Corporation, the Landmarks Preservation Commission, the Design Commission, and the mayor's office to discuss needs and opportunities regarding street conditions. The group conducted site tours, reviewed construction materials and street treatments, and discussed innovative ideas.

During these interagency discussions, it became clear that there was no definitive or clear guidance regarding what could and could not be done within the public right-of-way. To remedy this situation, the task force, with DOT in the lead, sought to create a manual that would provide this kind of guidance. The resulting *Street Design Manual* was not intended to replace the city's existing engineering standards or environmental requirements. Rather, it was intended to collate these standards and requirements—and those of other agencies—into a single document and provide a comprehensive description of acceptable tools and practices that could be applied in different settings.

The *Street Design Manual* includes five chapters: (1) Use of the Manual, (2) Geometry, (3) Materials, (4) Lighting, and (5) Furniture. The creation of the manual allowed the participating agencies to push the boundaries and to provide guidance for undertaking practices that had not been used extensively in New York City, such as signal-protected bike paths. The initiative was driven by seven goals. The top goal was to provide guidance to *design for safety*—to create an environment where people and goods can move safely. The other six goals were design for access and mobility, context, livability, sustainability, visual excellence, and cost-effectiveness. The *Street Design Manual* emphasizes improving safety for the most vulnerable road users and modes.

Many of the guidelines in the manual directly address ways to improve pedestrian safety. Guidance is provided for sidewalk and median features and traffic-calming measures. The manual also provides guidance on practices that make the pedestrian environment more comfortable and appealing, including extensive guidance on lighting and street furniture.

In developing the *Street Design Manual*, one of the more difficult points to navigate was establishing the cost-effectiveness of many design elements. For instance, granite curbs may make for a more pleasant and inviting pedestrian environment than concrete curbs, but they are more expensive to build. The benefit of the more appealing curb was difficult to assess. The team found that it often could not assign a dollar value to benefits that are intangible or otherwise difficult to calculate. Instead, the manual leaves many of these choices to be decided on a project-by-project basis.

The greatest challenge of the *Street Design Manual* was not the development of the document; that process went relatively smoothly, with the participating agencies understanding the benefit of providing this type of guidance. Rather,

challenges arose during implementation and follow-through. For instance, the manual includes a new design review cover sheet to be included with every new streetscape design. This new cover sheet is intended to simplify review, providing reviewers with a quick reference to gauge the incorporation of the manual and encourage designers and engineers to incorporate design treatments featured in it into their designs. However, design review submissions are often received without this cover sheet. Internal adoption and implementation of the manual has required focused and persistent coordination with those involved in street design. This coordination appears to have paid off, as other agencies have agreed to include the design review cover sheet in their submissions to DOT for review.

Most guidelines in the *Street Design Manual* are not mandatory. The manual primarily offers guidance on the wide array of choices available to street design professionals (e.g., engineers, landscape architects, urban designers). In one instance, however, the manual did involve a regulatory change. The members of the task force agreed that a particular tinted concrete would be appropriate for commercial districts, as it visually enhances the sidewalks and reinforces the urban character of those areas. The change went before the Design Commission, and that provision is now mandatory. The city is considering making other elements of the manual mandatory and is now undertaking the first significant revision of the document, based on implementation experiences.

The *Street Design Manual* was written in-house, which created value and savings for the DOT. An outside editor and a few technical reviewers were used to polish the finished product, but the vast majority of the costs involved in the project were related to internal staff time. In describing the keys to success for the manual's development process, DOT senior staff cited the inclusion of the partner agencies early in the process and throughout its development and implementation. Without the active involvement of these partnering agencies, the manual could not have provided comprehensive guidance on the wide range of subjects involved in street design.

Active Design Guidelines

Since 2006, the American Institute of Architects, New York Chapter, has partnered with the New York City Department of Health and Mental Hygiene to organize a yearly Fit City conference that aims to promote public health and physical activity through design. During the closing remarks of the second Fit City conference in 2007, David Burney, the commissioner of DDC, made a commitment that the agency would produce a document to provide guidance on Active Design.

DDC and the Department of Health and Mental Hygiene led a collaborative process over the next 2 years that involved high-level participation from partnering agencies, including

DOT, the Department of City Planning, the Mayor's Office of Management and Budget, the American Institute of Architects, New York Chapter, and members of the academic community. Additionally, the project team sought input and review from many other city agencies—including the Mayor's Office of Long-Term Planning and Sustainability; the Mayor's Office for People with Disabilities; the School Construction Authority; and the Departments of Buildings, Parks and Recreation, Housing Preservation and Development, and Aging—as well as private sector professionals. The collaboration of all these agencies, particularly that of DOT and the Department of City Planning, was considered critical to the success of the document.

The resulting document, *Active Design Guidelines: Promoting Physical Activity and Health in Design*, is an innovative and unique product that provides guidance on design strategies to promote pedestrian activity not only in the public realm but also inside public and private buildings. Most architectural guidelines that promote safe pedestrian environments focus primarily on the interaction of buildings with public streets and provide guidance on characteristics such as building massing or fenestration. Although those elements are included here as well, the guidelines also include guidance on the provision of stairs and their emphasis over elevators. They also provide design guidance on encouraging pedestrian circulation within buildings.

Public spaces outside of buildings are not neglected by the guidelines. It offers guidance on providing access to transit and parking; parks, open space, and recreational facilities; children's play areas; public plazas; grocery stores and fresh produce; as well as guidance on street connectivity, traffic calming, and programming streetscapes. Many of the public realm objectives and strategies build on and include items from the *New York City Street Design Manual.* Similarly, collaboration among partnering agencies helped to strengthen the development of both the *Active Design Guidelines* and the *Street Design Manual.*

The *Active Design Guidelines* document is divided into subjects, each accompanied by an objective. Strategies are then offered to meet those objectives. For example, for "Public Plazas," the objective is to create "public spaces such as plazas that are easily accessible to pedestrians and bicyclists. Design plazas to support recreational activities, where space allows." One strategy would be to "locate public plazas along popular pedestrian streets" (New York City Department of Design and Construction 2010). Each strategy is then categorized by the degree of supporting evidence. The guidelines include strategies that are supported by strong evidence, emerging evidence, and best practices without a formal evidence base.

Early in the process of developing the guidelines, the potential for conflict with the Americans with Disabilities

Act and the disabled community was identified as a challenge. Much of the physical activity that the guidelines promote is based on walking and using stairs. To proactively address these concerns, the partnering agencies collaborated with the Mayor's Office for People with Disabilities. Throughout the development of the guidelines, as issues arose, the partnering agencies were able to find constructive solutions that addressed the needs and concerns of all stakeholders. These solutions would allow for the promotion of active uses while also granting full access to the disabled and mobility restricted.

Another challenge was the simple logistical difficulty of finding time for all of the representatives from the partnering agencies—most of whom was senior staff—to meet. However, without that high-level participation, the resulting document would not have been as rich in information and might not have been completed at all. The process also benefited from the input and collaboration of academics and other relevant professionals. Managing the conflicting schedules of all these players may have slowed the process, but in the end was worthwhile.

The *Active Design Guidelines* are not mandatory. They require the voluntary commitment of developers and city agencies. However, the guidelines have been applied to various projects. Since DDC is the city's design and construction agency, its lead in the guidelines enabled the opportunity to begin implementation immediately with both infrastructure and building projects. Also, since much of what was included in the guidelines was based on real-world, successful examples of good design, elements of the guidelines can be seen all over the city, in high-profile public spaces such as the High Line Park and in buildings such as Cooper Union's academic building at 41 Cooper Square. Additionally, various elements have begun to work their way into formal codes and statutes. For example, the guidelines include recommendations for including bicycle parking in office buildings. The New York City zoning code has been amended to include bicycle storage requirements in new construction and bicycle access for existing buildings.

The innovative approach of the *Active Design Guidelines* has drawn considerable attention from other localities. Cities ranging from San Diego to Birmingham have expressed interest in the Active Design principles, and DDC is offering assistance based on its experience. Contributors to the *Active Design Guidelines* feel that the principles contained therein are based on "good urban design" and are universally applicable. Although specific strategies may have to be adjusted based on climate or community characteristics, the design principles are considered universal.

NYC Plaza Program

PlaNYC 2030 included seven initiatives aimed at improving and creating open space for all New Yorkers. In what has become one of the most visible results of the plan, the Open Space chapter called for a reimagining of the public realm in the form of the creation of a public plaza in every community in the city. The initiative built on a successful pilot plaza in downtown Brooklyn, where pedestrian safety was improved through traffic calming and reduced crossing distances for pedestrians. This section of the plan called for the creation of at least four new plazas a year until every community district is served.

DOT was tasked with figuring out a way to convert public street spaces to pedestrian plazas. That process was initiated with the establishment of a task force that included participation from public space experts and advocates, including the Project for Public Spaces, the Pratt Center for Community Development, New York Restoration Projects, and several city agencies, among them the Department of Parks and Recreation, DDC, and the Department of Small Business Services.

The NYC Plaza Program is administered through a Public Spaces unit within the Division of Planning and Sustainability. This program makes plazas by reconstructing streets. It is a capital program, and the plazas do not necessarily undergo a temporary trial phase. Projects in this program often include utility relocation and more permanent capital construction components such as trees planted in the ground, new paving, drainage plans, and permanent seating. The average price of these projects is more than $2 million.

Aside from the NYC Plaza Program, DOT makes plazas through its operational units that are built with expense funds, composed of temporary, noncapital elements. These temporary plazas reconfigure streets with striping, paint, planters, flexible delineators, and movable tables and chairs. The highly visible public plazas along Broadway in Manhattan at Times Square and Herald Square serve as examples of the kinds of changes that can be made with these types of quick improvements. These plazas are typically undertaken with the intention that they will receive future capital funds to become permanent public spaces. These projects, depending on their size and context, cost much less than plazas constructed through capital funds, and range from $50,000 to $100,000.

The NYC Plaza Program is structured as a community-driven process. Not-for-profit organizations may submit applications to convert streets to new public plazas. DOT evaluates these applications based on criteria that include "Open Space, Community Initiative, Site Context, Organizational and Maintenance Capacity, and Income Eligibility" (New York City Department of Transportation 2011). The agency prioritizes sites in neighborhoods with inadequate open space. Participating organizations must be located near the proposed plaza site and take on responsibilities including maintenance, insurance, public outreach, design input, programming and events, and the creation of a funding plan.

In turn, DOT funds the design and construction of the plaza and performs site inspections.

Organizations whose plaza applications are selected eventually enter into an agreement with DOT to ensure that the plaza is kept clean and in good repair. If requested, the selected nonprofit partner may choose a new model agreement, a Master Concession Agreement that must be approved by the city's Franchise and Concession Review Committee. This agreement allows the organization to generate revenue on the plaza from concessions, limited sponsorships, and commercial events. The resulting revenue must then go back into the plaza and be used to manage and maintain the site.

Challenges faced by the NYC Plaza Program have included the difficulty of establishing a new program in a large organization; managing the development of new public spaces with multiple city and private stakeholders; dealing with newfound legal questions pertaining to public space, street closures, and public process; and constantly tightening budgets during an economic recession. One strength has been the focus on public participation, a process that includes letters of support from stakeholders, notification and review by local community boards and elected officials, and review and comment from the public through a public forum and public design workshops. Every project involves unique stakeholders and requires navigating a process with new and different property owners and city agencies. This has resulted in a slow but thorough and deliberate process.

Community engagement strengthens the program and has resulted in projects with robust support. For instance, if a given plaza requires the reclamation of parking spaces, the community gets to decide whether to choose pedestrian public space or on-street parking. If support for the plaza is lacking, then the project does not move forward. Demand for the NYC Plaza Program currently far exceeds the financial resources of DOT. If a particular community does not support an application, DOT will dedicate its resources to proposals that have support.

One downside of this approach is that large swaths of the city that are underserved by open space also lack nonprofit organizations capable of assuming the necessary responsibilities to apply to the NYC Plaza Program. DOT is seeking practical ways to address this problem and is considering options such as pooling insurance to reduce barriers and to ease the institutional requirements for organizations. Nevertheless, DOT also notes that this program has helped to jump-start the development of community organizations by enhancing public spaces in neighborhoods that have not had the benefits of city investment in recent years.

The plazas implemented thus far have demonstrated that there is no need to fear significant reimagining and reordering of even the busiest and most heavily used locations.

Though undertaken as a separate initiative known as Green Light for Midtown, the Times Square and Herald Square public plazas have incorporated the design principles and similar implementation processes as the NYC Plaza Program. In Times Square, since Broadway has been closed to auto traffic, auto travel speeds have increased in several travel directions, while decreasing modestly in others; safety has improved dramatically—injuries to motorists and passengers are down 65%, pedestrian injuries are down 35%, and 80% fewer pedestrians are walking in the active roadway. Also, pedestrian volumes are up 11%. Three-fourths of New Yorkers surveyed by the Times Square Alliance, the local Business Improvement District, felt that the area has improved dramatically since the plaza was implemented. In addition, commercial rents are up (New York City Department of Transportation 2010).

Pedestrian Safety Study and Action Plan

In the years following the release of DOT's Sustainable Streets strategic plan, the agency amplified its efforts to improve pedestrian safety through programs and projects such as (1) a Walk to School project, (2) Safe Routes to Transit program, (3) Safe Streets for Seniors program, and (4) strategic street reconstructions and retrofits guided by the practices described above.

Prior to the release of PlaNYC, the primary pedestrian safety strategy employed by DOT involved (1) identifying intersections that experienced frequent vehicle and pedestrian crashes, and (2) tailoring engineering or operational fixes for those specific intersections. A consensus grew within the agency that this strategy had reached the limits of its efficacy. As intersections were improved, new problematic intersections would emerge, often congregating along corridors. The agency decided to pursue a strategy that would allow for greater systemwide analysis of pedestrian safety and the causes of pedestrian crashes.

Around the same time, FHWA initiated a program that offered funding to cities and states with the highest number of pedestrian fatalities and/or fatality rates to assist in the development of pedestrian safety action plans (Federal Highway Administration 2011). While New York City has relatively low fatality rates compared with similar cities with high density and high rates of pedestrian activity, the sheer number of pedestrian fatalities qualified the city for the program. This also coincided with the passage of a city ordinance (Local Law 11 of 2008) that created new requirements for DOT to study pedestrian fatalities and severe injuries, and produce an action plan for improving pedestrian safety.

Over the next 2 years, DOT conducted an unprecedented study that looked at the causes and geographic distribution of more than 7,000 pedestrian crashes and sought to identify common factors associated with the crashes. The study exam-

ined geographic and design factors such as street width, and adjacent land use, nearby transit stops, socioeconomic status, and racial/ethnic composition of neighborhoods. It identified variables that had significant levels of correlation with pedestrian crashes, and built a statistical model that enabled detailed analysis of crash locations and crash severity. The findings of the study have provided much greater depth and understanding of pedestrian crashes in New York City.

Based on the findings of the study, DOT developed recommendations for actions and policies that were identified as having the greatest potential impact on reducing pedestrian fatalities and severe injuries. On the engineering front, the action plan includes recommendations for daylighting left turns (removing parking spaces to open lines of sight) on a pilot major Manhattan avenue, and taming dangerous traffic behavior at 20 intersections on major two-way crosstown thoroughfares in Manhattan. For enforcement, the plan recommends greater coordination of data collection and sharing between the New York Police Department (NYPD) and DOT, and increased enforcement of laws against distracted driver behavior such as cell phone use. The plan also recommends education and communications campaigns, since the study identified a lack of awareness of basic safety-related laws.

In the process of conducting the study and developing the Action Plan, DOT and NYPD have formed new lines of communication and developed a framework for regular coordination on traffic safety issues. Though the two entities have had long-standing relationships and communication, this project provided an impetus to arrange monthly meetings between the Traffic and Operations Division of DOT and NYPD's Traffic Enforcement Division. These meetings occur between operations-level staff rather than at the commissioner level. This new relationship has been productive and has resulted in greater information sharing. These meetings provide an opportunity for NYPD, which is armed with on-the-ground experiential knowledge of where severe crashes occur, to ask DOT to investigate specific locations. They allow DOT to ask for targeted enforcement at problematic locations that it has identified through statistical analysis.

One of the greatest challenges faced by DOT in this effort was data collection. To inform the study, DOT requested information and data sets from various city and state agencies. Compiling health-related data proved difficult, as it is subject to privacy protection laws. New York State is able to share some information with public agencies in aggregate form but does not allow for disaggregated, locally based analysis. DOT supplemented information available through the state with data collected and maintained by Department of Health and Mental Hygiene on all traffic and pedestrian fatalities that were not available from other sources.

DOT partnered with local universities to perform some of the statistical analysis used in the study. University faculty brought expertise in areas not found at DOT and was helpful to the study. However, the universities, unaccustomed to city contracting and invoicing requirements, had difficulty meeting those requirements, causing a real practical challenge to the process.

The Pedestrian Safety Study and Action Plan has set the goal of reducing pedestrian fatalities by 3% per year and on a project-by-project basis. DOT gathers baseline data before an improvement and follows any engineering improvement with tracking of safety data post-implementation. The Pedestrian Safety Study and Action Plan has provided critical information and policy direction for improving pedestrian safety in New York City.

Conclusion

PlaNYC 2030 demanded a rethinking of the public realm and prompted a new degree of interagency cooperation and collaboration. Though the city has long focused on protecting pedestrians, the policies of the plan reinvigorated those efforts. The initiatives described above likely would not have been possible or as successful without strong political support (and, in particular, strong mayoral support). That support encouraged agencies to work together in new and productive ways.

The efforts described above all involve a rethinking of conventions and demonstrate the types of improvements that can come from a fresh perspective. The *Street Design Manual* expanded the range of tools available to the many players involved in the creation of safe and enticing pedestrian environments. The *Active Design Guidelines* break down the boundary between the indoor and outdoor walking environments and highlight the need for safe and inviting attributes in both settings. The NYC Plaza Program shows how dangerous and uninviting streets can be quickly transformed into safe and vibrant public spaces. The Pedestrian Safety Study and Action Plan shows the value of deep analysis and targeted, strategic actions. Taken together, these practices demonstrate that real change is possible, even in short time spans, given strong support and adequate direction.

Charlotte, North Carolina

Pedestrian Environment

Charlotte, North Carolina, is the most populous city in the state, with approximately 730,000 residents. The city covers 298 square miles, with a population density of 2,232 people per square mile. The population is described as 50% white, 35% African American, and 11% Hispanic. The median household income is $52,364, just above the national level of $51,425. An estimated 9.4% of families are below the poverty level. With numerous colleges and universities, Charlotte is home to a sizable student population. The University

of North Carolina at Charlotte is the largest university in the city, with an approximate enrollment of 25,000 students (Office of Public Relations 2011).

Charlotte's climate is defined as humid subtropical. Winters are mild, and summers are warm and humid. Spring and fall are long and mild. The city receives an average of 43.5 inches of precipitation per year, evenly distributed throughout the year, with little snow. The central business district of Charlotte, known as Center City (also Uptown or Downtown), sits on a relatively flat plane and is hemmed in by a loop formed by I-277 and its interchange with I-77. Tall office towers dominate Center City. It also contains large surface parking lots and little residential housing. Outside Center City, Charlotte features rolling hills and a dense creek network but lacks significant topographic features.

The tall buildings of Center City give way to suburban residential development expanding in virtually every direction. Charlotte has experienced explosive growth over the past several decades, adding roughly 500,000 new residents between 1970 and 2010, more than tripling its population. As in many cities that grew rapidly during this time, development was highly automobile-oriented, reflected in a sparse thoroughfare network and low-density residential neighborhoods with few connections to the thoroughfares (Newsome et al. 2003). Neighborhood characteristics such as street connectivity and density differ significantly inside and outside of Route 4, a partial ring road roughly four miles from Center City. Route 4 generally marks the transition from older streetcar suburbs to postwar automobile-supported development.

Charlotte's public transportation system is provided by the Charlotte Area Transit System and includes approximately 40 local and neighborhood bus routes, and 20 express routes that provide spokes to the Center City hub. The Charlotte Area Transit System also operates a single 9.5-mile light rail line between Center City and the southern suburbs. Roughly 3.5% of workers 16 and older commute to work by public transit. Approximately 89% travel by car, truck, or van, the majority traveling alone. Another 1.9% of workers over age 16 travel to work by walking, which is less than the national average of 2.9%.

Political and Institutional Context

Charlotte has a council-manager form of government, wherein the mayor and City Council (that the mayor chairs) are elected to 2-year terms. The City Council appoints a city manager who serves as the chief administrator of the city. The mayor has the ability to veto ordinances passed by the City Council, though the council can override mayoral vetoes with a two-thirds majority vote (City of Charlotte 2011).

Charlotte is the largest city in Mecklenburg County and dominates its area. A Board of County Commissioners administers the county. The county and city share a number of responsibilities, including provision of emergency services and management of the Charlotte–Mecklenburg School District. The Charlotte–Mecklenburg Planning Department is the primary agency involved in land use and zoning issues. The agency also provides transportation planning support services to the Mecklenburg–Union Metropolitan Planning Organization.

The city of Charlotte Department of Transportation (CDOT) is composed of six divisions: Development Services, Departmental Services (Administration), Engineering and Operations, Planning and Design, Public Service and Communications, and Street Maintenance. CDOT is the key agency involved in the design, maintenance, and operation of the city's street space. The agency is staffed by roughly 430 employees, who maintain 2,400 miles of streets, 680 signalized intersections, and nearly 1,600 linear miles of sidewalks. CDOT's fiscal year 2010 operating budget was just over $21 million (City of Charlotte 2011).

