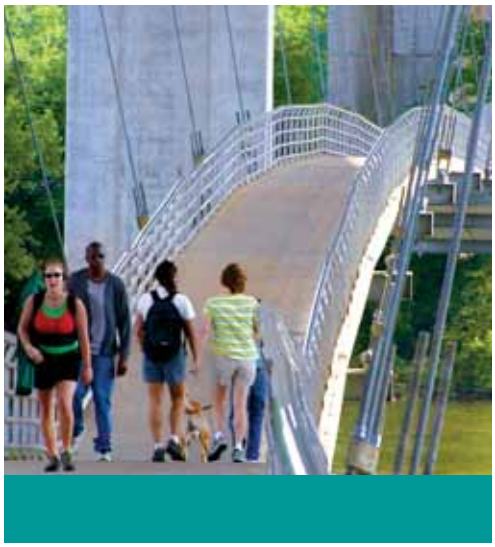
U.S. Department of Transportation
Federal Highway Administration
Federal Transit Administration

Livability in Transportation Guidebook

Planning Approaches that Promote Livability



Acknowledgements

This **first edition** of the *Livability in Transportation Guidebook* is based on research conducted by ICF International with support from AECOM. The primary authors of this document are Harrison Rue, Lisa McNally, Kathleen Rooney, Pepper Santalucia, Mary Raulerson, Jane Lim-Yap, Joel Mann, and Dan Burden, with Guidebook design by Stephanie Bogue. Significant and invaluable discussion, review, and input were provided by the FHWA and FTA project management team and reviewers.

Notice

This report was funded in part through a contract from the U.S. Department of Transportation (USDOT), Federal Highway Administration's Surface Transportation Environment and Planning Cooperative Research Program. This document is disseminated under the sponsorship of the USDOT in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in this document and does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this report only because they are considered essential to the objective of the document. This report does not constitute a standard, specification, or regulation.

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FHWA-HEP-10-028

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Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
APA	American Planning Association
ARC	Atlanta Regional Commission
ARRA	American Recovery and Reinvestment Act
BRT	Bus Rapid Transit
Caltrans	California Department of Transportation
CATS	Charlotte Area Transit System
CCC	Community-Centered Corridor
CDA	Community Design Assistance
CDBG	Community Development Block Grant
CDTC	Capital District Transportation Committee
CMAP	Chicago Metropolitan Agency for Planning
CMAQ	Congestion Mitigation and Air Quality program
CNT	Center for Neighborhood Technology
CNU	Congress for the New Urbanism
COG	Council of Government
CSS	Context Sensitive Solutions
DOT	Department of Transportation
DRC	Development Review Committee
DRCOG	Denver Regional Council of Governments
DWA	Desert Water Agency
EIS	Environmental Impact Statement
EmX	Emerald Express
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	Greenhouse Gas Emissions
H+T	Housing + Transportation Affordability Index
HOV	High-Occupancy Vehicle
HSP	Hillsborough Street Partnership
HUD	Department of Housing and Urban Development
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation Systems
LCI	Livable Centers Initiative
LOS	Level of Service
LRTP	Long-Range Transportation Plan
LTD	Lane Transit District

MaineDOT	Maine Department of Transportation
MDOT	Maryland Department of Transportation
MIS	Major Investment Study
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Commission
MTP	Metropolitan Transportation Plan
NCDOT	North Carolina Department of Transportation
NEPA	National Environmental Policy Act
NYSDOT	New York State Department of Transportation
PennDOT	Pennsylvania Department of Transportation
PPP	Public-Private Partnership
ROW	Right-of-Way
RPO	Rural Planning Organization
RTD	Regional Transportation District
RTP	Regional Transportation Plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users
SCIP	South Corridor Infrastructure Program
SHPO	State Historic Preservation Office
SPO	State Planning Office
STIP	State Transportation Improvement Program
STPA	Sensible Transportation Policy Act
TAC	Transportation Advisory Committee
TCSP	Transportation, Community, and System Preservation
TDM	Travel Demand Management
TDOT	Tennessee Department of Transportation
TEA-21	Transportation Equity Act for the 21st Century
TIF	Tax-Increment Financing
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIGER	Transportation Investment Generating Economic Recovery
TIP	Transportation Improvement Program
TOD	Transit-Oriented Development
TSM	Transportation System Management
UPWP	Unified Planning Work Program
USDOT	U.S. Department of Transportation
VDOT	Virginia Department of Transportation
VMT	Vehicle Miles Traveled
WSDOT	Washington State Department of Transportation

Executive Summary

> By focusing on livability, we can help transform the way transportation serves the American people—and create safer, healthier communities that provide access to economic opportunities.
>
> —Ray LaHood, U.S. DOT,
> Secretary of Transportation

The *Livability in Transportation Guidebook*'s primary purpose is to illustrate how livability principles have been incorporated into transportation planning, programming, and project design, using examples from State, regional, and local sponsors. It is intended to be useful to a diverse audience of transportation agency staff, partners, decisionmakers, and the general public, and is applicable in urban, suburban, and rural areas. While several of the example projects address capacity and operational issues on major roadways, the Guidebook primarily explores how transportation planning and programs can improve community quality of life, enhance environmental performance, increase transportation and housing choice while lowering costs, and support economic vitality. Many of the case studies resolve capacity and operational issues through a multimodal network and systems approach, reflecting better integration of land use with transportation.

Partnership for Sustainable Communities. In June 2009, U.S. Secretary of Transportation Ray LaHood, U.S. Secretary of Housing and Urban Development Shaun Donovan, and U.S. EPA Administrator Lisa P. Jackson announced the new Interagency Partnership for Sustainable Communities to improve access to affordable housing, provide more transportation options, and lower transportation costs while protecting the environment in communities nationwide.

The Partnership established six livability principles to act as a foundation for interagency coordination:

- Provide more transportation choices.
- Promote equitable, affordable housing.
- Enhance economic competitiveness.
- Support existing communities.
- Coordinate policies and leverage investment.
- Value communities and neighborhoods.

The Guidebook