Various overlapping policy initiatives and guiding documents have built on one another since the early 1990s linking transportation and land use planning in Charlotte. In 1994, the City Council adopted Centers and Corridors, an overarching policy to guide growth and development. The policy identified a series of activity centers, predominantly around the perimeter of the city, linked by corridors radiating from Center City. This policy document recommended focused growth and densification of these areas and was driven by the council's recognition of the fact that the city's future quality of life was dependent on how the city managed its explosive growth.

The Charlotte City Council has formed five subcommittees that focus on distinct quality-of-life–themed issues, termed focus areas. These subcommittees research and discuss policy options and provide direction to city staff under guidance from the mayor and City Council. In 2005, the council adopted a Focus Area Plan that included the mission statement, "Charlotte will be the premier city in the country for integrated land use and transportation choices" (City of Charlotte 2011). The Focus Area Plan also included five goals to further this mission: (1) continue implementation of the Centers and Corridors strategy; (2) prioritize, design, construct, and maintain convenient and efficient transportation facilities to improve safety and neighborhood livability, promote transportation choices, and meet land use objectives; (3) collaborate with local and regional partners on land use, transportation, and air quality to enhance environmental quality and promote long-term regional sustainability; (4) communicate land use and transportation objectives and services to key stakeholders; and (5) seek financial resources, external grants, and funding partnerships necessary to implement transportation programs and services. The mission statement and supportive goals have

set the agenda for transportation and land use policy decisionmaking ever since.

Urban Street Design Guidelines

In the early 2000s, a consensus grew within CDOT and the greater community that the development trends of the previous decades had left much to be desired in terms of the overall quality of streets and network connectivity. There was a sense that recent street construction and development projects lacked amenities and characteristics that made many of Charlotte's older neighborhoods desirable places to live. In 2001, the Charlotte City Council adopted Smart Growth Principles, an eight-point policy directive that included principles such as "expand transportation choices," and "sustain effective land use decisions," to ameliorate the impacts of this style of development, including a commitment to expand transportation choices through integrated land use and transportation planning (Newsome et al. 2003).

CDOT recognized that the traditional method of designing and planning streets to maximize vehicle throughput restricted the ability to support varied land use and transportation choices, as called for by the Smart Growth Principles and later by the Transportation Focus Area Plan. Beginning in 2002, the agency initiated an effort to develop new street design guidelines that would allow the city to create better streets that would "provide more capacity and safe and comfortable travel for motorists, pedestrians, bicyclists, and transit riders" (Charlotte Department of Transportation 2007). CDOT led the process with the Planning and Engineering Departments and the Charlotte Area Transit System, working in close collaboration through the development and review of the guidelines.

The resulting document, the *Urban Street Design Guidelines* (USDG), provide a comprehensive approach to street design. It includes design guidelines (text and diagrams) for streets and intersections, a thorough treatment of the evaluation of street space, and an approach for applying the guidelines. The USDG uses a Complete Streets approach that seeks to accommodate all road users in a context-sensitive framework. The USDG also includes the development of Multimodal and Pedestrian and Bicycle Level of Service analyses for signalized intersections. These analyses are used as a diagnostic tool for understanding the functionality of intersections prior to USDG upgrades and for tracking these improvements over time.

The city began implementing the USDG on its capital projects in 2004 on a best practices basis, and City Council formally adopted the USDG in 2007. Implementation of the USDG as it was being developed was useful, as it gave the public and the participating agencies an opportunity to see in the real world the types of street environments the USDG would produce. This helped build and maintain public support for the approach and also allowed the guideline development team to fine-tune and adjust the USDG based on lessons learned. The USDG is now applicable to all street reconstruction or modification projects.

In developing the USDG, one significant challenge was deciding the appropriate level of detail to include. The goal was to provide comprehensive guidelines, but the team found that as the level of detail increased, the level of analysis required also increased, almost exponentially, as each decision requires thorough exploration of the interrelated and complicated relationships between various design elements. In the end, though, the team settled on guidelines that are truly comprehensive and thorough, and staff feels that this thoroughness has provided a much richer and more useful document.

The development of the USDG was funded through CDOT's operational budget. The effort grew to be moderately expensive relative to other CDOT planning initiatives primarily because of the amount of staff time that was required to produce a truly thorough document. One of the keys to success in developing the USDG was soliciting input from multiple sources, including the four participating agencies and a diverse group of professionals, academics, agencies, advocates, and the general public.

Transportation Action Plan

In the mid-2000s, CDOT sought to undertake the city's first comprehensive transportation plan to provide greater clarity and direction to "policies and implementation strategies to achieve the city's transportation related goals" (Charlotte Department of Transportation 2007). The plan would build on the Centers and Corridors strategy and provide specific details regarding existing conditions, as well as the identification of projects, programs, and specific initiatives to manage and accommodate growth while meeting the transportation needs of the city.

CDOT led the charge and worked in collaboration with the city's Planning, Engineering, and Property Management Departments and the Charlotte Area Transit System. Public workshops and meetings were held, and CDOT developed a survey for the general public to ascertain baseline preferences and awareness of transportation-related issues.

The resulting document, the *Transportation Action Plan* (TAP), is composed of two major sections: a policy document that provides specific initiatives and policies to achieve the five goals listed in the Focus Area Plan, and a technical document that provides a report card evaluation of existing and future conditions, with analysis of trends in the city, and a thorough review of revenues and funding needed to implement the strategies described in the policy document. The policy document was officially adopted by the City Council

in 2006 and has served as an umbrella document guiding a significant portion of CDOT activities, particularly programs and initiatives that involve linkages between land use and transportation, including several key pedestrian environment enhancement programs. The technical document was not intended for formal adoption by the council, but rather provides key information to aid CDOT in assessing and tracking progress of the policy document.

The TAP includes numerous initiatives that address some facet of pedestrian safety. There are traffic-calming recommendations such as "The City will identify and analyze roadways where speed related collisions constitute a higher percentage of all crashes to prescribe engineering or enforcement countermeasures, consistent with the Urban Street Design Guidelines, to address excessive vehicle speeds," and pedestrian facility requirements such as "The City will provide sidewalks, crosswalks, pedestrian signals, lighting and other facilities consistent with the *Urban Street Design Guidelines* to make it easier, safer, and more enjoyable for people to walk" (Charlotte Department of Transportation 2007).

The TAP process included a requirement for annual reporting on implementation progress. The annual reports review the progress of initiatives in support of each of the five goals of the TAP. For each, the report documents achievements to date, current activities, and a review of issues and challenges. The annual reports document the success of the TAP in terms of real projects and actions completed in furtherance of its guiding goals and principles. Recurring issues and challenges relate to the difficulties faced by a local agency that must rely on and work within federal and state policy frameworks and funding requirements. For instance, in 2009, the *TAP Annual Report* noted that the North Carolina Department of Transportation's "project designs have often not reflected Charlotte's urban vision and multi-modal requirements" (City of Charlotte 2009). The report went on to note that the North Carolina Department of Transportation had recently passed a Complete Streets policy and had begun to change its designs for projects in urban areas.

In 2011, CDOT initiated a 5-year update of the TAP. Through public workshops, an online survey, and a systematic review of TAP policies and strategies, the agency seeks to revise the document to maintain its relevance and to reflect lessons learned.

Sidewalk Retrofit Policy

The TAP provides policy direction to CDOT and includes objectives that support its overall vision. One such objective states that "The City will construct more than 625 miles of new sidewalks by 2030" (Charlotte Department of Transportation 2006). The USDG provides guidance on the quality and design of those facilities. To implement these quanti-

tative and qualitative measures and provide a mechanism for identifying and prioritizing sidewalk projects for street segments where the streets have already been built but sidewalks were never installed, the city developed a Sidewalk Retrofit Policy.

Until 2005, Charlotte used a request-based system wherein residents could call the city and request a sidewalk on their street. CDOT would prioritize those requests based on internally agreed-upon criteria and build the sidewalks in order of priority as funding became available. With this approach, the city repeatedly encountered opposition from neighborhood residents on low-volume streets who disagreed with the need for sidewalks or were reluctant to sign necessary easement documents. To mitigate these challenges, CDOT developed a formal policy that would allow for objective evaluation of sidewalk needs and provide a process for community input. All of the streets in the city have been categorized into four classes: thoroughfares; local roads and collectors with traffic volumes greater than 3,000 vehicles per day; local roads and collectors near a park or school and with traffic volumes between 1,000 and 3,000 vehicles per day; and local roads and collectors with traffic volumes less than 3,000 vehicles per day.

In recognition of the role that thoroughfares play handling high volumes of traffic and providing key linkages, sidewalks on thoroughfares are deemed critical to provide safe conditions for pedestrians, separating them from high-volume and high-speed traffic. Local roads and collectors with traffic volumes more than 3,000 vehicles per day and those near parks and schools are similarly deemed to be crucial to the improvement of the pedestrian environment. CDOT staff typically identifies these sidewalk needs, and while the agency conducts community outreach and solicits input on these sidewalk projects, it will move forward with or without significant support from residents on those street segments.

For sidewalk projects on local roads and collectors with fewer than 3,000 vehicles per day that are not near a park or school, the Sidewalk Retrofit Policy prescribes a resident nomination process. Residents who live on these streets may submit a nomination form that contains the signatures of at least 25% of property owners or tenants on both sides of the street. CDOT then holds a public information meeting to provide residents information about the project and solicit their input. If after that meeting, 60% of property owners support the project, it will move forward for construction.

CDOT found that the more public input the agency solicited upfront, the better the sidewalk projects were received. Occasionally, opposition to retrofitted sidewalks would persist, but more often than not, early engagement allowed for constructive dialogue. City residents could get a clearer sense of the nature of the project and the value of the side-

walk to the greater community, and the agency could learn and address community concerns.

Another key component of the Sidewalk Retrofit Policy is the clear and objective prioritization criteria. For three of the four categories, sidewalk projects are assigned specific point values for characteristics such as connectivity to other sidewalks, proximity to land uses serving elderly people or people with disabilities, evidence of a worn path, and 12 other criteria. For local roads and collectors near a park or school with traffic volumes between 1,000 and 3,000 vehicles per day, projects are prioritized based on average annual weekday traffic; proximity to a school; proximity to a park, greenway, or recreational center; and school type.

The city of Charlotte funds its Sidewalk Retrofit projects through the issuance of bonds. The Sidewalk Retrofit program is currently funded with approximately $7.5 million per year. The city tracks the number of miles of sidewalks built each year through the program and through other ordinances and programs that require building sidewalks. The city typically constructs at least 10 linear miles of sidewalk per year through these various programs. The Sidewalk Retrofit program has effectively improved the sidewalk network, filling in gaps and creating greater connectivity.

Conclusion

Each of these three practices fills gaps in its respective areas. The TAP provides guiding goals and objectives specific to the transportation environment where that guidance was previously lacking. The USDG, "by describing how Charlotte's streets should be designed, is a fundamental component for implementing the TAP and providing the necessary street network for decades to come" (Charlotte Department of Transportation 2007). The USDG is essential for setting the course for future development and street reconstruction. The Sidewalk Retrofit Policy provides a practical implementation tool for literally filling gaps in the pedestrian environment.

The TAP, the USDG, and CDOT's Sidewalk Retrofit Policy were all developed in the same approximate time frame. Each reflects a larger cultural and philosophical shift within CDOT, Charlotte's municipal government, and the city as a whole toward recognition of the need for smart growth and acceptance of Complete Streets principles. These practices are components of a large-scale attempt to correct the land use and transportation decisions of the past. Charlotte has engaged in several practices to address these problems, including a well-documented effort to foster transit-oriented development along its light rail line. That Charlotte's efforts are not yet evident in high walk-to-work commute rates demonstrates the enormity of the challenge posed by land use and transportation decisions of the past and underscores the value of planning early in the development of a city.

Minneapolis, Minnesota

Pedestrian Environment

Minneapolis, located in the eastern central portion of Minnesota, sits along both banks of the Mississippi River and bounds St. Paul, the state's capital. Minneapolis is the most populous city in the state, with 382,578 residents. Covering roughly 55 square miles, the city has a total population density of 6,970 people per square mile. The greater Minneapolis–St. Paul (Twin Cities) metropolitan area is home to 3.5 million residents. Minneapolis experienced a prolonged population loss starting in the 1950s that lasted through the 1990s: The 1950 peak population around 520,000 had dropped to 370,000 by 1990. Since that time, the trend has reversed; the city has experienced modest population growth and is expected to continue to grow for the foreseeable future.

Roughly 64% of the residents identify as white. African Americans are the largest minority, constituting about 19% of the population. The median household income is $45,625, below the national average of $51,425. Roughly 21.5% of families live below the poverty line, compared to 10% nationwide.

Minneapolis is predominantly flat, with some varied topography. The city's elevation ranges from 686 ft to 974 ft above sea level. Like much of the Upper Midwest, the climate is defined as humid continental. Due to its northerly location near the 45th parallel, Minneapolis experiences extremely cold winters and warm to hot summers. The city receives an average of 49.9 inches of snowfall per year and 28.3 inches of rain, and has a mean temperature of 13°F in January, its coldest month (City Data 2011; Climate Zone 2003; The Weather Channel 2011b).

Minneapolis has a dense downtown that is the primary economic center for the region. Downtown Minneapolis is home to more than 140,000 jobs and experiences significant population influx during the day (City of Minneapolis 2007). One of the more unusual aspects of Minneapolis's pedestrian environment is its extensive downtown skyway network. The network, a response to the city's frigid winter weather, is a collection of enclosed pedestrian footbridges that connect buildings throughout downtown Minneapolis. The climate-controlled walkways are privately owned by individual buildings and do not operate on a uniform schedule, creating some unpredictability in terms of which segments are open at various times. In total, the skyway's network links 69 city blocks and is more than 7 miles long.

Minneapolis is also home to a well-designed and -maintained park system linked together by urban boulevards and parkways (Garvin 2002). There are several notable pedestrian and multiuse paths, including the walking paths that link the city's "Chain of Lakes." More than 16% of the city is composed of parkland, creating roughly 770 square ft of

park for every resident; every residence in the city is within six blocks of a public park (City of Minneapolis 2006).

The city features a robust transit system, operated by Metro Transit, which includes a light rail line, a commuter rail line, and 117 fixed bus routes (66 local and 51 express), as well as paratransit services. All buses are wheelchair accessible and also feature bicycle racks (MetroTransit 2011). The city boasts the second highest rate of bicycle commuting in the country: a 3.8% mode share. Bicycle racks and facilities are abundant throughout the city (Alliance for Biking and Walking in the United States 2010). The city also features a public bike share system called Nice Ride, with 60 pick-up/drop-off locations.

The city features 1,118 miles of roads and parkways, with 92% of its roadways having sidewalks on at least one side of the street. There are more than 1,800 linear miles of sidewalks (City of Minneapolis 2012). Minneapolis features another 455 miles of alleyways and an historic, tightly gridded street network (City of Minneapolis 2011). All of these factors have contributed to Minneapolis's significant pedestrian activity: Nearly 7% of residents over 16 years of age commute to work by walking as their primary mode, more than twice the national average.

Political and Institutional Context

Minneapolis has a mayor–council form of government. The City Council is composed of 13 single-member districts, or wards. The City Council is the dominant governing body, with authority over various legislative, administrative, and financial city functions. Council members are elected to 4-year terms, and ward boundaries are adjusted after each federal census to ensure that there is no more than a 5% difference in population among the wards. The council adopts ordinances and policy resolutions and can pass assessments. The mayor, who also serves a 4-year term, nominates department head candidates for council approval, proposes policy direction, proposes the annual operating and capital budget, and approves or vetoes all council actions. City departments report to the council regularly through City Council committees.

The City Council's Transportation and Public Works Committee considers infrastructure improvements and traffic issues. It works directly with the Public Works Department. The Public Works Department's mission is "to be effective stewards of the public infrastructure, and provide valued city services that contribute to public safety, economic vitality and neighborhood livability in Minneapolis" (City of Minneapolis Department of Public Works 2010). The department is divided into three primary business lines: Internal Services, which provides property and fleet services; Utilities, which includes water and sewer services, water treatment and distribution, and solid waste and recy-

cling; and Transportation, which "exists to provide a variety of safe, convenient options for moving throughout the city and within the region," and includes traffic and parking services, transportation planning and engineering, and transportation maintenance and repair (City of Minneapolis Department of Public Works 2010).

The Department of Community Planning and Economic Development is responsible for planning and sustainability within the city. Its three divisions—Planning, Housing, and Economic Development—administer planning, zoning, and development review functions, as well as targeted programs to support sustainable communities and a healthy economy.

Minneapolis sits in Hennepin County, by far the most populous county in the state. As with all Minnesotan counties, Hennepin is governed by an elected, nonpartisan Board of Commissioners. The county's Transportation Department administers all functions associated with the county highway system, including design, engineering, road and bridge operations, traffic operations, and planning.

Metro Transit, the primary transit property for the Minneapolis area, is an operating division of the Metropolitan Council, the Regional Planning Agency for the Twin Cities seven-county metropolitan area. The Metropolitan Council's mission is "to develop in cooperation with local communities, a comprehensive regional planning framework focusing on transportation, wastewater, parks and aviation systems, that guides the efficient growth of the metropolitan area" (Metropolitan Council 2011).

The Minnesota Department of Transportation administers the state's Municipal State-Aid for Local Transportation program. The program identifies key streets in 144 Minnesota cities and provides financial assistance for the construction and maintenance of those streets. Funding is provided from constitutionally dedicated, transportation-related taxes, including the state's gas tax, and is distributed based on a statutory formula (Burress 2010). Minneapolis was one of four designated pilot communities that received funding from the federal transportation statute SAFETEA-LU's Nonmotorized Transportation Pilot Program (NTPP), which was meant to demonstrate the extent to which walking and bicycling can represent a significant transportation solution in certain communities. Under NTPP, 100% federal share funding was made available for qualifying projects to construct nonmotorized transportation infrastructure facilities. In Minneapolis, Transit for Livable Communities—a local nonprofit organization that advocates and encourages transit, walking, bicycling, and thoughtful development in the Twin Cities region—was chosen to administer the NTPP. The NTPP ended in 2010, and the funds were distributed for various walking and biking-oriented projects and programs. Minneapolis' NTPP infrastructure projects were primarily bicycling focused. However, the city's Pedestrian Master

Plan (see below) and several other pedestrian programs and projects were funded by NTPP.

The city completed its comprehensive plan, The Minneapolis Plan, in 2000. The plan's transportation section included 12 objectives and supportive implementation strategies that were guided by the goal of achieving a balanced transportation system, meant "to strengthen transit and other non-automobile forms of transportation, such as bicycles." The intent was to "build, maintain, and require a pedestrian system which recognizes the importance of a network of private and public sidewalks which achieve the highest standards of connectivity and amenity" (City of Minneapolis 2000). The plan's update, 2009's The Minneapolis Plan for Sustainable Development, continued multimodal transportation as a central theme.

Access Minneapolis

In the early 2000s, Metro Transit and the city were seeking a way to improve bus travel times in downtown Minneapolis. Congestion and other factors were causing operational difficulties for the agency and bus transit users. Metro Transit and the city recognized that potential improvements for bus travel times would require them to work closely with other agencies and downtown stakeholders and to employ a multimodal approach.

At the same time, the city and the downtown business community had concerns about congestion, transit service, and the quality of the pedestrian environment in downtown. The Department of Public Works was interested in developing a transportation action plan for the city that would lay out a guide for addressing these key transportation problems and would result in a more multimodal transportation system. The city brought together Metro Transit, the Metropolitan Council, Hennepin County, the Minnesota Department of Transportation, the Downtown Council (business organization), and a Project Steering Committee of 30 representatives of various stakeholders to identify specific actions that would address these transportation problems. Each of the partnering agencies contributed funds for a broad-scale transportation planning effort, with the agreement that the product would emphasize transit related-issues, with particular focus on downtown Minneapolis.

This broad-scale initiative began in earnest in 2005, as the partnering agencies took steps that eventually developed as six distinct components. Organized and coordinated under the umbrella of Access Minneapolis, those components were (1) a Downtown Action Plan; (2) a Citywide Action Plan; (3) Design Guidelines for Streets and Sidewalks; (4) a streetcar planning study; (5) a Pedestrian Master Plan; and (6) a Bicycle Master Plan. Each of these components was intended to identify specific strategies that could be implemented within a 10-year time frame.

To shape these initiatives, the partnering agencies developed a Vision Statement. The vision acknowledges that the city must remain walkable to be both regionally and nationally competitive. It includes concepts regarding the promotion of multimodal systems, providing good transportation choices, and supporting an urban center that is a great place to live, work, play, visit, and conduct business. The vision specifically acknowledges that while "all modes of transportation are important, transit is critical for maximizing the people-carrying capacity of the transportation system."

The three components of Access Minneapolis are discussed in this case study—the Downtown Action Plan, the Design Guidelines for Streets and Sidewalks, and the Pedestrian Master Plan.

Downtown Action Plan

Driven by the desire to solve congestion and transit access problems, the partnering agencies set out to develop a Downtown Action Plan to provide guidance on action items for incorporating the policies contained in the Minneapolis Plan over a 10-year time frame.

With the city of Minneapolis in the lead, a Project Steering Committee was formed that included representation from each of the partnering agencies, as well as representatives of the downtown business community, residents, business associations, neighborhood organizations, and advocates of transit riders, pedestrians, and bicyclists. The committee provided policy direction and review for the Downtown Action Plan.

The development of the Downtown Action Plan was guided by the vision, "in most cases, it is not feasible or desirable to increase the curb-to-curb width of roadways in the city. However, there are many opportunities for improving the operational capacity of the transportation system without street widening" (City of Minneapolis 2007). In that spirit, a layered analysis of the downtown transportation system was undertaken to assess ways to meet the area's multimodal needs. The team considered which streets (1) needed modification to encourage more walking and biking, (2) were important for prioritizing transit service, or (3) needed curbside changes and roadway management strategies to address property access needs (such as access to parking areas and deliveries). The team also studied freeway access and traffic operations into, out from, and circulating within the downtown area.

Several public meetings were held in downtown settings, where public input was solicited and recorded. Targeted outreach was also undertaken to the Downtown Council (a business organization), the Building Owners and Management Association, the Downtown Minneapolis Transportation Management Organization, and other key stakeholders.

This outreach was critical to building broad-based support for the final plan.

The Downtown Action Plan gave significant consideration to the pedestrian realm in downtown Minneapolis. It recognized that "all streets in downtown need to support and encourage more people to walk, to walk more often, and to walk farther" (City of Minneapolis 2007). The plan's pedestrian recommendations are based on a primary pedestrian network at the street level that links major cultural, entertainment, shopping, and recreational destinations and transit streets, as well as connections between downtown and adjoining neighborhoods. Action priorities were targeted to fill gaps in the network and widen sidewalks where possible.

The plan includes eight Pedestrian Action Items such as, "Design and construct a 13th Street plaza between Nicollet Mall and Convention Center," and "Provide an improved pedestrian connection between Elliott Park and Downtown" (City of Minneapolis 2007). The plan also includes recommendations for improving the downtown skyway network, providing guidance on where expansion should be targeted, where and how physical and visual connections should be improved, as well as recommendations for wayfinding and for improving access between the skyway and the street level pedestrian realm. The plan includes a matrix that describes action items and identifies the responsible agency for leading the action, as well as required partner agencies, an estimated capital cost, a specified time frame, and any unresolved issues.

Many of the plan's transit recommendations also directly supported an improved pedestrian environment. For instance, the plan recommended improving Nicollet Mall, downtown's premier pedestrian street, by moving commuter express buses off Nicollet Mall and converting the remaining local buses to 100% hybrid electric technology to reduce noise and exhaust fumes on the mall. It also recommended implementing a free ride service on Nicollet Mall at least every 10 minutes using local bus routes to supplement short walking trips within downtown. The plan also recommended improving two parallel streets to Nicollet Mall to serve increased commuter express bus volumes, by constructing double-wide bus lanes, wider sidewalks, enhanced bus stop facilities, and trees. Finally, the plan recommended that Hennepin Avenue and 1st Avenue North, two streets that have heavy pedestrian traffic and are part of the city's entertainment district, be converted from one-way to two-way streets. These changes supported the significant growth that had recently occurred in downtown residents and the recognition that the streets did not serve a significant number of through trips. Both streets also have facilities for bicycling. All of these improvements have been implemented.

Among the key philosophies of the Downtown Action Plan were that it had to be a multimodal approach, address all downtown streets, and prioritize modal needs on different streets.

Downtown streets do not have the physical and operational capacity to efficiently serve all modes on all streets. While most stakeholders agreed with the need for a multimodal approach, not everyone agreed on how and where different modal needs should be prioritized. By taking a downtown-wide, multimodal approach, stakeholders were able to understand how improvements for one mode impact improvements for other modes and ultimately support a multimodal plan.

A significant portion of the recommendations in the Downtown Action Plan have been implemented, including the 13th Street Pedestrian Gateway project, which provided a convenient and safe pedestrian connection between the convention center, Nicollet Mall, the Loring Greenway, and other destinations. Of those that have not been implemented, several are in the process of securing funding and/or awaiting imminent implementation. To that extent, the Downtown Action Plan has been largely successful: Its recommendations have truly changed downtown's transportation system, providing better and safer pedestrian linkages to popular destinations and to improved transit services.

One of the keys to this success hung on the participation and engagement of partnering agencies and key stakeholders. The city, through the Department of Public Works, actively incorporated these agencies into the process, and because they contributed funding, each had a vested interest in the outcomes. Support from the downtown business community and the city council and mayor for the plan as a whole was critical to achieving a consensus on the recommended actions and, ultimately, their successful implementation.

Finally, quick, early successes were important to the overall implementation. Many of the plan's recommendations hinged on the reconstruction of two downtown streets to implement dedicated bus lanes. Metro Transit/Metropolitan Council and the Minnesota Department of Transportation were able to secure a federal Urban Partnership Agreement funding grant to implement a number of regional transportation improvements, including the dedicated bus lanes in downtown. Once this success was realized, the implementation of other action items was accelerated.

Design Guidelines for Streets and Sidewalks

As the Downtown Action Plan process began in earnest, available right-of-way or cross-section constraints were quickly identified as a challenge in downtown and city-wide. In trying to evaluate what would be possible within a given right-of-way based on agreed-upon modal priorities, it became clear that design guidelines would be necessary for adequate consideration of multimodal opportunities.

In 2005, as this initiative was beginning, the Complete Streets movement had not yet been fully embraced nation-wide, but many principles of that movement were being

pursued by agencies around the country and were packaged under various descriptions. In Minneapolis, the Context-Sensitive Solutions philosophy captured the city's desire to approach the transportation system from a multimodal perspective and find opportunities for greater emphasis on walking and bicycling in street design.

Rather than rely on conventional functional classification of the street network, the goal of the design guidelines was to identify street typologies that took into account the transportation needs of the street, the land use context, and the multimodal needs of the corridor. The development of the guidelines was itself guided by the notion that "elements of street design should change as the context of the places that a street passes through change" (City of Minneapolis 2008). Where traditionally, streets were designed based on traffic volumes and their functional classification, the design guidelines created a framework for the classification of streets based on these identified typologies.

The design guidelines framework identifies place types such as Activity Centers, Commercial Corridors, and Transit Station Areas, as well as street design types such as Commuter Streets, Community Connectors, and Parkway Streets. The guidelines describe desirable design characteristics across the criteria for those typologies. The framework also includes a process that incorporates stakeholder input at each key step in the project design process, which includes development of a citizen view of the street, agreement, collection of existing conditions data, selection of the best cross section, and the recommended design.

As with each of the citywide Access Minneapolis initiatives, community engagement was conducted at the neighborhood level throughout the development of the guidelines. The city was divided into five sections: downtown and four city quadrants. Public meetings were held in area of these areas to solicit input on the Design Guidelines. The team also conducted outreach to neighborhood organizations and civic groups.

The *Design Guidelines for Streets* and *Sidewalks* incorporates Complete Streets principles and is intended to be a "living document." The 13 chapters will be revised and added to, based on experience, lessons learned, and new information. To enable this flexibility, the guidelines were not adopted by the City Council. Rather, to implement the guidelines, the city relied on the formal adoption of another Access Minneapolis initiative, the Citywide Action Plan, which states as a matter of policy that the city should incorporate the *Design Guidelines for Streets* and *Sidewalks* into all of its infrastructure projects. This enables the application of the guidelines and maintains the flexibility to adapt the guidelines as new information becomes available.

Several chapters, including Street Furniture, and Street Trees, and Boulevards, are still under development. Chapter 10, published in 2009, focuses on Pedestrian Facility Design and includes detailed guidance on creating pedestrian networks (with specific policies for new streets, street reconstruction, and infill development) and guidance on designing the pedestrian zone, street corners, bus stops, and street crossings, as well as guidance on wayfinding, and site planning.

The city views implementation of the design guidelines as a work in process. The Department of Public Works has initiated a process whereby, prior to project design, its Transportation Planning group assembles a Project Overview and Rationale document. This document provides the land use context of the project, the multimodal needs of the corridor, and includes a preliminary cross section that offers the city's planning perspective and a potential starting point for design. This document always incorporates the principles of the Design Guidelines for Streets and Sidewalks. As a result, staff has learned to understand and accept the guidelines' perspectives.

One of the challenges of implementing the *Design Guidelines for Streets* and *Sidewalks* is the relationship of the guidelines to the Minnesota State Aid standards. Approximately 19% of roadway miles in Minneapolis (in addition to county- and state-owned roadways) are paid for in part with Municipal State Aid (MSA) funds. The design of MSA streets is governed by design standards that are established in state law (Minnesota Rules 8820), and the design must be approved by the state if MSA funds are to be used. The *Design Guidelines for Streets* and *Sidewalks* provides more flexibility in street design than the MSA standards. There is often considerable debate within Public Works about how to reconcile the design guidelines' recommendations for things like a minimum 12-ft-wide pedestrian zone with MSA standards for lane widths and number of lanes within a constrained urban right-of-way. Variances from the MSA standards are possible and have been received on several projects to accommodate multimodal needs, but they must be approved by a state variance board, which adds time and uncertainty to the design process. There are active conversations within Minneapolis and around Minnesota regarding ways to introduce flexibility to the State-Aid Guidelines.

Pedestrian Master Plan

Coincident with the selection of Minneapolis as a federal NTPP pilot city, the City Council initiated a Pedestrian Advisory Committee in 2006. The committee is composed of residents and business owners with an interest in promoting walking and improving the pedestrian environment. The Pedestrian Advisory Committee advises the City Council and mayor on policies, programs, and actions for improving pedestrian safety, mobility, accessibility, and comfort. It builds on a tradition of advisory committees of this nature—a Bicycle Advisory Committee had been organized a decade earlier and an Advisory Committee for People with Disabilities two decades earlier.

With several of the Access Minneapolis components under way, the city, the NTPP administrator (Transit for Livable Communities), and the Pedestrian Advisory Committee thought it would be prudent to develop a Pedestrian Master Plan (to be paid for with NTPP funds, along with additional funding from Blue Cross Blue Shield of Minnesota). The plan was prepared by the Department of Public Works with support and input from the Pedestrian Advisory Committee and a technical staff team featuring representation from multiple city departments. Additional community outreach was performed through a series of well-attended public meetings and an online survey.

The Pedestrian Master Plan was created to "provide guidance on making Minneapolis a great walking city where people choose to walk for transportation, recreation and health" (City of Minneapolis 2009). The Department of Public Works was tasked with assessing the existing pedestrian conditions in the city, assessing the effectiveness of existing policies and practices, prioritizing improvements on a 20-year horizon, developing a pedestrian design guide, and recommending funding and implementation strategies within the plan.

The Pedestrian Master Plan delivers on each of these assignments. The pedestrian design guide activities were incorporated into the Design Guidelines for Streets and Sidewalks and constitute Chapter 10: Pedestrian Facility Design. The other tasks are addressed directly in the Pedestrian Master Plan, which is organized into seven goals to improve the pedestrian environment. Each of the following goals is the subject of a dedicated chapter that includes objectives and implementation strategies to accomplish those objectives:

- A well-connected walkway system
- Accessibility for all pedestrians
- Safe streets and crossings
- A pedestrian environment that fosters walking
- A well-maintained pedestrian system
- A culture of walking
- Funding, tools, and leadership for implementing pedestrian improvements.

A substantial portion of the recommended strategies in the Pedestrian Master Plan have been implemented. The Pedestrian Master Planning effort also provided significant information and guidance to the other Access Minneapolis initiatives, as evidenced by the inclusion of chapter 10 in the Design Guidelines for Streets and Sidewalks and various recommendations incorporated in the downtown and citywide action plans.

Conclusion

Access Minneapolis demonstrates the benefits of cooperative engagement and participation among relevant agencies.

It shows how a committed pragmatic approach can lead to the development of a collection of tools that focus on specific aspects of improving the pedestrian environment, and combine to provide a comprehensive approach. Access Minneapolis began with a targeted focus on improving transit and multimodal options in downtown Minneapolis. That effort necessitated the development of design guidelines and grew to incorporate a citywide action plan, a streetcar study, and the development of pedestrian and bicycle master plans.

Each of these efforts was guided by the common philosophy of multimodalism and the need to support transit, walking, and bicycling, as stated in the city's comprehensive plan. These efforts also benefited from their rapid succession and the participation of consistent players. Though each initiative was undertaken independently, each involved the participation and guidance of partnering agencies, a project management team, and a steering committee. This consistency assisted with the efficient development of all of the studies and plans and contributed to the final result: a well-coordinated collection of plans and initiatives that are improving the pedestrian environment in downtown and throughout Minneapolis.

Olympia, Washington

Pedestrian Environment

Olympia is the capital of Washington State. The city, located at the southernmost reach of Puget Sound, is home to just over 45,000 people. It encompasses more than 19 square miles of land area, with a population density of roughly 2,540 people per square mile. More than 83% of the population is white. The next most populous racial group, Asian, is about 6% of the population. The city's role as the state capital contributes significantly to its character, as does the Evergreen State College and its 4,800 students. Olympia boasts a well-educated workforce, a stable economy, and a culture of civic engagement.

The city was named for the Olympic Mountains, which can be seen to the north on a clear day. While foothills and mountains surround Olympia, the city itself is rather flat. Cool, wet winters and mild summers characterize the climate. January is typically the coolest month, but temperatures rarely dip below 30°F. The city has an average annual precipitation of more than 50 inches. Cloudy or partly cloudy skies dominate almost 300 days of the year. Nonetheless, outdoor recreation is popular in Olympia. The city's network of scenic and accessible hiking trails is well used.

Olympia originated around one central core comprising the downtown and harbor area. Downtown remains a central destination for work, leisure with easy pedestrian access to the waterfront, and convenient bus service. Numerous works of public art extend beyond downtown throughout the city,

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greatly enhancing the pedestrian environment. The Capital Mall also serves as a regional shopping destination.

After World War II, autocentric suburban development patterns began to dominate in Olympia. In the 1980s, the city experienced a burst of growth. At that time, it was one of the fastest growing areas of the nation. During this era, low-density subdivisions were built at a rapid rate along rural roads. These neighborhoods were poorly connected to the rest of the city's street and transit system, and few had any sidewalks to speak of. The result has been a road system that can be challenging for all but automobile users.

The car is indeed the most common mode of travel in Olympia. The majority (80.5%) of employed residents over age 16 travel to work by car, truck, or van. About 7.5% bike or walk to work, and 6% use public transportation. Sidewalk infrastructure has improved in the past decade, but the city's decentralized and fragmented development patterns have decreased the viability of walking as a primary means of transportation.

Political and Institutional Framework

Olympia operates through a council–manager form of government. The City Council has seven members, elected to 4-year terms. The mayor holds the first City Council position and provides leadership, but his or her voting authority is equal to that of the other council members. The council has the power to set policy by adopting resolutions, standards, plans, and laws. The council also hires the city manager, who administers the daily tasks of city government and advises the council on policy decisions. The city manager oversees eight city departments and is responsible for administering Olympia's budget of just over $100 million.

Community members are appointed through a system of volunteer advisory boards, committees, and commissions to advise the council. Currently eight of these advisory bodies have been appointed by the city council: Arts Commission, Design Review Board, Heritage Commission, Lodging Tax Advisory Committee, Planning Commission, Utility Advisory Committee, and the Bicycle and Pedestrian Advisory Committee (BPAC).

The primary agency responsible for creating a safe pedestrian environment is the Public Works Department. This agency is by far the largest in Olympia's city government. It is responsible for overseeing the city's transportation and utilities systems. Its responsibilities are broken into four lines of business: Technical Services, Transportation, Water Resources, and Waste Resources. Engineers from the Technical Services division oversee capital projects. Transportation staff is responsible for maintaining more than 217 miles of road. They also manage sidewalk repair, snow and ice control, streetlights, and traffic signals. More than $5 mil-

lion of the agency's budget is devoted to the transportation line of business.

The Public Works Department works closely with the Community Planning and Development (CP&D) Department to be sure that land use and transportation planning are well integrated. The two agencies collaborate on initiatives such as the Comprehensive Plan, the Transportation Impact Fee (TIF) program, and the city's street design standards. The CP&D Department is responsible for parking services, preservation, land use planning, construction permitting, code enforcement, urban forestry, neighborhood programs, and housing and social services. One of the main goals of the agency is to serve the community by ensuring smart growth.

Several other entities play a role in creating a safe pedestrian environment. The Parks, Arts and Recreation Department oversees almost 1,000 acres of park land, 16 trail miles, and more than 23,000 linear ft of waterfront. The BPAC has been advising the City Council on nonmotorized transportation issues for more than 20 years. BPAC members work closely with Public Works Department staff to develop programs and policies according to public priorities. Due to the structure of Olympia's government, the priorities of the City Council are an important factor in directing city policy. For several decades, there was great consistency within the City Council. Though there have been recent changes in the makeup of the council, its priorities have not changed dramatically. It has consistently focused on maintaining downtown housing, denser housing throughout the city, and the implementation of a downtown parking strategy.

A major priority for the current City Council is the update of Olympia's Comprehensive Plan, which serves as the city's blueprint for managing growth. It addresses a list of policy areas related to the pedestrian environment, including transportation, land use and urban design, and parks, arts, and recreation. The transportation section of the plan outlines visions and goals for the city's transportation system, including integrating land use and transportation, making connections, focusing on people over cars, and transportation demand management (TDM). These goals will likely apply to the updated plan, with an increased focus on downtown, high-density corridors, neighborhood planning, and environmental stewardship.

Parks and Pathways Funding Measure

In recent years, the improvement of sidewalk infrastructure in Olympia has accelerated, thanks largely to a sidewalk funding measure approved in 2004. The measure called for a 3% increase in the private utility tax to pay for parks and recreational facilities. One-third of the proceeds were designated for sidewalk construction, and the remainder was dedicated to the acquisition and development of parks and open space. This measure increased funding for

sidewalk construction from $150,000 to approximately $1 million per year.

Prior to the passage of the funding measure, Olympia faced a significant sidewalk deficiency as a result of decades of decentralized development. Sidewalks had been neglected as the city grew, and by the 1990s many residents found it difficult to walk to key destinations or for recreation. At that point, more than half of the existing major roads in the city were without sidewalks. Olympia's 1994 Comprehensive Plan established walkability as a key planning goal. Not too long after that, the BPAC initiated an effort to advance that goal by addressing deficiencies in the pedestrian environment. The BPAC identified the lack of safe walking routes as the primary deficiency in the city's pedestrian environment and began a project to develop a sidewalk inventory and rank sidewalk construction needs. The project began with a focus on filling gaps in routes to schools, often along small local access streets. Eventually, committee members decided to broaden the scope to look at safe routes to transit and employment destinations as well. The committee spent countless hours compiling what became the first complete sidewalk inventory for Olympia's major street network. It then established a numeric scoring system for ranking gaps in the sidewalk network, effectively prioritizing projects for the future.

The findings of the BPAC project were presented to the City Council, in the first significant articulation of the need for sidewalks in the city. The BPAC members' time commitment alone demonstrated significant community support for improving pedestrian infrastructure, and the data truly shed light on the severe lack of sidewalks. At the then-current funding level, it was estimated that constructing a sidewalk on one side of major roads in the city would take more than 300 years.

While the BPAC was studying sidewalk needs and developing a sidewalk plan, the Olympia Parks and Recreation Advisory Committee was developing a new parks plan. The City Council approved both the sidewalks and the parks plans in 2003 and began considering funding mechanisms. Sidewalk advocates formed Walkable Olympia Now (WON!) to mobilize walking activists and push for the inclusion of sidewalks in the parks plan funding measures. As the effort to secure funding for sidewalks gained momentum, it appeared that the two groups were directly competing for resources.

The Olympia Parks and Recreation Advisory Committee had already planned to recommend a 2% utility tax increase to fund the improvements outlined in the parks plan. Washington State law requires a voter referendum to implement a tax increase of this nature. Parks advocates worried that raising the tax increase percentage to include funds for sidewalks in the park funding measure would decrease voter support. Tension grew between the two groups. The city decided

to initiate a ballot measure survey to gauge voter support for the measure. After significant lobbying efforts from WON!, two City Council members insisted that the survey include questions about sidewalk funding in addition to parks funding. The results of the poll marked a turning point: 42% of voters supported a 1% tax increase for sidewalks alone, 49% supported a 2% increase for parks alone, but 57% supported a 3% tax increase to fund park and sidewalk projects. Suddenly the sidewalks became the margin of victory.

Recognizing the opportunity for collaboration, the two groups formed a combined campaign called Olympians for a Livable Community: Parks, Open Space, and Sidewalks (OLC). Despite the promising findings of the survey, OLC knew that gaining voter approval for any tax increase would be challenging. OLC members launched a strategic outreach effort that included yard signs, postcards, brochures, and flyers. Volunteers helped distribute materials and spoke to individual stakeholder groups throughout the city. OLC also engaged potential opposition groups early in the process to dispel fears and gain their support. The outreach efforts proved successful; when the ballot measure was proposed in September 2004, just over 57% of voters supported the 3% increase to fund parks and sidewalks.

With a greatly increased sidewalk construction budget, the Olympia Public Works Department set to work. The city manager created a small staff team to lead the sidewalk construction projects. The sidewalk prioritization tool produced by the BPAC proved vital in project selection. The city began by filling sidewalk gaps in key areas, focusing on pathways to common destinations, such as schools or transit hubs. Each new sidewalk included a "Parks & Pathways" logo to help residents associate the new sidewalks with the funding measure.

The funding measure has greatly accelerated sidewalk construction. From 2005 to 2010, the Parks & Pathways program has completed nine sidewalk projects, significantly increasing Olympia's walkability. Today, for example, students from Washington Middle School can safely walk to school from any part of the school's service territory. The number of students walking and biking to school has increased, and traffic congestion around the school has decreased as fewer students are dropped off or picked up by car.

Another sidewalk project funded through the financing measure centered on a steep, winding road called San Francisco Avenue. The road served as the only major connector between the downtown core and a residential district, but few pedestrians used it due to lack of walking infrastructure and poor visibility for motorists. The project began with an extensive outreach effort to establish buy-in among stakeholders. Most residents supported the project. Beyond connecting their neighborhood to downtown, the proposed sidewalk incorporated public art elements and passed several key destinations, including a school and a popular

local bakery. The bakery owners also supported the project, despite the fact that it required a new parking configuration that would cause their business to lose several parking stalls. In a true demonstration of the communitywide commitment to walkability, the owners stated that they supported the project because they valued safe waking routes for students and residents. The new sidewalk has significantly increased walking along San Francisco Avenue. The city plans to build more than 13 miles of new sidewalks over a 20-year period through the Parks & Pathways program.

Olympia made an effort to stretch sidewalk funding dollars by exploring the use of porous concrete. Because Olympia's climate is extremely wet, the conveyance and treatment of stormwater runoff must be considered in any project that involves a paved surface. Stormwater mitigation infrastructure is costly and can eat up a significant portion of project budgets. A dedicated stormwater engineer within the Public Works Department recognized the sidewalk program as an opportunity to explore porous concrete materials for the first time. These materials eliminate the need for costly stormwater mitigation infrastructure. This staff member took the initiative to develop a mixture for the porous concrete, and wrote the materials requirements into the bids for the sidewalk projects. Local contractors had less experience working with the material than the city, but the two parties worked together to get the mixture right. The process was by no means perfect. On a few occasions, sidewalk panels had to be replaced. However, now that the initial difficulties have been surmounted, both the city and local contractors are experienced in the use of porous concrete. Use of this material reduces stormwater mitigation costs and supports the city's sustainability goals. Integrating this new material into the fabric of public works projects has the potential to benefit the city for years into the future.

Olympia's Sidewalk Funding Measure demonstrates the value of pursuing the proper funding mechanism. Had the Olympia City Council proposed a bond measure to the public, state law would have required a 60% vote. A utility tax increase did not require this super-majority and was thus a more feasible option.

Transportation Impact Fees

In 1990, the Washington State Legislature passed the Growth Management Act (GMA). The goal of the measure was to address the negative impacts of uncoordinated growth through comprehensive and inclusive land use planning. Under the GMA, counties and cities of a certain size and growth rate are required to implement plans and regulations to address the potential negative impacts of growth within the community. These efforts must align with the 14 goals laid out in the GMA, which include the consideration of impacts on transportation infrastructure, housing, local economies, and the environment.

In accordance with the GMA, the city of Olympia has charged Transportation Impact Fees (TIFs) to developers of new construction since 1995. The fees are used to offset the costs of the transportation system improvements that new growth necessitates. The Public Works Department determines the schedule and use of the fees. The CP&D Department collects the fees from developers, typically as part of the building permit process. While TIF revenues cannot be applied to stand-alone pedestrian projects under the current state guidelines, the city has successfully leveraged the fees to enhance the pedestrian environment through the development of multimodal street standards. The standards govern new transportation and frontage improvement projects in both the public and private sectors, including all improvement projects financed with TIFs.

The street standards are a part of the Olympia Engineering Design and Development Standards, developed by the Public Works Department and enforced by the CP&D Department. In keeping with the goals laid out in the comprehensive plan, walkability is heavily emphasized. The current standards require design elements based on the functional classification of streets. These elements include sidewalks on both sides of new streets, pedestrian-scaled street lighting, planter strips, and street trees. For each road classification, the standards focus on maintaining the minimum road width possible and also set maximum speeds. Curb bulb-outs are required on major roads wherever on-street parking exists. The development of these pedestrian-friendly street standards has allowed the TIF program to evolve from a tool to finance vehicle capacity improvements to one that significantly contributes to systemwide improvements for multiple transportation modes.

While the street standards have been the primary tool, the city has also leveraged TIFs to enhance the pedestrian environment through strategic allowances for TIF reductions. Developers who include TDM and commute trip reduction (CTR) measures in their project proposal may reduce their TIF costs by up to 20%. Reduction allowances are offered in exchange for a number of actions, including construction of walkways to nearby arterials, installation of bike lockers or showers, and construction of on-site walk or bikeway connectors to existing transportation infrastructure.

Olympia residents appear to recognize the value of the TIFs, but the program still faces numerous challenges. For one, winning cooperation from the building and development community is difficult. Developers frequently dispute city calculations for the level of impact their project has on the transportation network. In one instance, a development firm sued the city after the city rejected its independent fee calculation for a large office construction project. The case went as far as the Washington State Supreme Court, which ultimately upheld the city's TIF calculation decision. Ultimately, impact fees present the challenge of balancing the desire to attract growth and the need to pay for it.

Another challenge is predictability of TIF schedules and revenues. Because impact fees are tied to growth, they can vary significantly from year to year. This variability makes project planning difficult for developers and the Public Works Department alike. It also makes it tough to establish realistic public expectations for project timelines. State law mandates that Olympia outline all impact fee projects for a 6-year planning horizon in the city's Capital Facilities Plan. Assigning impact fee projects to specific years leads to public expectations about when projects will begin, which can be problematic when project schedules change due to growth rate fluctuation.

Despite these challenges, Olympia has been able to leverage TIFs for multimodal improvements due to a comprehensive commitment to securing resources for nonmotorized transportation improvements throughout local and regional planning processes. On a local level, the TIF program is dependent on close collaboration among several agencies. The Public Works Department and CP&D Department work together to administer the TIF program and facilitate proper enforcement of the street standards. The Thurston Regional Planning Council, Olympia's regional transportation planning authority, also plays a role. The Thurston Regional Planning Council's 2025 Regional Transportation Plan provides a supportive framework for the city's multimodal street standards. For example, the plan establishes a regional commitment to limiting road widening, effectively facilitating local efforts to encourage infill development, reduce vehicle dependence, and align land use and transportation planning.

Working from this foundational value of multimodal transportation planning, the Public Works Department is currently on track to increase the role of TIFs in financing nonmotorized transportation improvements. The recently adopted Transportation Mobility Strategy (TMS), discussed in more depth below, outlines several recommendations to this end. Most notably, it suggests that the city revise the TIF eligibility list to include nonmotorized improvements, particularly sidewalk routes to transit destinations.

Transportation Mobility Strategy

Olympia's TMS is a guidance document that makes specific recommendations for enhancing the city's multimodal approach to transportation planning and development. Multimodal planning is not new to Olympia. The city's comprehensive plan clearly establishes the goal of achieving a balanced transportation system for all users; it tasks the city with reducing auto dependence and supporting transit, bicycle, and pedestrian travel. The purpose of the TMS is to suggest how the city might continue its effort toward multimodal planning to give more attention to alternative modes and development patterns that support efficient travel.

The TMS was prepared under the leadership of the Public Works Department and the Ad Hoc Technical Advisory Committee. It takes direction from the vision and goals of Olympia's Comprehensive Plan, existing city transportation and land use plans, and new data. Building on that base, the TMS makes suggestions about new policies and policy changes that would allow the city to increase its consideration for nonmotorized travel.

To encourage integration of planning *across* modes, the TMS is not organized by individual transportation mode. Instead, it is organized around six policy themes: Community Transit Network; Complete Streets; Connectivity; TDM; Funding; and Concurrency, TIF, and State Environmental Policy Act. Each theme is discussed in detail and supported with an initial work plan for the city, based on outcomes, outputs, and action items.

The City Council accepted the TMS in August 2009. Many elements of the strategy are currently being integrated into the city's comprehensive plan update. In addition, the Public Works Department has begun to implement parts of the work plans for the various policy themes.

The TDM policy theme fits into the context of state and local efforts to reduce demand for single-driver trips. In 2006, the Washington State Legislature passed the Commute Trip Reduction Efficiency Act, requiring Olympia to develop and implement CTR measures. Olympia's 2008–2011 Commute Trip Reduction Plan identifies a number of strategies and sets measureable goals for reducing single-driver trips. The TMS suggests that the city build on existing efforts and concentrate on parking policy, telecommuting, walk-to-school programs, and public education programs to raise awareness about alternative modes of travel.

The Public Works Department secured a 2-year grant from the Washington State Department of Transportation to implement several of the initiatives recommended in the TDM work plan. One program focused on the city's downtown core. This area has the greatest potential for CTR due to its ample pedestrian and transit options. The Downtown Commuter Program focused on small employers with fewer than seven employees, most of whom work for minimum wage. Because of their small size, these employers are not affected by the state CTR act. They are also typically unable to provide their employees with benefits. Through the state grant, Olympia was able to offer this pool of workers free bus passes through their employers. The program was incredibly popular. The Public Works Department estimates that it removed at least 125 cars from the downtown core per day, which is significant for a city the size of Olympia. Other initiatives funded through this grant included a comprehensive walking map of the city and the popular Urban Cycling workshops, which taught adult bicyclists urban cycling skills. These efforts helped establish a strong community ethic for active transportation.

Connectivity is another key policy theme outlined in the TMS. Decades of autocentric development patterns in the 1940s–1980s left Olympia with many poorly connected subdivisions, and the city now has a framework in place to encourage connectivity in transportation and land use planning. The city's 1994 Comprehensive Plan establishes the need for a transportation system that makes connections and encourages a development approach that moves away from low-density sprawl. Olympia's street standards also emphasize connectivity. Policies in the current standards call for a dense interconnected street network and state that dead ends and cul-de-sacs should be avoided.

Despite this framework, connectivity has improved rather slowly. The TMS recommends that the city continue creating connections when development occurs and establish a connectivity index that will allow the city to target investments and track progress. Implementing the connectivity work plan requires the transportation staff at the Public Works Department to work closely with planners from the CP&D Department. As a first step, the Public Works Department would like to use a route directness measurement tool. Using GIS technology, the tool isolates a particular tax parcel and demonstrates how well it is connected to the rest of the city. Levels of connectivity are illustrated through a color code, which creates a clear visual for planners and the public. In this way, the route directness measurement tool helps establish the state of the current system, effectively establishing a baseline for improvement.

One challenge that can impede connectivity initiatives is lack of public support. Many Olympians recognize the value of a connected transportation system, but cul-de-sacs are still common in residential areas. Neighborhoods typically oppose efforts to connect quiet, dead-end streets to the larger transportation network. The Public Works Department acknowledges that connectivity projects must be approached in a thoughtful, sensitive way. A tiered approach is sometimes necessary; in situations where connectivity is simply too controversial, the agency looks to alternative solutions such as bike and pedestrian pathways in lieu of roadway connections.

The city has also made progress toward implementing measures in the Concurrency, TIF and State Environmental Policy Act work plan, although these efforts are still in the early stages. In this policy area, the TMS recommends that Olympia consider revising its concurrency program, a state-mandated program that requires local governments to have a plan to build or finance the transportation infrastructure necessary to maintain a specified level of service. Two other Washington cities, Redmond and Bellingham, have adopted plan-based concurrency programs that measure level of service based on person trips rather than automobile trips. These programs emphasize achieving longer term comprehensive plan and GMA goals. Olympia is studying Bellingham's model to see if the city can implement a similar program.

The TMS also suggests that nonmotorized infrastructure improvements be added to the list of projects that can be funded with TIFs. Olympia is currently studying a successful model from the city of Bellingham. Bellingham's TIF program breaks the city into zones and assesses the network needs for all modes within each zone. Developer fees can then be applied to address system insufficiencies across modes. This program structure meets many of Olympia's goals, and the city may adopt elements of Bellingham's program in the future.

Because the recommendations in the TMS arise from previously agreed-upon community values, the suggestions have been well received by planners and residents alike. Integrating the TMS policy recommendations into the comprehensive plan has not been controversial. Rather, content from the TMS will serve to strengthen the previous plan's multimodal direction, putting more emphasis on transit and connectivity in the updated version. Olympia's success in integrating and implementing the TMS thus far is the result of consistent cooperation among government agencies, city council members, advisory committee members, and stakeholders. The existing institutional and culture support for multimodal planning provided a hospitable framework for the TMS recommendations, and suggests that the city will continue to strengthen its consideration of alternative modes of transportation in future planning activities.

Conclusion

Olympia's efforts to enhance the pedestrian environment illustrate the value of broad support for multimodal planning. In reaction to a low-density, poorly connected development pattern, Olympia's comprehensive plan identified the support of nonmotorized transportation as a key goal more than two decades ago. The goal has remained a priority in subsequent regional and local planning activities, such as the regional transportation plan, the city street standards, the CTR plan, and the TMS. The initiatives described above are the result of this persistent approach to institutionalizing the consideration of nonmotorized modes in city planning over many years.

Support for the advancement of nonmotorized transportation modes extends to all corners of Olympia's population. Voters, activists, City Council members, state and regional policymakers, and city government employees have all had a role in furthering efforts to enhance the pedestrian environment. The passage and implementation of the Parks and Pathways Funding Measure illustrates the depth and value of community support for walkability.

Olympia's pedestrian environment benefits from the combination of a dedicated sidewalk project funding source and a TIF program that aims to support alternative modes of transportation through Complete Streets capacity improve-

ments. Olympia demonstrates the value of this type of financial commitment to improving walkability, and shows how creative approaches can allow cities to capitalize on available funds. Securing these financial resources would likely not have been possible without the broad support for the creation of a more walkable city among stakeholders at every level.

CASE STUDY LESSONS LEARNED

Introduction

These four case studies illustrate several key lessons. First, there is no one universal approach to pedestrian safety. While several of these locations undertook similar practices, the particulars of those approaches were tailored to fit each location. Second, in each of the locations, high-level policy guidance played an important role in setting the trajectory of departmental or agency actions. Third, in each of the locations, design guidance also played a critical role. Those involved in the day-to-day planning and design of the pedestrian realm required up-to-date, specific guidance on acceptable practices.

Throughout the practices described in these four case studies, several challenges emerge as recurring themes. Navigating the requirements and priorities of agencies that share jurisdictional authority is a common difficulty. Often municipalities are reliant on county, state, or federal programs and agencies; misalignment of values among the various agencies can jeopardize pedestrian-related projects. Additionally, changing the culture of an organization, or institutionalizing new philosophies, is a common difficulty.

Similarly, these case studies demonstrate several recurring themes in terms of successful principles that can be applied to different practices. Many of the practices were successful because of early and meaningful collaboration with partnering agencies and other stakeholders. These case studies also underscore the need for pragmatic approaches—in many cases, success was enabled by the ability of the professionals involved to form a realistic assessment of the institutional, political, or financial framework at play and adapt an approach that fit within that framework.

Challenges to Implementation

Jurisdictional Issues

Municipalities are the central players in the design, construction, maintenance, operation, and retrofitting of pedestrian environments. Yet, as evidenced in the case studies, local communities are heavily reliant on funding from various levels of government and are frequently bound to the standards or requirements of those bodies. Similarly, municipali-ties frequently have county and state properties within their borders for which they lack jurisdiction.

Internal Adoption

For several of the practices included in these case studies, internal adoption or institutionalization of new practices was difficult. This challenge was often due to existing agency culture or to staff being acculturated to working a certain way. In Minneapolis, the philosophy and approach of the Design Guidelines for Street and Sidewalks was successfully incorporated into the city framework by requiring that the guidelines be reflected in the Project Overview and Rationale document. This forced planners, designers, and engineers to begin projects using the guidelines' approach. In New York, adoption of a similar requirement for the inclusion of a new project cover sheet that describes the project's adherence to the Street Design Manual has been a useful tool for institutionalizing the policy shift.

Keys to Success

Policy Guidance and Support from the Top

In all four case study communities, broad high-level policy documents served two important roles: (1) they provided direction for improving the pedestrian environment, and (2) they served to clearly express to city staff and community residents a new philosophy—one that places pedestrians on equal footing with other modes. These policies all featured implicit, and in some cases explicit, reinforcement of highest level political support. They offer clear directives from elected officials.

New York City's PlaNYC 2030 required a change in the way the public and city agencies think about and interact with the city. New York City DOT and other city agencies were given clear directives to take bold steps in reimagining the built environment. PlaNYC 2030 also sent the message that agency staff would have the highest level of support necessary to undertake these tasks.

Charlotte's Transportation Action Plan set out definitive policy guidance that spelled out Charlotte's urban vision and declared the need for increased multimodalism. With the support of the general public and formal adoption by the City Council, city departments had clear instructions to increase the safety and comfort of the walking environment.

Access Minneapolis tied various transportation initiatives together under a common vision of increasing multimodal opportunities and strengthening the role of pedestrians and bicyclists throughout the city. What could have been six discrete initiatives was instead packaged as one common program that built on the successes of each piece and used momentum to carry significant positive change for pedestrians in Minneapolis.

Olympia's Transportation TMS formalized the will of the community to make walking more attractive and safe. By working through policy recommendations, the TMS provided city staff with clear direction on strategies to pursue.

Design Guidance Is Essential

All four communities created new design guidelines or standards to fill the void for projects that would incorporate pedestrians in innovative and meaningful ways. However, each of these design guidelines is uniquely oriented toward the specific environment in which it was created and demonstrates the flexibility of these documents.

The New York City *Street Design Manual* is a voluntary design manual that provides guidance on the full spectrum of tools that designers and engineers have at their disposal in New York City, including innovative ideas that previously lacked such guidance.

In Charlotte, the *Urban Street Design Guidelines* was created not just to implement new standards that better accommodate all modes (including pedestrians) but also to provide a new implementation approach to street design that incorporates the Complete Streets philosophy and requires the consideration of pedestrians in the design of all projects.

In Minneapolis, the Design Guidelines for Streets and Sidewalks was developed to help city staff and city residents implement the Complete Streets philosophy and was made enforceable by proxy through the Citywide Action Plan,.

Olympia's street standards were revised to better incorporate pedestrians, and then were used as a tool for leveraging available impact fee funding.

Each of these design guidelines serves a slightly different function, but all demonstrate the importance of providing clear guidance on what is acceptable and desired in a given community.

Collaboration

The creation of safe and inviting pedestrian environments relies on the interplay among several factors that necessarily involve multiple disciplines and practices. It is not surprising that an oft-cited key to success for the practices described above was collaboration with other relevant agencies. However, those interviewed described this collaboration as going above and beyond traditional consultation. In three of the case studies—New York *City's Active Design Guidelines and Street Design Manual*, Charlotte's *Urban Street Design*

Guidelines, and every component of Access Minneapolis—the lead agency brought partnering agencies on board from the inception of the project and incorporated their input and expertise in real and meaningful ways throughout the development of the product and well into implementation.

Pragmatism, or Practical Approaches

Throughout these case studies, success has largely been driven by the ability of those involved in development and implementation to make accurate and clear assessments of the institutional, political, and/or financial framework at play and adapt a practical approach that fits within that framework. In Olympia, for instance, state law prevents the city from using impact fees for stand-alone pedestrian projects. As a practical response, the city adapted its Street Design Standards to require full consideration and accommodation of pedestrians in *every* project so that it could leverage those impact fee dollars to include pedestrian planning in everything.

This approach is seen throughout the case studies. The New York City Plaza Program, which at its heart is a drastic reimaging of street space, has taken an approach that requires both expressed support by the local community and an organization that will take responsibility for the proposed plaza's operations and maintenance. If those conditions are not met, the New York City DOT will spend its limited resources elsewhere. In Minneapolis, the Downtown Action Plan began with the specific target of untangling congestion for buses on two central thoroughfares. After evaluating ways to accomplish that goal, the participating agencies built a practical action plan that hinged on emphasizing transit and pedestrians in sensible locations and enabling connections where demand existed. The partnering agencies also recognized that design guidelines would be necessary to plan the significant changes they were proposing.

Conclusion

The four case study locations demonstrate the universal challenges facing transportation professionals who are trying to improve the pedestrian environment and common themes in the ways that communities have sought to address these challenges. From New York with more than eight million residents to Olympia with 50,000 residents, radical changes to improve pedestrian safety and the overall walking environment rely on clear policy direction and proper design guidance, and are often enhanced by meaningful collaboration and cooperation with other relevant agencies or stakeholders, and an overall pragmatic approach that utilizes creative adaptation to formulate successful implementation strategies.

CHAPTER FOUR

SUMMARY OF IMPLEMENTATION CHALLENGES AND STRATEGIES

This chapter explores the recurring themes and issues uncovered in conducting this research. It draws from available literature and refers specifically to the practices discussed in chapters two and three. It explores critical barriers to the implementation of successful practices and potential strategies for addressing those barriers.

Recognizing that various practices may have greater success or applicability under various contextual settings, this chapter includes a discussion of how different practices have been used in various developmental settings, including new and infill development as well as street reconstruction and retrofitting. It also discusses variation of practices based on place type, and how large and small communities adapt these practices to match their differing needs.

CHALLENGES

The challenges and barriers to implementation of practices that support safe pedestrian environments are many and diverse. A substantial portion of the transportation professionals interviewed for this research consistently raised several issues. For the purposes of this discussion, those issues are grouped here into three broad categories: (1) external challenges, (2) internal challenges, and (3) logistical or practical challenges.

External Challenges

The success of many of the practices included in this report is predicated on buy-in or acceptance of the practice from multiple players, especially the general public and elected officials. Elected officials typically have the ability to apply pressure on municipal staff to change practices they do not support. The general public can to do the same by applying pressure on elected officials. It is therefore important to that these practices garner public support.

Often opposition from the general public is not seen on the policy level but rather in response to specific projects. This can occasionally occur because of the public's lack of understanding regarding the physical manifestation of a safety policy or because many members of the public do not pay close attention to municipal planning processes until a project is proposed at their doorstep. Chapters two and three discuss a number of strategies employed by implementing agencies. Most of these strategies focus on some form of community outreach. In the cases of Boston's Complete Streets Guidelines and Burlington's Traffic Calming and Neighborhood Enhancement Program, the practice requires the expressed support of the community or the strategy will not be employed. In both cases, the implementing agency found that a community champion could be invaluable in building support among neighbors.

Opposition from developers was a commonly cited challenge. In Miami, where developers and real estate attorneys mounted opposition to the implementation of Miami 21, the Planning Department formed strategic partnerships with neighborhoods groups and homeowners' associations. When Salisbury, North Carolina, began requiring sidewalks for all development, developer opposition threatened to derail the initiative. By compromising with the implementation of an In Lieu Fee program that allows for discounts, the city was able to get the necessary buy-in from developers, and the practice has been a success.

Interjurisdictional and partnering entities also present external challenges. The complex nature of the pedestrian environment often necessitates cooperation and collaboration among agencies of various functions. Additionally, local communities are often heavily reliant on funding and bound to the standards of other levels of government. Barriers arise when the necessary bodies do not all share the same vision for the pedestrian environment or the role of walking in the transportation system. Several approaches have demonstrated success. In Boston, the strong support of the mayor brought the partnering agencies to the table to assist in developing the Complete Streets Guidelines. Minneapolis is actively engaged in discussion with the state in pursuit of greater flexibility in state-applied roadway standards.

Partnering agencies may lack precedent for active collaboration in the necessary ways. Again, political support has been key in urging agencies to cooperate. In Los Angeles, various agencies were brought together by a mutual understanding that each participating agency would "get something" out of the process in developing the Downtown Design Guide. This proved a successful approach.

Internal Opposition

Many of the practices included in this report represent significant policy shifts for the lead agency or community or are simply innovative methods. In the broader field, many planners and engineers were trained in an era when automobile-oriented policies were dominant, and many agencies have been guided by automobile-oriented policies for decades. Accommodation of multimodal approaches requires not only new skills, but also the ability to approach the profession with a new worldview. Implementing these practices requires adaptive staff. Internal adoption, or institutionalization of new practices, was described as a common challenge. Often, this challenge was due to staff being acculturated to working a certain way. As seen in Ann Arbor, strong political and agency leadership helped to bring staff on board. Internal adoption was further supported there when staff saw that the new methods were successful.

Other agencies, including New York City DOT with its *Street Design Manual*, Minneapolis Department of Public Works with its *Design Guidelines for Streets and Sidewalks*, and San Diego's SANDAG with its revision of TransNet pedestrian project evaluation criteria have implemented procedural processes that require staff to demonstrate that they have consulted and or adhered to the new practice. This requirement assisted in institutionalizing the new practice. Institutionalization of pedestrian-friendly practices was also seen in locations where overwhelming support from the top helped to change the culture of the agency, as seen in Boston's Transportation Department and in Ann Arbor.

Logistical Difficulties

A number of recurring challenges are not unique to pedestrian safety practices but are representative of general logistic or practical issues. For instance, in several cases, high-level participation among partnering agencies was cited as a key to success. However, in many of these cases, it was also noted that high-level participation made scheduling meetings exceedingly difficult and in some cases slowed the development of the practice.

The fact that many of the practices described here are innovative posed a challenge, in that there was no road map for success. Many of those who undertook these initiatives had to chart the path forward and navigate new or previously unexplored bureaucracies and procedures. New York City DOT's Plaza Program has forged a slow and deliberate process that is ultimately successful but required considerable thought about procedures at every step of implementation.

Robust data on pedestrians, pedestrian behavior, the pedestrian environment, and pedestrian crashes are inconsistently collected and maintained, and that has posed a challenge for pedestrian safety practices. In downtown Los Angeles, prior to the development of the Downtown Design Guide, the city lacked comprehensive data on the city's right-of-way. Without that information, the guide would have been of little value, so the consultant recruited university students and collected the data.

Local police departments most commonly record pedestrian crash data. There is great variation in the quality and consistency of those data. State DOTs often serve as warehouses for the pedestrian crash data, but again, there is wide variation in how the data are kept and made available. The Chicago DOT has taken an active approach to collaborating with the Chicago Police Department and the Illinois Department of Transportation to improve the quality and consistency of pedestrian crash data. For New York City's Pedestrian Safety Study, the DOT stitched together a patchwork of data sources to fill gaps in what was available from state and local sources. Similarly, there is a general lack of tracking of performance measures prior to and following pedestrian improvements. The examples of New York City and Chicago as well as Los Angeles, Hoboken, and others underscore the tremendous value of good data and demonstrate how quality information can be used to establish effective policies and practices.

KEYS TO SUCCESS

Many of the keys to success that professionals have cited involved in the implementation of these practices are, in fact, the solutions to the challenges described above. Common elements included high-level support or guidance from politicians or agency leaders, and from the general public. This support and guidance takes many forms, discussed below. Another class of successful elements can be described as an overall pragmatic or practical approach. Designing and planning safe pedestrian environments is frequently a small subset of activities undertaken by an agency or a small part of what several agencies do collectively. Combined with the fact that many of these pedestrian safety practices are relatively new and represent a shift in policy, the development of these practices often benefits from a practical assessment of and adaptation to the existing framework or context. This approach manifests itself in creative funding schemes, unique collaborations, and other examples of professionals devising solutions within their parameters.

Support from the Top and Policy Guidance

Often, the practices included in this report were enabled by significant support of high-ranking leadership. In several cases, this support came from the mayor or a council member. In other cases, it came from agency leaders. In many cases, the development of these practices was directed by broad policy guidance endorsed by these political and civil leaders.

As discussed in chapter three, policy guidance can play a significant role in the development of pedestrian safety-oriented practices. In New York City, PlaNYC 2030 provided the impetus for several of the significant successes described there. The Transportation Action Plan and Access Minneapolis served similar roles in Charlotte and Minneapolis, as did Olympia's Transportation Mobility Strategy.

Support from political leadership can also come in the form of explicit expressed endorsement of pedestrian-friendly practices. Boston's Mayor Thomas Menino publicly adopted Complete Streets principles as one of his signature issues. This support has been instrumental in enabling interagency cooperation and facilitating the pedestrian-oriented practices in that city. Similarly, Miami 21, which required significant cooperation and collaboration among city agencies, was facilitated by the strong support of then Mayor Manny Diaz. The mayor had made the initiative a key agenda item and helped push the process forward.

In other cases, bold agency leadership played a vital role. This can be seen in New York City, where the DOT commissioner, in service to the mayor and under the direction of PlaNYC 2030, has directed a significant shift in policy that has given much greater emphasis to pedestrians. This is also evident in Ann Arbor, which created a new transportation program manager position with the sole responsibility of overseeing nonmotorized transportation activities. In Hoboken, the Transportation and Parking director has undertaken several pedestrian-oriented programs and activities that have demonstrated great creativity and innovation.

Community Support

Community support can play an important role in the success of practices that support the creation of safe pedestrian environments. In several of the communities included in this report, the "spirit of the community" was cited as not just a key to success but also a driving force behind these practices. In Ann Arbor, the community places great value on walkability and demands that the government provide transportation options. In Olympia, the measure for funding sidewalks and parks was a bottom-up, grassroots community-driven initiative.

In communities where residents are not overwhelmingly in favor of these practices, several professionals cited community champions as the key to implementation. In Boston, where the implementation of the Complete Streets Guidelines requires the support of the local community, the Transportation Department has found that residents might be skeptical or distrustful when the department explains the benefits of the Complete Streets approach, but when the same arguments are made by a fellow community member, they are more persuasive.

Burlington built its Traffic Calming and Neighborhood Enhancement Program around the concept of community-driven sponsorship. A community champion, who in turn takes responsibility for gaining or establishing the support of their neighbors, must spearhead requests for improvements through this program. This approach is also seen in Charlotte's Sidewalk Retrofit Policy and New York City's Plaza Program.

Pragmatism and Practical Approaches

The success of the practices included in this report has largely been driven by the ability of those involved in the development and implementation of the practices to make accurate and clear assessment of the institutional, political, or financial framework at play and adopt a practical approach that fits within that framework.

In a variety of practices, getting the right players around the table was noted as a significant element of success. Often, this meant forging new relationships, new avenues of communication, and new kinds of collaboration between agencies. For right-of-way engineering and geometric design guidelines and architectural and urban design guidelines, collaboration between various agencies with expertise in different fields was described as critical for almost every practice. That collaboration was enabled through the persuasion of political or agency leaders, or in some cases because the leaders at relevant partnering agencies shared philosophies and the desire to collaborate. In Los Angeles, collaboration on the Downtown Urban Design Guide was partially encouraged by creating the right incentives. Each of the participating agencies knew that it was going to receive a useful product out of the process.

Often, agency collaboration benefited from high-level participation. The development of practices such as New York City's *Active Design Guidelines and Street Design Manual* represented significant changes in thinking for the agencies involved, and high-level participation indicated to agency staff that these shifts had the full backing of agency leadership. However, also in New York City, the collaboration between the Police Department and DOT was deemed most appropriate at the operations level, as it makes the collaboration more nimble, easier to coordinate, and more direct (i.e., the individuals at each agency with firsthand knowledge are able to converse).

In several instances, product testing and refinement through the implementation of draft guidelines was cited as a strength of the overall implementation process. In Boston, the Transportation Department's adoption of the Complete Streets Guidelines helped the agency refine the guidelines but also helped to introduce Complete Streets concepts to contractors and other stakeholders. Similarly, implementation of draft elements of Los Angeles's Downtown Design Guide was cited as essential to creating a

strong, workable document that had buy-in from necessary agencies and stakeholders.

For several practices, notably the Clifton Corridor Urban Design Guidelines and Miami 21, the selection of a consultant played a vital role. The Clifton Corridor consultant, who was not from the area, was able to negotiate difficult stakeholder relationships where a local player might not have had the same success. For Miami 21, the lead consultant brought "star power" and fostered media and public attention that helped the process move forward with increased energy.

These pragmatic and practical approaches can be seen throughout the practices in this report: in Olympia's creative use of impact fee funding for pedestrian projects, in Chicago's approach to improving pedestrian crash data, and in New York City DOT's experimentation with new Master Concession Agreements for its NYC Plaza Program. The success of these pedestrian safety-related practices hinges on the ability of those involved to adapt to their given framework.

CONTEXTUAL VARIATION

Virtually all of the practices discussed in this report required adaptation and pragmatic structuring to meet the needs of the local context. Many of these practices have application in varying contexts, but the particular details and aspects of the practices must be adjusted to suit the setting. Exploring these practices in terms of particular development contexts sheds light on the specific approaches that have been successful in these settings.

New Development

For the purposes of this report, new development is defined as any greenfield development that includes new roads, infrastructure, or transportation facilities. The term also applies to significant redevelopment projects that might benefit from a "clean slate" environment. Communities have perhaps the greatest ability to create safe pedestrian environments by adopting policies and practices that support these environments *before* land is developed. Both population density and density of land uses are correlated to increased pedestrian activity, and pedestrian safety practices targeted for new development often do well to focus on those aspects.

Land development regulation is the most powerful tool regarding new development. Several communities, including Charlotte and Olympia, have demonstrated the significant challenge of trying to improve the pedestrian environment in sparse, poorly connected environments. In both communities, which are representative of a great many communities across the country, significant efforts have resulted in modest gains. Land development and land use regulation upfront can help communities avoid costly and difficult solutions in the future.

Boise illustrates how a community can include connectivity and pedestrian accommodation requirements in its subdivision and/or zoning requirements, thus ensuring a well-connected built form that enables pedestrian access.

Infill Development

"Infill development" in this report refers to development or street construction projects that are undertaken in built-up contexts wherein the new project is bound by existing infrastructure or development. Infill development offers a community several opportunities for improving the pedestrian realm. By increasing density, infill developments can naturally improve the convenience and accessibility of walking. Greater densities also enable pedestrian-supportive services such as transit. Additionally, as seen in this report, communities can implement practices that further capitalize on that development and induce specific pedestrian improvements.

Arlington, Virginia's form-based code for Columbia Pike has incentivized infill development, resulting in the construction of more than 1,000 new housing units and office and retail development, all while requiring various pedestrian-supportive elements. However, this large-scale infill development effort has required considerable coordination, as property lines and right-of-way measurements vary on a lot-by-lot basis.

In the case of Salisbury, North Carolina, any infill development on a parcel that does not currently feature a sidewalk must include a sidewalk on that lot frontage or pay an In Lieu Fee that is deposited in the city's sidewalk fund. The city's pedestrian realm benefits on several fronts: It gains sidewalk segments that are then factored into the city's Sidewalk Priority Index when evaluating where to invest in sidewalks, or it gains funding for priority sidewalk projects, and it benefits from infill development, which can contribute to a more convenient walking environment.

During the implementation of Project 180, Oklahoma City, Oklahoma, found that construction contractors had little experience with infill development because the vast majority of development in the area occurs on the outer fringes of the city. Both street construction crews and building development contractors needed special training by the city to prepare them for safety and logistical practices such as closing sidewalks when construction is occurring above and traffic management plans.

Street Reconstruction

This report defines "street reconstruction" as reconstruction of existing streets on a scale that could or does include new designs or plans. Street reconstruction does not include street maintenance or resurfacing. Street reconstruction projects offer significant opportunity for communities to

update their modal priorities and elevate the role of pedestrians in street design. To accomplish this, several of the communities in this report produced innovative engineering and design manuals.

In both Minneapolis and Charlotte, new design manuals not only offer new designs but also entirely new approaches and processes for undertaking street design and construction. These communities have found great success in approaches that require designers and engineers to think broadly about the role of streets, as opposed to thinking primarily of vehicle throughput.

In Boston, the Complete Streets Guidelines demonstrate how new guidelines need not necessarily rely on formal adoption to foster successful change. The Boston Transportation Department began implementing elements of those guidelines as they were being developed to see on-the-ground results and fine-tune the developed product. As the implementing agency, the department had the authority to simply include language in its contracts that required the inclusion of pedestrian-friendly elements in street reconstruction projects. This experimentation not only resulted in a strong product, but also enabled the department to point to these successes as it pursued Complete Streets designs in communities that were unaccustomed to such designs.

Retrofit Practices

In this report, "retrofit practices" refers to policies or practices that aim to improve existing infrastructure while working within existing conditions. Retrofit practices can include the building new sidewalks on existing roads, restriping road surfaces to create narrower lanes and new bicycle facilities, and other projects. Some communities have used retrofit practices as temporary stopgaps to provide short-term relief while long-term permanent solutions are planned or until funding becomes available.

As much of the built environment in communities across the country was designed and built without pedestrians in mind, retrofit practices are essential for converting these environments into ones that can support and sustain safe pedestrian activity. Many of the practices in this report have retrofit applications, and several are specifically targeted for that purpose.

New York City's Plaza Program offers a model of the significant reimagining and repurposing of public streets that is possible. The program converts unsafe or underutilized spaces dominated by cars into public spaces actively used by people. The program also demonstrates that these immense retrofit changes can be accomplished for relatively little money. In this case, the retrofit can be a quick, temporary solution while more long-term permanent plans are developed and funding is secured.

Hoboken Daylighting offers another fine example of a retrofit that can be accomplished quickly and cheaply, while making safety gains and improving the comfort of pedestrians. By using inexpensive vertical delineators to keep the areas close to crosswalks clear, the city not only opens sightlines and improves safety but also makes a statement about the relative importance of pedestrian safety and the needs of parkers, and demonstrates how creative and pragmatic approaches can produce significant results.

Burlington, Vermont's Traffic Calming and Neighborhood Enhancement Program provides an example of a city's willingness and ability to listen to residents and adapt the built environment for the benefit of pedestrian safety. Through its community-driven approach, the city is able to learn from its citizens, provide education on potential solutions, and implement retrofit applications that suit the community's needs.

The Charlotte DOT's Sidewalk Retrofit Policy provides a framework for fairly and equitably filling gaps in the pedestrian network. By utilizing an objective prioritization scheme, the agency is able to defend its priorities and continue improving pedestrian safety. By providing an avenue for communities to request and support additional sidewalks, the city avoids spending its resources in locations where sidewalks are not wanted and are of low priority.

Place Types

The practices discussed in this report generally have applications in multiple settings. However, each must be tailored to match the specific implementation context. Communities of varying sizes face different needs and different challenges.

In large communities, additional challenges may be introduced through the logistical difficulties of large bureaucracies. For example, some of the challenges described above under logistical challenges, such as coordinating schedules between high-level agency staff, were particularly prevalent in large communities where agencies may have offices scattered throughout a city and include thousands of employees. In several of the smaller communities interviewed for this research, professionals described being able to walk down the hall and engage staff at in a partnering department.

Similarly, the needs of less dense communities differ. Whereas Hoboken is a relatively small city, its density prompts the need for Hoboken Daylighting. Such a practice may not have role in a larger but less dense community.

However, several types of practices were cited as having almost universal benefit. Pedestrian-friendly engineering and design guidelines were cited as having great value in every context. Similarly architectural and urban design guidelines were thought to be of high value in many settings.

CHAPTER FIVE

CONCLUSIONS

Many communities are encouraging pedestrian transportation to improve public health and safety, reduce the public costs of private automobile travel, improve personal mobility, and create other economic benefits. This synthesis documents practices that diverse communities have undertaken in a range of settings and contexts with the goal of improving the pedestrian environment, along with the challenges faced, and the keys to success for the communities that implemented these practices.

It is important to note that transportation planning is not conducted in a vacuum and that the needs of pedestrians must be considered in the broader context of a transportation system that has many goals and responsibilities. This synthesis does not address the complexities and tradeoffs of balancing the needs of pedestrians with other modes, including automobiles, transit, freight, and bicycles.

The practices in this report were each developed to match specific institutional, legal, and environmental frameworks. And yet, several recurring and themes relating to the effectiveness of practices have emerged.

Architectural and urban design guidelines were reported as effective in several communities where they were adopted as mandatory requirements and when the lead agency policy requires the incorporation of the guidelines into its designs or contracting language.

Right-of-way engineering and geometric design guidelines were also reported as effective when compulsory. However, these guidelines are often subject to scrutiny and discretionary authority of agencies at the county, state, and federal levels. Collaboration and negotiation with these higher levels of government was reported as necessary.

Planning and land development regulations were reported as effective in communities where the local community expressed substantial support. In several communities, this support was bottom up, while in others, the lead agency had to conduct considerable outreach to build support.

A wide range of financing mechanisms were reported as successful in funding pedestrian projects; many of the practices described in this report benefited from creative implementation of available mechanisms.

Operations, maintenance, and enforcement measures were reported as successful by communities that conducted ample community outreach and collaboration between relevant agencies, including engineering and police departments.

SUMMARY OF FINDINGS

Each of the practices documented in this report was tailored to suit the specific financial, political, institutional, and geographic context of its community. There is no one-size-fits-all panacea for the promotion of safe pedestrian environments. However, several recurring themes emerged from the information gathered for this synthesis.

Support from the Top

Support from high-ranking agency leaders and elected officials is often an important component of these practices. In examples throughout this report, the success of the practice was enabled by clear and prominent support from mayors, City Council members, and agency or department heads. This support provides staff with guidance on priorities and can induce crucial cooperation and collaboration among agencies and different levels of government, and can help overcome opposition from external sources.

Policy Guidance

Similarly, many of the practices in this report have benefited from high-level policy guidance. This guidance may take the form of comprehensive plans, action plans, or policy statements. This policy guidance provides departments and their staff with clear direction for policy shifts that favor practices that support the creation of safe pedestrian environments.

Agency Collaboration

The creation of safe pedestrian environments often occurs at the intersection of various fields. Many of the practices in this report benefited from cooperation and collaboration among agencies and departments including transportation, planning, public works, and parks and recreation departments, design studios, law enforcement, emergency response, and transit agencies.

Often the success of these practices also relied on the ability to cooperate with local, county, regional, state, and federal levels of government. Throughout the examples in this report, collaboration and cooperation among the city, county, and state was essential to producing workable and effective products.

Public Outreach

Similarly, outreach and collaboration with the general public demonstrated great benefit for many of the practices included here. Some of these practices are based on community-driven processes, and most require public support, for without that support, the practice cannot be sustained.

Pragmatism and Practical Approaches

Throughout the practices in this report, success has largely been driven by the ability of those involved in the development and implementation of the practices to make accurate and clear assessment of the institutional, political, or financial framework at play and adapt a practical approach that fits within that framework.

Barriers to Implementation

Philosophical and policy priority differences between partnering agencies presented a barrier to implementation for many of the practices included here. Municipalities are the central bodies involved in the implementation of safe pedestrian environments, but frequently they are dependent on funding and review from agencies at various administrative levels. Philosophical differences between these bodies can present a significant barrier. This type of barrier can also arise when the various agencies or departments that must collaborate at the same administrative level disagree.

Funding challenges also pose a significant barrier to the implementation of practices that support safe pedestrian environments. The agencies responsible for the implementation of these practices have utilized all types of funding mechanisms, including dedicated budgetary line items, grants, private funds, various forms of taxes, impact fees, and state and federal programs.

RECOMMENDATIONS FOR FURTHER RESEARCH

The examples in this report are intended to provide a broad range of settings and developmental contexts for pedestrian-supportive practices. However, in conducting this research, little information was found on practices employed in rural contexts (defined as communities with fewer than 5,000 residents and regions with fewer than 50,000 residents). Large cities and metropolitan areas dominate the literature on the topic of pedestrian safety. Future research should focus on strategies employed by rural communities to provide safe pedestrian environments.

Little information was found on the removal of snow and debris from sidewalks. Considering the importance of clean, clear, unobstructed, and safe pedestrian facilities, the nature and efficacy of these policies and practices could serve as a topic of further research. Similarly, sidewalk repair and maintenance policies and practices would provide interesting subject matter for further research.

There is great variation in the quantity and quality of pedestrian safety data. The kinds of information collected as well as the techniques for collecting, maintaining, and analyzing these data vary from community to community and state to state. Further research could focus on the practices of communities and states that have found successful methods for improving the quality and quantity of pedestrian safety data and analysis. Potential practices for further exploration could include the Chicago Department of Transportation's training of police officers, and New Jersey's Plan4Safety GIS analysis tool that allows for geospatial analysis of all crashes in the state.

GLOSSARY

Bulb-out—A curb extension used as a traffic-calming measure, which also provides improved visibility and shorter crossing distances for pedestrians.

Complete Streets—Roadways designed and operated to ensure comfortable access and travel for all users, including motorists, transit, bicyclists, and pedestrians. Official policies that encourage or require these accommodations are known as Complete Streets Policies.

Context Sensitive Solutions—A collaborative approach to planning that involves stakeholders in determining that a transportation facility fits within its setting while also improving or maintaining safety, mobility, and infrastructure conditions.

Daylighting—Removing parking spaces adjacent to curbs around an intersection to increase visibility for pedestrians and motorists.

Fenestration—The placement of windows and building openings.

Form Based Codes—A means of regulating development to achieve specified urban forms. They create a predictable public realm by controlling the physical form of buildings and land use to a lesser extent. The pedestrian environment is primarily addressed through the relationship between buildings and the scale and types of streets and blocks they occupy.

Infill development—The use of land within a built-up area for further construction.

New Urbanism—A movement that promotes livable streets arranged in compact, walkable blocks; a range of housing choices to serve people of diverse incomes and ages; schools, stores, and other frequent destinations reachable by walking, cycling, or transit; and an emphasis on a human-scaled public realm where appropriately designed buildings enliven streets and other public spaces.

Pedestrian-scaled lighting—Improvements to walkway illumination by lighting sidewalks rather than streets.

Shared Streets—Common spaces to be used by pedestrians, bicyclists, and low-speed motor vehicles.

Smart Growth—An urban planning theory that concentrates growth in compact, urban areas to counteract sprawl and promote transit and walkability.

Tax Increment Financing—A method to use future gains in taxes to finance current improvements.

Traffic calming—Measures to slow or reduce motor-vehicle traffic to improve safety and mobility for pedestrians and bicyclists.

Transportation Impact Fee—A method of reimbursing local government for the costs incurred by new development.

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APPENDIX A

Policies and Practices

Data Source Information:

Population

2010 Census data: DP-1, Profile of General Population and Housing Characteristics: 2010; 2010 Demographic Profile Data

Note: Big Lake, MN data are based on American Community Survey Demographic and Housing Estimates: 2005–2009; Data Set: 2005–2009 American Community Survey 5-Year Estimates; Survey: American Community Survey

Population Density

2000 Census Data: GCT-PH1. Population, Housing Units, Area, and Density: 2000; Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

Age

2000 Census Data: QT-P1. Age Groups and Sex: 2000; Census 2000 Summary File 1 (SF 1) 100-Percent Data

Median Income

2005–2009 American Community Survey Data: Median Household Income in 2005–2009 American Community Survey 5-Year Estimates; Survey: American Community Survey; Table: B19013 MEDIAN HOUSEHOLD INCOME IN THE PAST 12 MONTHS (IN 2009 INFLATION-ADJUSTED DOLLARS); Universe: Households

Poverty Rate

2005–2009 American Community Survey Data: Reflects PERCENTAGE OF ALL PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL: Selected Economic Characteristics: 2005–2009; Data Set: 2005–2009 American Community Survey 5-Year Estimates; Survey: American Community Survey

Note: Poverty rate reflects the percentage of all people whose income was below the poverty level in the last 12 months.

Diversity

2010 Census Data: DP-1 Profile of General Population and Housing Characteristics: 2010; 2010 Demographic Profile Data

Note: Big Lake, MN data are based on American Community Survey Demographic and Housing Estimates: 2005–2009; Data Set: 2005–2009 American Community Survey 5-Year Estimates; Survey: American Community Survey

Note: Data reflect responses from those that identify as the listed race alone.

Engineering and Design Guidelines

Berkeley, CA—Pedestrian Master Plan		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline	✓	New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
The Berkeley Pedestrian Master Plan provides an analysis-rich approach to pedestrian planning. It ranks 100 high-priority intersections in need of pedestrian treatments "based on safety, usage, and access to major destinations, and recommends improvements. The Plan also recommends changes to the city's zoning and design review, provides design standards, and calls for increased law enforcement. Public education campaigns will also help remind drivers, cyclists and pedestrians of how to share the streets safely. The final draft of Berkeley's first Pedestrian Master Plan was completed based on comments received from City Council, Commissions and the public" (City of Berkeley 2011).			
For more information on the Pedestrian Master Plan, visit http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=16124			
Population		Population Density	
112,580		9,823.3 people per square mile	
Diversity		Age	
White	59.5%	Under 18 years	14.1%
Black or African American	10.0%	18–64 years	75.7%
American Indian & Native Alaskan	0.4%	65 years and over	10.2%
Asian	19.3%	Income	
Native Hawaiian & Other Pacific Islander	0.2%	Median Income	$59,097
Some Other Race	4.4%	Poverty Rate	18.5%

Boston, MA—Complete Streets Guidelines		AASHTO Region: 1	
Category		Development Applications	
Engineering and Design Guideline	✓	New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
The city of Boston has undertaken new street design guidelines that incorporate the Complete Streets philosophy. "The new Complete Streets approach puts pedestrians, bicyclists and transit users on equal footing with motor-vehicle drivers. The initiative aims to improve the quality of life in Boston by creating streets that are both great public spaces and sustainable transportation networks. It embraces innovation to address climate change and promote healthy living. The objective is to ensure Boston's streets are multimodal, green, and smart. Led by the Boston Transportation Department, key city agencies have been meeting with some of the country's most innovative practitioners in an unprecedented collaboration to develop new street design guidelines and implement projects informed with the new Complete Streets approach" (City of Boston 2011).			
For more information on the Complete Streets Guidelines, see the Implementation narrative in chapter two, or visit http://www.bostoncompletestreets.org/.			
Population		Population Density	
617,594		12,165.8 people per square mile	
Diversity		Age	
White	53.9%	Under 18 years	19.8%
Black or African American	24.4%	18–64 years	69.8%
American Indian & Native Alaskan	0.4%	65 years and over	10.4%
Asian	8.9%	Income	
Native Hawaiian & Other Pacific Islander	0.0	Median Income	$52,433
Some Other Race	8.4%	Poverty Rate	19.1%

Charlotte, NC—Urban Street Design Guidelines		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline	✓	New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
The Charlotte Urban Street Design Guidelines provide a comprehensive approach to street design. The document includes design guidelines (text and diagrams) for streets and intersections, a thorough treatment of the evaluation of street space, and an approach for applying the guidelines. The Urban Street Design Guidelines utilize a Complete Streets philosophy that seeks to accommodate all road users in a context sensitive framework. The guidelines also incorporate the use of multimodal and pedestrian and bicycle level of service analyses for signalized intersections. The city began implementing the guidelines on its capital projects in 2004 on a best practices basis and the guidelines were formally adopted by the city council in 2007.			
For more information on the Urban Street Design Guidelines, see the Charlotte case study in chapter three, or visit http://www.charmeck.org/city/charlotte/Transportation/PlansProjects/Pages/Urban%20Street%20Design%20Guidelines.aspx.			
Population		Population Density	
731,424		2,232.4 people per square mile	
Diversity		Age	
White	50.0%	Under 18 years	24.7%
Black or African American	35.0%	18–64 years	66.5%
American Indian & Native Alaskan	0.5%	65 years and over	8.8%
Asian	5.0%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$52,364
Some Other Race	6.8%	Poverty Rate	12.8%

Minneapolis, MN—*Design Guidelines for Streets and Sidewalks*		AASHTO Region: 3	
Category		Development Applications	
Engineering and Design Guideline	✓	New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
The *Minneapolis Design Guidelines for Streets and Sidewalks*, "were developed to assist staff and stakeholders in the decision making process for planning and designing complete streets that support and encourage walking, bicycling and transit use while promoting safe operations for all users" (City of Minneapolis 2011).			
The guidelines include a new framework for urban street design and a new design process that stresses multimodalism, identification of place and street typologies, and public input.			
For more information on the *Design Guidelines for Streets and Sidewalks*, see the Minneapolis case study in chapter three, or visit http://www.ci.minneapolis.mn.us/public-works/trans-plan/DesignGuidelines.asp.			
Population		Population Density	
382,578		6,970.3 people per square mile	
Diversity		Age	
White	63.8%	Under 18 years	22.0%
Black or African American	18.6%	18–64 years	68.9%
American Indian & Native Alaskan	2.0%	65 years and over	9.1%
Asian	5.6%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$45,625
Some Other Race	5.6%	Poverty Rate	21.5%

New York, NY—*Street Design Manual*		AASHTO Region: 1	
Category		Development Applications	
Engineering and Design Guideline	✓	New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

"The New York City Street Design Manual provides policies and design guidelines to city agencies, design professionals, private developers and community groups for the improvement of streets and sidewalks throughout the five boroughs. It is intended to serve as a comprehensive resource for promoting higher quality street designs and more efficient project implementation….

The Manual builds on the experience of innovation in street design, materials and lighting that has developed around the world, emphasizing a balanced approach that gives equal weight to transportation, community and environmental goals. It is designed to be a flexible document what will change and grow, incorporating new treatments as appropriate after testing. The use and continued development of the Street Design Manual will assure that New York City remains a leading innovator in the public realm as it becomes a greater, greener city" (New York City Department of Transportation 2011).

For more information on the *Street Design Manual*, see the New York City case study in chapter three, or visit http://www.nyc.gov/html/dot/html/about/streetdesignmanual.shtml.

Population		Population Density	
8,175,133		26,402.9 people per square mile	
Diversity		Age	
White	44.0%	Under 18 years	24.2%
Black or African American	25.5%	18–64 years	64.1%
American Indian & Native Alaskan	0.7%	65 years and over	11.7%
Asian	12.7%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$50,173
Some Other Race	13.0%	Poverty Rate	18.6%

Portland, OR—Creating Livable Streets: Street Design Manual Guidelines for 2040		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline	✓	New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

Portland's Metro regional government offers a model livable streets design manual. First Published in 1997 and updated in 2002, "the handbook describes how communities can design streets to be people friendly and includes detailed illustrations of designs that integrate streets with nearby land uses…Specific design considerations addressed in the handbook, include:

• how streets can be retrofitted and upgraded with pedestrian-oriented amenities to promote walking, bicycling and the use of transit
• how to ensure that pedestrian improvements do not preclude reasonable truck and bus movement at major intersections and that truck and bus improvements do not inhibit pedestrian movement
• how streets should integrate bikeways
• how site access along regional arterials with continuous commercial or mixed-use development can be controlled to improve safety, function and appearance
• how to make tradeoffs between regional street design elements where right-of-way constraints limit desired design elements" (Oregon Metro 2011).

For more information on Creating Livable Streets, visit http://www.oregonmetro.gov/index.cfm/go/by.web/id=26334.

Population		Population Density	
583,776		3,939.2 people per square mile	
Diversity		Age	
White	76.1%	Under 18 years	21.1%
Black or African American	6.3%	18–64 years	67.4%
American Indian & Native Alaskan	1.0%	65 years and over	11.6%
Asian	7.1%	Income	
Native Hawaiian & Other Pacific Islander	0.5%	Median Income	$48,053
Some Other Race	4.2%	Poverty Rate	16.1%

St. Petersburg, FL—CityTrails Master Plan		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline	✓	New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

This Non-motorized Master Plan is guided by the vision that "St. Petersburg will be a city with a balanced transportation system designed to move people safely and effectively. Pedestrian and bicycle facilities shall be designed, encouraged and celebrated as indicators of a healthy city" (City of St. Petersburg 2003). The plan includes goals relating to improving pedestrian safety and increasing level of walking. In the late 1990s and early 2000s, the city ranked among the highest in pedestrian injuries and fatalities per capita in the nation. Due in part to the provisions of the CityTrails Master Plan, the city has undergone a significant turnaround and has been recognized by *Prevention Magazine* as one of the best walking cities in Florida.

For more information on the CityTrails Master Plan, visit http://www.stpete.org/bicycle/.

Population		Population Density	
244,769		4,163.1 people per square mile	
Diversity		Age	
White	68.7%	Under 18 years	21.5%
Black or African American	23.9%	18–64 years	61.1%
American Indian & Native Alaskan	0.3%	65 years and over	17.4%
Asian	3.2%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$43,103
Some Other Race	1.4%	Poverty Rate	13.6%

Santa Barbara, CA—Pedestrian Master Plan		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline	✓	New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

Santa Barbara's Pedestrian Master Plan intends to take "Santa Barbara's pedestrian system to the next level: to develop a comprehensive pedestrian system that enhances and increases the city's walkability to the extent that all people will feel safe walking, to increase connections to destinations throughout the city, to enhance the Paseo network [an interconnected network of pedestrian-oriented retail shopping streets], and to increase the number of children who walk and bike to school. Additionally, a major goal of the enhanced pedestrian system is to increase the overall health of Santa Barbara's residents by promoting walking as a viable means of transportation" (City of Santa Barbara 2006).

The plan includes a Pedestrian Design Guide that offers standards and guidelines for all aspects of the pedestrian realm with particular emphasis on accessibility.

For more information on the Pedestrian Master Plan, visit http://www.santabarbaraca.gov/Government/Departments/PW/Pedestrian_Master_Plan_ Table_of_Contents.htm.

Population		Population Density	
88,410		4,865.3 people per square mile	
Diversity		Age	
White	75.1%	Under 18 years	19.8%
Black or African American	1.6%	18–64 years	66.4%
American Indian & Native Alaskan	1.0%	65 years and over	13.8%
Asian	3.5%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$60,264
Some Other Race	14.7%	Poverty Rate	13.7%

Architectural and Urban Design Guidelines

Amarillo, TX—Downtown Amarillo Urban Design Standards		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline	✓	Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
In August 2010, the Amarillo City Commission adopted the Downtown Amarillo Urban Design Standards as a new part of the zoning code for projects in Amarillo's downtown area. The standards were a key component of a large scale effort to revitalize Amarillo's once-vibrant downtown. The standards direct development in the area according to six principles, which include the promotion of a pedestrian-oriented urban form, maximization of connectivity and access, and support of downtown businesses. Many features of the standards aim to strengthen the aesthetics and function of the pedestrian environment, reinforcing the community goal of creating a walkable downtown.			
While downtown revitalization was overwhelmingly popular in Amarillo, arriving at a consensus on mandatory design standards for the area was not easy; land use regulations in Amarillo have historically focused heavily on property owner rights. Despite some challenges, the standards are now being implemented, and recent adherent projects suggest positive outcomes.			
For more information about the Downtown Amarillo Urban Design Standards, see the Implementation narrative in chapter two, or visit http://www.downtownamarillo.com/development.			
Population		Population Density	
190,695		1,932.1 people per square mile	
Diversity		Age	
White	77.0%	Under 18 years	27.9%
Black or African American	6.6%	18–64 years	59.5%
American Indian & Native Alaskan	0.8%	65 years and over	12.6%
Asian	3.2%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$48,570
Some Other Race	9.4%	Poverty Rate	16.4%

Austin, TX—Urban Design Guidelines		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline	✓	Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
In 2000, the city of Austin adopted Urban Design Guidelines to "coordinate and orchestrate the overall development of the city core so that projects help each other succeed and result in a better, livable downtown." The guidelines incorporate a vision that includes "creating interactive streets and sidewalks that balance the need of the pedestrian, the bicyclist and the automobile and where the public life of the community is acted out" (Austin City Connection 2011).			
For more information on the Urban Design Guidelines, visit http://www.ci.austin.tx.us/urbandesign/guidelines.htm.			
Population		Population Density	
790,390		2,610.4 people per square mile	
Diversity		Age	
White	68.3%	Under 18 years	22.5%
Black or African American	8.1%	18–64 years	70.8%
American Indian & Native Alaskan	0.9%	65 years and over	6.7%
Asian	6.3%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$50,236
Some Other Race	12.9%	Poverty Rate	17.5%

Big Lake, MN—Downtown Design Standards		AASHTO Region: 3	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline	✓	Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

In 2004, the city of Big Lake, Minnesota, adopted the Big Lake Downtown Framework Plan and Design Guidelines. This document established a vision for the development of the city's Central Business District (CBD), in line with the Big Lake Comprehensive Plan. The document included a set of Downtown Design Standards, which provide specific guidance for land use, architecture, and streetscape issues through a mix of guidelines and regulations. Guidelines apply to projects in the CBD "transitional" zone. Projects in the established CBD zone must adhere to both guidelines and regulations. In both the guideline and regulations categories, the Downtown Design Standards call for wide sidewalks, attractive streetscapes, and pedestrian-scaled street lighting. Street facing parking lots are strongly discouraged, and the standards insist that any such lots be well landscaped and broken up with planter islands. The standards also address connectivity, requiring that projects demonstrate convenient connections to the established nonmotorized transportation network.

For more information, visit http://www.biglakemn.org/index.asp?Type=B_BASIC&SEC={7288A35E-77E5-4D94-8BCB-2DAA5BA1A5C9}

Population		Population Density	
9,422		1,688.4 people per square mile	
Diversity		Age	
White	92.4%	Under 18 years	32.5%
Black or African American	1.2%	18–64 years	61.9%
American Indian & Native Alaskan	0.9%	65 years and over	5.6%
Asian	0.6%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$62,816
Some Other Race	0.0%	Poverty Rate	11.0%

DeKalb County, GA—Clifton Corridor Urban Design Guidelines		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline	✓	Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

The Clifton Corridor Urban Design Guidelines, undertaken by a community coalition led by Emory University, cover a range of public and private spaces, including properties owned by the university and others. The guidelines identify 10 districts within the corridor and, for each, describes development opportunities and provides design guidelines for both the public and private realms. The guidelines consistently emphasize the enhancement of the pedestrian environment through the prescription of more and wider sidewalks, raised and colored crosswalks, bulb-outs and other pedestrian-oriented infrastructure elements, traffic-calming measures, and a focus on building massing and orientation to bring the built environment closer to the street.

For more information on the Clifton Corridor Urban Design Guidelines, see the Implementation narrative in chapter two, or visit http://cliftoncommunitypartnership.org/learn/urban_design_guidelines.html.

Population		Population Density	
691,893		2,482.7 people per square mile	
Diversity		Age	
White	33.3%	Under 18 years	24.6%
Black or African American	54.3%	18–64 years	67.4%
American Indian & Native Alaskan	0.4%	65 years and over	8.0%
Asian	5.1%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$51,973
Some Other Race	4.5%	Poverty Rate	15.4%

Iowa—Statewide Urban Design and Specifications		AASHTO Region: 3	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline	✓	Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

The Iowa Statewide Urban Design and Specifications (SUDAS) establish a common set of standards for public improvements including sewers, water mains, streets, sidewalks, and signalization. The development of these statewide standards spanned many decades and involved extensive effort from more than 300 stakeholders across the state. The current SUDAS program is managed by the Institute for Transportation at Iowa State University, effectively facilitating a timely update process and ensuring that individual jurisdictions are informed of any changes. The SUDAS manuals are owned by the state through the Iowa SUDAS Corporation, a nonprofit entity established for this purpose.

The SUDAS Design Manual provides guidance on roadway design, and includes numerous elements aimed at enhancing the pedestrian safety throughout the state. The Design Manual highlights the benefits of access management techniques, such as reducing the number of driveways and providing greater distance between driveways. Raised pedestrian refuge medians, generous sidewalk setbacks, and measures to increase visibility for both drivers and pedestrians are also recommended. For more information about SUDAS, visit http://www.iowasudas.org/about.cfm. The SUDAS Design Manual is available online at http://www.iowasudas.org/design.cfm.

Population		Population Density	
3,046,355		52.4 people per square mile	
Diversity		Age	
White	91.3%	Under 18 years	25.1%
Black or African American	2.9%	18–64 years	60.0%
American Indian & Native Alaskan	0.4%	65 years and over	14.9%
Asian	1.7%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$48,052
Some Other Race	1.8%	Poverty Rate	11.4%

Los Angeles, CA—Downtown Design Guide		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline	✓	Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

In response to a period of rapid residential development in Los Angeles's downtown, the city adopted a Downtown Design Guide, that recognizes that "good choices must be made at all levels of planning and design—from land use and development decisions to building massing and materials choices—with an emphasis on Walkability and the making of great streets, districts and neighborhoods. The focus of the Design Guide is on the relationship of the buildings to the street, including sidewalk treatment, the character of the building as it adjoins the sidewalk and connections to transit. The successful treatment of these key features, coupled with particular attention to the details of a project in the first 30–40 vertical feet, form the basis for providing high quality development at a human scale" (Los Angeles Department of City Planning 2009).

For more information on the Downtown Design Guide, see the Implementation narrative in chapter two, or visit http://www.urbandesignla.com/downtown_guidelines.htm.

Population		Population Density	
3,792,621		7,876.8 people per square mile	
Diversity		Age	
White	49.8%	Under 18 years	26.6%
Black or African American	9.6%	18–64 years	63.5%
American Indian & Native Alaskan	0.7%	65 years and over	9.7%
Asian	11.3%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$48,570
Some Other Race	23.8%	Poverty Rate	19.1%

New York, NY—*Active Design Guidelines*		AASHTO Region: 1	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline	✓	Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
In New York City, the *Active Design Guidelines: Promoting Physical Activity and Health in Design* is an innovative and unique product that provides guidance on design strategies to promote pedestrian activity not only in the public realm but also inside public and private buildings. Most architectural guidelines that promote safe pedestrian environments focus primarily on the interaction of buildings with public streets and provide guidance on characteristics such as building massing or fenestration. While those elements are included here as well, the *Active Design Guidelines* also include guidance on the provision of stairs and their emphasis over elevators. The guidelines also provide design guidance on encouraging pedestrian circulation within buildings. For more information on the *Active Design Guidelines*, see the New York City case study in chapter three, or visit http://www.nyc.gov/html/ddc/html/design/active_design.shtml.			
Population		Population Density	
8,175,133		26,402.9 people per square mile	
Diversity		Age	
White	44.0%	Under 18 years	24.2%
Black or African American	25.5%	18–64 years	64.1%
American Indian & Native Alaskan	0.7%	65 years and over	11.7%
Asian	12.7%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$50,173
Some Other Race	13.0%	Poverty Rate	18.6%

Land Development Regulation

Amherst, NY—Amherst Traditional Neighborhood Zoning Project		AASHTO Region: 1	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation	✓	Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
The town of Amherst, New York, enacted a Traditional Neighborhood Business Zoning Overlay in May 2010, with the goal of encouraging mixed-use, pedestrian-oriented redevelopment in the town's older commercial areas. Redevelopment of these areas was a key recommendation in Amherst's Comprehensive Plan. The Zoning Overlay successfully rezoned two older commercial property areas, and the Town Board has identified three additional areas for potential extension of the overlay zone in the future. Prior to the enactment of this customized regulation, Amherst's older commercial areas fell under the "General Business" zoning category, along with the town's newer and larger auto-oriented commercial areas. This category did not appropriately incentivize or direct development in the older areas, and often led to projects that did not fit the areas' existing conditions or the community's goals for redevelopment. With the enactment of the Traditional Neighborhood Business Zoning Overlay, Amherst aims to facilitate context-sensitive development in alignment with the community's vision for commercial areas that are dense, diverse, and walkable. For more information about the Amherst Traditional Neighborhood Zoning Project, visit http://www.amherst.ny.us/govt/govt_dept.asp?dept_id=dept_15&div_id=div_22&menu_id=menu_20.			
Population		Population Density	
122,366		2,188.1 people per square mile	
Diversity		Age	
White	83.8%	Under 18 years	22.2%
Black or African American	5.7%	18–64 years	60.2%
American Indian & Native Alaskan	0.2%	65 years and over	17.7%
Asian	7.9%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$64,507
Some Other Race	0.5%	Poverty Rate	8.4%

Arlington County, VA—Columbia Pike Form Based Code		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation	✓	Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

The Columbia Pike Form Based Code is intended to foster a pedestrian-friendly infill development pattern according to New Urbanism principles. The code arose from a communitywide desire to revitalize "The Pike" and turn it into an attractive main street with mixed-use buildings and Complete Streets. While the code is not mandatory, it does provide a number of significant development incentives. Developers who choose to use the Form Based Code can expect expedited project approvals and lower development fees. The code also allows for the construction of mixed-use buildings in commercially zoned areas.

The effort to establish a form based code was led by the Arlington County Department of Community Planning, Housing and Development. The project benefited from significant interagency cooperation, as other county departments moved forward with projects that supported the values of the form based code and facilitated redevelopment in the corridor. Examples include major bus service improvements along the corridor and multiple capital projects to enhance the pedestrian environment.

The code has been in place since 2003 and appears to be successfully attracting and incentivizing infill development—as of May 2011, eight large private projects have been initiated in the corridor since the code was adopted. For more information about the Columbia Pike Form Based Code, see the Implementation narrative in chapter two; to view the code, visit http://www.arlingtonva.us/departments/CPHD/forums/columbia/CPHDForumsColumbiaColumbiaPikeInitiativeMain.aspx.

Population		Population Density	
207,627		7,323.3 people per square mile	
Diversity		Age	
White	71.7%	Under 18 years	16.5%
Black or African American	8.5%	18–64 years	74.1%
American Indian & Native Alaskan	0.5%	65 years and over	9.4%
Asian	9.6%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$93,806
Some Other Race	5.9%	Poverty Rate	7.2%

Boise City, ID—Subdivision Ordinance		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation	✓	Street Reconstruction	✓
Financing Mechanism		Retrofitting	
Operations, Maintenance and Enforcement			
Description			

Boise's Subdivision Ordinance includes long-standing pedestrian-friendly provisions, such as requirements that the "street patterns in residential neighborhoods shall be designed for the needs of the bicyclist, pedestrian, and motor vehicle alike," and provisions that aim to improve streets and pedestrian network connectivity (City of Boise 2011).

For more information on Boise's Subdivision Ordinance, see the Implementation narrative in chapter two, or visit http://www.cityofboise.org/Departments/City_Clerk/PDF/CityCode/Title9/0920.pdf.

Population		Population Density	
205,671		2,913.1 people per square mile	
Diversity		Age	
White	89.0%	Under 18 years	25.3%
Black or African American	1.5%	18–64 years	64.6%
American Indian & Native Alaskan	0.7%	65 years and over	10%
Asian	3.2%	Income	
Native Hawaiian & Other Pacific Islander	0.2%	Median Income	$50,633
Some Other Race	2.5%	Poverty Rate	11.5%

Denver, CO—Strategic Parking Plan		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation	✓	Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
In Denver, the Strategic Parking Plan (SPP) is a "comprehensive, city-wide framework that helps articulate and clarify the vision and approach for parking management in the city and county of Denver. It does not focus on parking management in one area or neighborhood but serves to align policy-makers, city staff, residents, business and property owners, and all other stakeholders so that parking goals outlined in the plan are shared and reflect a common vision for the city as a whole. The SPP explores innovative strategies and parking values from a variety of user perspectives so that the implementation tools set forth can achieve the best balance possible" (City of Denver 2010).			
The plan includes recommendations regarding incremental strategies to manage parking through an asset-management perspective. The plan includes demand management tools, parking location strategies, parking time restrictions, pricing tools, and managed supply recommendations.			
For more information on the Strategic Parking Plan, visit http://www.denvergov.org/Default.aspx?alias=www.denvergov.org/parking.			
Population		Population Density	
205,671		2,913.1 people per square mile	
Diversity		Age	
White	68.9%	Under 18 years	22%
Black or African American	10.2%	18–64 years	66.8%
American Indian & Native Alaskan	1.4%	65 years and over	11.3%
Asian	3.4%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$45,438
Some Other Race	11.9%	Poverty Rate	17.8%

Miami, FL—Miami 21		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation	✓	Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
After five years of planning and development, Miami officially implemented a new form-based zoning code in May 2010. The code, called Miami 21, is guided by the principles of New Urbanism and Smart Growth. It represents the community's vision for the "Miami of the 21st century"—a world-class city with well-balanced development, a high quality of life, and vibrant, walkable neighborhoods. The code's guiding principles favor infill growth, encouraging new development at transit nodes to avoid sprawl. Emphasis on mixed-use development, concealed parking, and ground-level activity fosters concrete enhancements to the pedestrian environment. Miami 21 represents a marked break with the city's former code, and its creation required significant cooperation among stakeholders and government agencies. While the code is still relatively new, the planning community widely regards it as a success. In 2011, Miami 21 received the American Planning Association's National Planning Award of Excellence for Best Practice. Even with these early encouragements, Miami's Planning Department considers Miami 21 to be a living document, noting that as implementation progresses, amendments will be made to accommodate input from developers, architects, and members of the public.			
For more info on Miami 21, see the Implementation Narrative in chapter two, or visit www.miami21.org.			
Population		Population Density	
399,457		10,160.9 people per square mile	
Diversity		Age	
White	72.6%	Under 18 years	21.7%
Black or African American	19.2%	18–64 years	61.2%
American Indian & Native Alaskan	0.3%	65 years and over	17.0%
Asian	1.0%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$29,812
Some Other Race	4.2%	Poverty Rate	26.3%

Palo Alto, CA—Pedestrian Overlay Zone		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation	✓	Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			

Description

Palo Alto has utilized Pedestrian and Transportation Oriented Development overlay zones to improve the pedestrian environment. In one such zone, "the California Avenue Pedestrian and Transit Oriented Development (PTOD) Combining District is intended to allow higher density residential dwellings on commercial, industrial and multi-family parcels within a walkable distance of the California Avenue Caltrain station, while protecting low density residential parcels and parcels with historical resources that may also be located in or adjacent to this area. The combining district is intended to foster densities and facilities that:

(1) Support use of public transportation; (2) Encourage a variety of housing types, commercial retail and limited office uses; (3) Encourage project design that achieves an overall context-based development for the PTOD overlay area; (4) Require streetscape design elements that are attractive to pedestrians and bicyclists; (5) Increase connectivity to surrounding existing and planned pedestrian and bicycle facilities; and (6) Implement the City's Housing Element and Comprehensive Plan" (City of Palo Alto 2011).

For more information on the Palo Alto's Pedestrian Overlay Zones, visit the city's municipal code at http://www.cityofpaloalto.org/depts/clk/municipal_code.asp.

Population		Population Density	
64,403		2,475.3 people per square mile	
Diversity		Age	
White	64.2%	Under 18 years	21.2%
Black or African American	1.9%	18–64 years	63.2%
American Indian & Native Alaskan	0.2%	65 years and over	15.6%
Asian	27.1%	Income	
Native Hawaiian & Other Pacific Islander	0.2%	Median Income	$119,483
Some Other Race	2.2%	Poverty Rate	5.7%

Salem, NH—Depot Village Overlay District		AASHTO District: 1	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation	✓	Street Reconstruction	✓
Financing Mechanism		Retrofitting	
Operations, Maintenance and Enforcement			

Description

Voters in Salem adopted a zoning amendment for the Depot area, establishing a new Depot Village Overlay District. The zoning amendment will allow the town to implement a plan for the redevelopment of this key commercial area. The Overlay District's purpose is to specifically discourage autocentric "strip" projects in favor of mixed-use development that is denser and more pedestrian-friendly. Regulations in the zoning amendment include a number of elements that directly affect the pedestrian environment. Autocentric land uses, such as drive-through restaurants and gas stations, are prohibited, as are parking lots abutting the public right-of-way. The amendment states that walkability should be the primary mobility focus. Measures that enhance the pedestrian experience, such as buried utility lines, street-facing storefronts, and attractive pedestrian-scaled lighting, are also required for new development.

For more information about the Overlay District and the development plan for the Depot area, visit http://www.salemnhprojects.org/project?d=planning&p=85

Population		Population Density	
28,776		1,138.0 people per square mile	
Diversity		Age	
White	92.4%	Under 18 years	25.3%
Black or African American	0.9%	18–64 years	63.2%
American Indian & Native Alaskan	0.1%	65 years and over	11.5%
Asian	3.2%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$70,813
Some Other Race	1.8%	Poverty Rate	3.6%

Spokane, WA—Street Development Standards		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation	✓	Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
Spokane's Street Development Standards, which are part of the Unified Code, include a number of model pedestrian-oriented elements, such as "Adequate access shall be provided to all parcels of land. The street system shall facilitate all forms of transportation including pedestrians, bicycles, vehicles and emergency services" (City of Spokane 2011). For more information on Spokane's Street Development Standards, visit http://www.spokaneplanning.org/current.html.			
Population		Population Density	
208,916		3,387.0 people per square mile	
Diversity		Age	
White	86.7%	Under 18 years	24.8%
Black or African American	2.3%	18–64 years	61.2%
American Indian & Native Alaskan	2.0%	65 years and over	14%
Asian	2.6%	Income	
Native Hawaiian & Other Pacific Islander	0.6%	Median Income	$39,306
Some Other Race	1.3%	Poverty Rate	18.6%

Financing Mechanism

Ann Arbor, MI—Local Resolution for Dedicated Non-motorized Transportation Funding		AASHTO Region: 3	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism	✓	Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
In Michigan, Public Act 51 of 1951, referred to as "Act 51," governs state appropriations for transportation programs. The act generates funds through motor fuel and vehicle registration taxes and designates that revenue primarily to three recipients: the State Trunkline Fund, for construction and maintenance of the state trunkline roads and bridges; the Comprehensive Transportation Fund, for capital and operating assistance to public transportation programs; and to local road agencies. Section 10k of Act 51 stipulates that not less than 1% of the funds distributed to the local road agencies will be spent on nonmotorized transportation services or facilities. This source is the primary funding stream for pedestrian and bicycle projects and services across the state.			
Local Resolution R-216-5-04 dedicates 5% of Act 51 funds received by the city annually to nonmotorized transportation uses. As of 2011, Ann Arbor is the only municipality in Michigan that is formally committed to spending more than the state minimum on nonmotorized transportation initiatives.			
For more information on R-216-5-04, nonmotorized transportation funding and planning in Ann Arbor, see the Implementation narrative in chapter two, visit http://www.a2gov.org/government/publicservices/systems_planning/Transportation/Documents/Non-MotorizedPlan_Jan2007.pdf.			
Population		Population Density	
113,934		4,221.1 people per square mile	
Diversity		Age	
White	73.0%	Under 18 years	16.8%
Black or African American	7.7%	18–64 years	75.3%
American Indian & Native Alaskan	0.3%	65 years and over	7.9%
Asian	14.4%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$51,001
Some Other Race	1.0%	Poverty Rate	22.7%

Oklahoma City, OK—Project 180		AASHTO Region: 4	
Category		**Development Applications**	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism	✓	Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

By the mid-2000s, Oklahoma City's downtown streets were primarily multilane one-ways, featuring excessively long turning lanes. The road conditions enabled, or even encouraged drivers to travel at near-highway speeds. The pedestrian environment also left a great deal to be desired. Street trees were few, blocks were long, and little street furniture existed. The city has since responded with a tremendous effort to improve the pedestrian environment in the downtown area with several massive public projects and infrastructure upgrades that have collectively become known as Project 180.

Devon Energy Corporation, headquartered in Oklahoma City, decided to pursue the construction of a new consolidated corporate headquarters tower in the Central Business District. Devon entered a Tax Increment Financing (TIF) agreement with the city that made available $95 million in TIF funding for downtown public works improvements, thus enabling Project 180. The TIF agreement included the unusual proviso that Devon would be the sole holder of the TIF bonds. In effect, Devon is lending the city the upfront cash necessary to make the streetscape improvements, while that loan will be repaid through annual ad valorum taxes that would come due once the new headquarters is built.

For more information on Project 180, see the Implementation Narrative in chapter two, or visit http://www.okc.gov/project180/.

Population		**Population Density**	
579,999		833.8 people per square mile	
Diversity		**Age**	
White	62.7%	Under 18 years	25.5%
Black or African American	15.1%	18–64 years	63.0%
American Indian & Native Alaskan	3.5%	65 years and over	11.5%
Asian	4.0%	**Income**	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$42,181
Some Other Race	9.4%	Poverty Rate	17.3%

Olympia, WA—Parks and Sidewalks Funding Measure		AASHTO Region: 4	
Category		**Development Applications**	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism	✓	Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

In the 1990s, Olympia faced a major deficiency in pedestrian infrastructure. Decades of autocentric suburban development patterns led to many low-density, poorly connected subdivisions along rural roads. Sidewalk construction was often neglected during this period. By the early 1990s, more than half the existing major roads in the city were without sidewalks, and residents found it difficult to walk to key destinations or for recreation. In recent years, Olympia has seen a major increase in sidewalk infrastructure thanks to a sidewalk funding measure approved in 2004. The measure called for a 3% increase in the private utility tax to pay for parks and recreation facilities. One-third of the proceeds were designated for sidewalk construction, increasing funding for sidewalk construction from $150,000 to $1 million per year. The passage of this funding measure was the result of a substantial effort on behalf of walking advocates, volunteer members of the Bicycle and Pedestrian Advisory Committee, and City Council members over almost 10 years. The funding measure has greatly accelerated sidewalk construction in Olympia, significantly increasing the city's walkability.

For more information about the funding measure, see the Olympia case study in chapter three, or visit http://olympiawa.gov/news-and-faq-s/parks-and-pathways-project.aspx.

Population		**Population Density**	
46,478		2,544.4 people per square mile	
Diversity		**Age**	
White	83.7%	Under 18 years	21.5%
Black or African American	2.0%	18–64 years	65.2%
American Indian & Native Alaskan	1.1%	65 years and over	13.3%
Asian	6.0%	**Income**	
Native Hawaiian & Other Pacific Islander	0.4%	Median Income	$51,435
Some Other Race	1.8%	Poverty Rate	14.9%

Olympia, WA—Transportation Impact Fees		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism	✓	Retrofitting	
Operations, Maintenance and Enforcement			
Description			
In accordance with the Washington State Growth Management Act, the city of Olympia has charged Transportation Impact Fees (TIFs) to developers of new construction since 1995. The fees are used to offset the costs of the transportation system improvements that new growth necessitates. While TIF revenues cannot be applied to stand-alone pedestrian projects under the current state guidelines, the city has successfully leveraged the fees to enhance the pedestrian environment through the development of multimodal street standards and strategic allowances for TIF reductions. Olympia's TIF program has benefited from a local and regional commitment to facilitating nonmotorized transportation improvements, and recent planning activities suggest that the city may be able to increase the role of TIFs in financing nonmotorized transportation improvements in the future.			
For more information about Olympia's TIF program, see the Olympia case study in chapter three, or visit http://olympiawa.gov/city-services/transportation-services/plans-studies-and-data/Impact-Fees.aspx			
Population		Population Density	
46,478		2,544.4 people per square mile	
Diversity		Age	
White	83.7%	Under 18 years	21.5%
Black or African American	2.0%	18–64 years	65.2%
American Indian & Native Alaskan	1.1%	65 years and over	13.3%
Asian	6.0%	Income	
Native Hawaiian & Other Pacific Islander	0.4%	Median Income	$51,435
Some Other Race	1.8%	Poverty Rate	14.9%

Oregon—Dedication of State Highway Funds for Pedestrian and Bicycle Improvements		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism	✓	Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
"In 1971, the Oregon Legislature passed the landmark 'Bike Bill' (ORS 366.514). The law requires ODOT, cities and counties to 1) spend 'reasonable' amounts—a minimum of one percent—of their share of the State Highway Fund on walkways and bikeways, and 2) Include walkways and bikeways as part of road construction projects, with three exceptions: where there is no need, where the cost is too high in proportion to need, or where it would be unsafe" (Oregon Department of Transportation 2010).			
For more information on the Oregon's transportation funding formula, visit http://www.oregon.gov/ODOT/COMM/about_us.shtml.			
Population		Population Density	
3,831,074		35.6 people per square mile	
Diversity		Age	
White	83.6%	Under 18 years	24.7%
Black or African American	1.8%	18–64 years	62.5%
American Indian & Native Alaskan	1.4%	65 years and over	12.8%
Asian	3.7%	Income	
Native Hawaiian & Other Pacific Islander	0.3%	Median Income	$49,033
Some Other Race	5.3%	Poverty Rate	13.6%

Sacramento, CA—Local Sales Tax for Transportation Projects		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism	✓	Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
In 2004, the Sacramento City Council passed Local Ordinance STA 04-01, which includes a 0.5% retail sales tax to be used by the Sacramento Transportation Authority for local transportation purposes. Acceptable uses include planning, engineering and design, construction, maintenance, and operation of bicycle and pedestrian facilities.			
For more information on STA 04-01, visit http://www.sacta.org.			
Population		Population Density	
466,488		4,189.2 people per square mile	
Diversity		Age	
White	45.0%	Under 18 years	27.3%
Black or African American	14.6%	18–64 years	61.2%
American Indian & Native Alaskan	1.1%	65 years and over	11.4%
Asian	18.3%	Income	
Native Hawaiian & Other Pacific Islander	1.4%	Median Income	$50,381
Some Other Race	12.3%	Poverty Rate	16.5%

Salisbury, NC—Sidewalk Program		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism	✓	Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			
Salisbury, North Carolina, has adopted a Land Development Ordinance that requires developers to construct sidewalks along both sides of any new street, and along any street frontage on existing streets that lack a sidewalk, including infill developments. The requirement applies to any proposed subdivision or new development. The ordinance includes a Sidewalk Payment in Lieu Program whereby developers can opt to pay a fee, based on the current cost of sidewalk construction, toward the construction of priority sidewalks elsewhere in the city rather than construct the sidewalk along the new development.			
For more information on Salisbury's Land Development Ordinance and Sidewalk Program, see the Implementation narrative in chapter two, or visit http://www.ci.salisbury.nc.us/.			
Population		Population Density	
33,662		1,488.3 people per square mile	
Diversity		Age	
White	52.4%	Under 18 years	21.8%
Black or African American	37.7%	18–64 years	58.4%
American Indian & Native Alaskan	0.4%	65 years and over	19.9%
Asian	1.6%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$40,247
Some Other Race	5.9%	Poverty Rate	19.1%

San Diego County, CA—TransNet Tax Extension		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism	✓	Retrofitting	✓
Operations, Maintenance and Enforcement			
Description			

For several decades, San Diego's regional transportation network has benefited from a half-cent sales tax for local transportation projects called TransNet. The San Diego Association of Governments, the regional transportation planning agency for San Diego County, administers the TransNet program. The original TransNet program, first approved in 1988, was set to expire in 2008. Regional leaders and planners debated a great deal about the future of TransNet leading up to the extension vote. Balancing the immediate needs of automobile users with the long-term Regional Comprehensive Plan goals of multimodal planning and Smart Growth proved to be a significant challenge, and the need to secure a two-thirds majority vote enhanced the pressure. In the end, just over 67% of San Diego County voters approved the extension. The new version of TransNet included a 2% allocation of funds for bicycle paths and facilities, pedestrian improvements, and neighborhood safety projects. An additional 2% was dedicated to a new Smart Growth Incentive Program. The agency expanded TransNet's impact on the pedestrian environment by adopting a routine accommodation policy mandating the appropriate consideration of bicycles and pedestrians in all new roadway projects funded by TransNet. While reducing automobile dependency remains a challenge in the Southern California region, the reliability of a dedicated funding source and a routine accommodation policy have facilitated improvements to the pedestrian environment in San Diego County.

For more information about the TransNet program, see the Implementation narrative in chapter two, or visit http://www.sandag.org/.

Population		Population Density	
3,095,313		670.0 people per square mile	
Diversity		Age	
White	64.0%	Under 18 years	25.7%
Black or African American	5.1%	18–64 years	63.1%
American Indian & Native Alaskan	0.9%	65 years and over	11.2%
Asian	10.9%	Income	
Native Hawaiian & Other Pacific Islander	0.5%	Median Income	$62,901
Some Other Race	13.6%	Poverty Rate	11.5%

Operations, Maintenance, and Enforcement

Burlington, VT—Traffic Calming and Neighborhood Enhancement Program		AASHTO Region: 1	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement	✓		
Description			

In 1996, Burlington implemented a Traffic Calming and Neighborhood Enhancement Program that established policies and processes for addressing neighborhood concerns about growing traffic in the community. The objectives of the community driven program are to (1) contribute to roadway safety, especially for children, by influencing conflict points, vehicle speeds, and vehicle volumes; (2) improve the physical environment by lowering vehicle-generated noise, pollution, and disruption; (3) create a green and inviting streetscape; (4) promote safe and pleasant conditions for motorists, bicyclists, pedestrians, and residents on neighborhood streets; and (5) encourage citizen involvement in all phases of neighborhood traffic-calming activities.

For more information on Burlington's Traffic Calming and Neighborhood Enhancement Program, see the Implementation narrative in chapter two, or visit http://www.dpw.ci.burlington.vt.us/transportation/neighborhoods/.

Population		Population Density	
42,417		3,682.0 people per square mile	
Diversity		Age	
White	88.9%	Under 18 years	16.3%
Black or African American	3.9%	18–64 years	73.2%
American Indian & Native Alaskan	0.3%	65 years and over	10.5%
Asian	3.6%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$38,598
Some Other Race	0.6%	Poverty Rate	25.1%

Charlotte, NC—Sidewalk Retrofit Policy		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement	✓		
Description			
The city of Charlotte has adopted a formal policy that guides the installation of sidewalks on existing roadways. The policy includes the installation of sidewalks on both sides of all existing thoroughfares and on one side of all local and collector streets. The policy also provides a prioritization scheme that evaluates existing roadways based on objective criteria. It also allows for citizen nomination of local roads in need of sidewalks. Charlotte's sidewalk retrofit planning process institutionalizes the practice by incorporating the continual prioritization and selection of sidewalk retrofits in the agency's operations. For more information on Charlotte's Sidewalk Retrofit Policy, see the Charlotte case study in chapter three, or visit http://www.charmeck.org/city/charlotte/CityClerk/CouncilRelated/Documents/Agenda%20Attachments/2011/06_13_2011%20bus%20mtg/17.pdf.			
Population		Population Density	
731,424		2,232.4 people per square mile	
Diversity		Age	
White	50.0%	Under 18 years	24.7%
Black or African American	35.0%	18–64 years	66.5%
American Indian & Native Alaskan	0.5%	65 years and over	8.8%
Asian	5.0%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$52,364
Some Other Race	6.8%	Poverty Rate	12.8%

Charlotte, NC—Transportation Action Plan		AASHTO Region: 2	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement	✓		
Description			
The city of Charlotte is committed to becoming "one of the premier cities in the nation for integrating land use and transportation choices" (City of Charlotte 2007). To achieve this vision, the Charlotte City Council adopted the city's first comprehensive transportation plan, known as the Transportation Action Plan (TAP) in May 2006. The TAP consists of a TAP Policy Document and a TAP Technical Document. The TAP describes the policies and implementation strategies to achieve the city's transportation-related goals. The TAP provides citizens, elected officials and staff with a comprehensive plan that includes the city's goals, policies and implementation strategies to achieve the city's transportation vision (City of Charlotte 2011). The TAP includes numerous strategies that address pedestrian safety. There are traffic calming recommendations and pedestrian facility requirements that aim to "make it easier, safer, and more enjoyable for people to walk" (City of Charlotte 2006). For more information on Charlotte's Transportation Action Plan, see the Charlotte case study in chapter three, or visit http://www.charmeck.org/city/charlotte/Transportation/PlansProjects/Pages/Transportation%20Action%20Plan.aspx.			
Population		Population Density	
731,424		2,232.4 people per square mile	
Diversity		Age	
White	50.0%	Under 18 years	24.7%
Black or African American	35.0%	18–64 years	66.5%
American Indian & Native Alaskan	0.5%	65 years and over	8.8%
Asian	5.0%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$52,364
Some Other Race	6.8%	Poverty Rate	12.8%

Chicago, IL - Safe Streets for Chicago		AASHTO Region: 3	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	
Financing Mechanism		Retrofitting	
Operations, Maintenance and Enforcement	✓		
Description			
Pedestrian safety is a major concern in Chicago. The city has experienced numerous high-profile pedestrian crashes and was designated as a pedestrian-safety "Focus City" by the Federal Highway Administration Safety Office. The Safe Streets for Chicago campaign represents a broad effort to address pedestrian safety issues through policy, enforcement, public awareness, technology, and infrastructure improvements. The enforcement component of Safe Streets for Chicago marked a new era of collaboration between Chicago Department of Transportation and the Chicago Police Department. The campaign also benefited from an unprecedented cooperation between these agencies and the Illinois Department of Transportation on efforts to improve the quality of crash data. The overall positive community feedback for the program has led to the steady institutionalization of successful Safe Streets for Chicago efforts and processes.			
For more information about Safe Streets for Chicago, see the Implementation narrative in chapter two, or visit http://www.safestreetsforchicago.org/index.html.			
Population		Population Density	
2,695,598		12,750.3 people per square mile	
Diversity		Age	
White	45.0%	Under 18 years	26.2%
Black or African American	32.9%	18–64 years	63.4%
American Indian & Native Alaskan	0.5%	65 years and over	10.3%
Asian	5.5%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$46,781
Some Other Race	13.4%	Poverty Rate	20.8%

Hoboken, NJ—Hoboken Daylighting		AASHTO Region: 1	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement	✓		
Description			
As an alternative to costly curb extensions, the Hoboken Traffic and Parking Department has developed the practice of "Hoboken Daylighting," referring to "daylighting" intersections by clearing parked cars from the approaches of intersections to improve sightlines. Hoboken Daylighting involves the installation of vertical delineators within 25 ft of problematic crosswalks. The first delineator is installed 10 ft from the crosswalk and 4 ft from the curb, and a second delineator is installed 20 ft from the crosswalk and 4 ft from the curb. These vertical delineators provide a low-cost physical barrier that prevents cars from encroaching on the 25-ft zone, thus creating clearer sight lines and improving crosswalk safety.			
For more information on Hoboken Daylighting, see the Implementation narrative in chapter two, or visit http://www.hobokennj.org/departments/transportation-parking/.			
Population		Population Density	
50,005		30,239.2 people per square mile	
Diversity		Age	
White	82.2%	Under 18 years	10.5%
Black or African American	3.5%	18–64 years	80.5%
American Indian & Native Alaskan	0.1%	65 years and over	9%
Asian	7.1%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$105,710
Some Other Race	4.3%	Poverty Rate	9.4%

Milwaukee, WI—StreetShare Program		AASHTO Region: 3	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	
Financing Mechanism		Retrofitting	
Operations, Maintenance and Enforcement	✓		
Description			

In Milwaukee, StreetShare is a regional pedestrian safety program, funded by the Wisconsin Department of Transportation and a start-up grant from the National Highway Traffic Safety Administration that pursues engineering, education, and enforcement solutions. The Milwaukee Police Department has become a program partner and works closely with neighborhood groups, schools, and business districts to target enforcement of speeding and other safety violations in problem areas. The Police Department has also undergone additional training on driver safety, and police officers pledge to travel the speed limit and yield right-of-way to pedestrians in crosswalks.

For more information on Milwaukee's StreetShare Program, visit http://city.milwaukee.gov/StreetShareProgram17633.htm.

Population		Population Density	
594,833		6,214.3 people per square mile	
Diversity		Age	
White	44.8%	Under 18 years	28.6%
Black or African American	40.0%	18–64 years	60.4%
American Indian & Native Alaskan	0.8%	65 years and over	10.9%
Asian	3.5%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$37,089
Some Other Race	7.5%	Poverty Rate	24.3%

New York, NY—Pedestrian Safety Study and Action Plan		AASHTO Region: 1	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement	✓		
Description			

The New York City Department of Transportation (DOT) has conducted an unprecedented study that looked at the causes and geographic distribution of more than 7,000 pedestrian crashes and identified common factors associated with the crashes. The study examined geographic and design factors such as street width, adjacent land use, nearby transit stops, socioeconomic status, and racial/ethnic composition of neighborhoods. It identified variables that featured significant levels of correlation with pedestrian crashes, and built a statistical model that enabled detailed analysis of crash location and severity. The findings of the study have provided much greater depth and understanding of pedestrian crashes in New York City.

Based on the findings of the study, DOT developed recommendations of actions and policies that were identified as having the greatest potential impact on reducing pedestrian fatalities and severe injuries. On the engineering front, the action plan includes recommendations for daylighting left turns (removing parking spaces to open lines of sight) on a pilot major Manhattan avenue, and taming dangerous traffic behavior at 20 intersections on major two-way crosstown thoroughfares in Manhattan. For enforcement, the plan recommends greater coordination of data collection and sharing between the New York Police Department and DOT, and increased enforcement of laws against distracted driver behavior such as cell phone use. The plan also recommends education and communications campaigns, since the study identified a lack of awareness of basic safety related laws. For example, most New Yorkers do not know that the standard speed limit is 30 miles per hour (many thought it was higher).

For more information on DOT's Pedestrian Safety Study and Action Plan, see the New York City case study in chapter three, or visit http://www.nyc.gov/html/dot/html/about/pedsafetyreport.shtml.

Population		Population Density	
8,175,133		26,402.9 people per square mile	
Diversity		Age	
White	44.0%	Under 18 years	24.2%
Black or African American	25.5%	18–64 years	64.1%
American Indian & Native Alaskan	0.7%	65 years and over	11.7%
Asian	12.7%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$50,173
Some Other Race	13.0%	Poverty Rate	18.6%

New York, NY—Pedestrian Safety Study and Action Plan		AASHTO Region: 1	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement	✓		
Description			

The New York City Department of Transportation has created a program that works with selected not-for-profit organizations to create neighborhood plazas throughout New York City. The program transforms underutilized or dangerous streets into vibrant public places.

In the words of the program's website, "The NYC Plaza Program will re-invent New York City's public realm. In New York City, the public right-of-way comprises 64 square miles of land-that is enough space to fit about 50 Central Parks. The Program will re-claim streets at appropriate locations to make new plazas. Sites will be selected based on the following criteria: Open Space, Community Initiative, Site Context, Organizational & Maintenance Capacity, and Income Eligibility. Eligible not-for-profit organizations can propose new plaza sites for their neighborhoods through a competitive application process. The City will prioritize sites that are in neighborhoods that lack open space, and will look to partner with community groups that commit to operate, maintain, and manage these spaces so they are vibrant pedestrian plazas."

For more information on the NYC Plaza Program, see the New York City case study in chapter three, or visit http://www.nyc.gov/html/dot/html/sidewalks/publicplaza.shtml.

Population		Population Density	
8,175,133		26,402.9 people per square mile	
Diversity		Age	
White	44.0%	Under 18 years	24.2%
Black or African American	25.5%	18–64 years	64.1%
American Indian & Native Alaskan	0.7%	65 years and over	11.7%
Asian	12.7%	Income	
Native Hawaiian & Other Pacific Islander	0.1%	Median Income	$50,173
Some Other Race	13.0%	Poverty Rate	18.6%

Olympia, WA—Transportation Mobility Strategy		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	✓
Architectural and Urban Design Guideline		Infill Development	✓
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement	✓		
Description			

Olympia's Transportation Mobility Strategy is a guidance document that makes specific recommendations for enhancing the city's multimodal approach to transportation planning and development. It takes direction from the vision and goals of Olympia's Comprehensive Plan, existing city transportation and land use plans, and new data. The strategy is organized around six policy themes. Each theme is supported with an initial work plan for the city. Many elements of the strategy are currently being integrated into the city's Comprehensive Plan update, and Olympia's Public Works Department has begun to implement parts of the work plans for the various policy themes. These initial implementation efforts include a commute trip reduction campaign, the development of a route directness measurement tool, and initial steps toward revising the city's Transportation Impact Fees and concurrency programs. In this area, Olympia is studying successful models for measuring level of service based on person trips rather than automobile trips and exploring the possibility of adding nonmotorized infrastructure improvements to the list of projects eligible for Transportation Impact Fee funding. These early implementation efforts suggest that the strategy will continue to strengthen and further institutionalize the city's support for nonmotorized modes in transportation planning.

For more information, see the Olympia case study in chapter three, or visit http://olympiawa.gov/city-services/transportation-services/plans-studies-and-data/Plans%20and%20Studies%20-%20Mobility%20Strategy.aspx.

Population		Population Density	
46,478		2,544.4 people per square mile	
Diversity		Age	
White	83.7%	Under 18 years	21.5%
Black or African American	2.0%	18–64 years	65.2%
American Indian & Native Alaskan	1.1%	65 years and over	13.3%
Asian	6.0%	Income	
Native Hawaiian & Other Pacific Islander	0.4%	Median Income	$51,435
Some Other Race	1.8%	Poverty Rate	14.9%

Seattle, WA—Prioritization of Pedestrian Projects		AASHTO Region: 4	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement	✓		
Description			
Seattle's Pedestrian Master Plan places great emphasis on the value of data and informed decisions regarding projects and programs that can improve and support pedestrian activity. The city has collected and analyzed detailed data regarding safety, equity, vibrancy, and health, as well as information on the quality of the pedestrian environment and expected pedestrian activity. Prioritization of pedestrian projects is guided by a High Priority Areas Map that weights potential pedestrian demand, equity—locations where pedestrian improvements will serve community residents with the greatest needs—and corridor function—the role of the corridor in the transportation network.			
For more information on Seattle's High Priority methodology, visit http://www.seattle.gov/transportation/pedestrian_masterplan/.			
Population		Population Density	
608,660		6,717.0 people per square mile	
Diversity		Age	
White	69.5%	Under 18 years	15.6%
Black or African American	7.9%	18–64 years	72.4%
American Indian & Native Alaskan	0.8%	65 years and over	12%
Asian	13.8%	Income	
Native Hawaiian & Other Pacific Islander	0.4%	Median Income	$58,990
Some Other Race	2.4%	Poverty Rate	12.2%

Tippecanoe County, IN—Annual Transportation Hot Spot List		ASSHTO Region: 3	
Category		Development Applications	
Engineering and Design Guideline		New Development	
Architectural and Urban Design Guideline		Infill Development	
Land Development Regulation		Street Reconstruction	✓
Financing Mechanism		Retrofitting	✓
Operations, Maintenance and Enforcement	✓		
Description			
Residents of Tippecanoe, Indiana, are encouraged to advise the county on problematic locations within the jurisdiction. Through the use of an online submission form or in written suggestions to the county's Citizen Participation Committee, residents can identify specific locations where there are traffic, roadway, safety, or pedestrian and cyclist concerns relating to various issues. The submission form requires a brief description of the problem. The county then compiles a yearly Hot Spot List of the top locations and concerns. This list helps the county's Transportation Department focus its funding priorities and planning efforts. Pedestrian issues frequently appear on the list.			
For more information on the Annual Hot Spot List, visit http://www.tippecanoe.in.gov/apc/division.asp?fDD=28-30.			
Population		Population Density	
172,780		298.0 people per square mile	
Diversity		Age	
White	84.0%	Under 18 years	20.9%
Black or African American	4.0%	18–64 years	70%
American Indian & Native Alaskan	0.3%	65 years and over	9.1%
Asian	6.2%	Income	
Native Hawaiian & Other Pacific Islander	0.0%	Median Income	$41,842
Some Other Race	3.3%	Poverty Rate	20.6%

APPENDIX B

Interview Preparation Guide

NCHRP Project 20-5: Synthesis Topic 42-11

Local Policies and Practices That Support Safe Pedestrian Environments

The benefits of attractive and safe pedestrian environments are numerous and diverse. However, creating attractive and safe pedestrian environments is a complex challenge that relies on the delicate interplay between physical design and policy. Many communities around the country—like yours—have decided to face that challenge head-on and adopt a variety of regulatory, administrative, and financial practices designed to fund, require, and otherwise promote pedestrian facilities and activity.

The Transportation Research Board (TRB), through its National Cooperative Highway Research Program (NCHRP), is undertaking a synthesis that will document the wide array of regulatory, financial, and administrative practices used by communities to provide pedestrian-friendly environments. The synthesis will include various types of design guide-lines, land development regulations, financing mechanisms, operations, maintenance and enforcement measures. It is TRB's intention that such a synthesis of these practices will inform and assist other communities to implement pedestrian-related improvements.

In the course of conducting research for this synthesis, your name arose as contact information regarding _____. If you are willing and able to discuss the initiative, the research team would like to briefly interview you to inform the synthesis report.

The interview will be conducted over the phone, will last approximately thirty (30) minutes, and will be conversational in nature. Some of the themes and issues that the research team would like to discuss with you regarding the regulatory, admin-istrative, or financial practice that you utilized are:

- The Goals and Objectives – What are the goals and objectives of the practice?
- The Players Involved – Who initiated the implementation of the practice? What is the legal framework for the adoption of the practice? Did the practice require interagency cooperation in the planning or implementation phases? Under what authority was that cooperation enabled? Was there political support? Was there a champion for the practice? Was there community-driven support? Were other key staff involved?
- Challenges – Were there legal or environmental hurdles? Was there opposition to the practice? From where? How were these challenges addressed? What was the cost of the practice and how was it funded?
- Perceptions of Outcomes – Was implementation successful? Has the practice achieved the goals and objectives of the project? How do decision-makers and the general public perceive the practice? How do you measure success for the practice? Does this practice complement other initiatives and what are the perceptions of outcomes for that larger program?
- Lessons Learned – What are the keys to success for implementation? Do you think this practice has applications in other municipalities? In what settings is the practice best applied? Does it have retrofit/new construction applications? Do you have any recommendations for those that would like to employ this practice elsewhere?
- Other Efforts/Individuals – Are there additional efforts ongoing in your community that aim to encourage safe pedes-trian environments? Are there other individuals that you feel the research team should speak with in your community or elsewhere?

The phone interview will be summarized by the researcher into a narrative document that tells the story of your initiative. This narrative may be included in the Final Synthesis Report and would provide high-level guidance for transportation profes-sionals that are interested in undertaking a similar effort. May we include your contact information in the Synthesis Report for further information? Thank you in advance for your participation.

APPENDIX C

Agencies Interviewed

Arlington County, Department of Community Planning Housing and Development, Planning Division

City of Amarillo, Office of Planning

City of Ann Arbor, Systems Planning Unit, Transportation Program Manager

City of Boise, Planning and Development Department

City of Boston, Transportation Department

City of Burlington, Public Works Department

City of Charlotte, Department of Transportation

City of Charlotte, Department of Transportation

City of Chicago, Department of Transportation

City of Chicago, Department of Transportation

City of Hoboken, Director of Transportation and Parking

City of Los Angeles, Department of City Planning

City of Miami, Planning Department

City of Minneapolis, Public Works Department

City of Minneapolis, Public Works Department

City of New York, Department of Transportation

City of New York, Department of Transportation

City of New York, Department of Transportation

City of New York, Department of Design and Construction

City of Olympia, Public Works Department

City of Olympia, Public Works Department

City of Olympia, Public Works Department

City of Oklahoma City, former Assistant City Engineer

City of Oklahoma City, Project 180

City of Salisbury, Planning Division

Clifton Community Partnership

Olympia Safe Streets Campaign

San Diego Association of Governments (SANDAG)

TRANSPORTATION RESEARCH BOARD

500 Fifth Street, N.W.

Washington, D.C. 20001

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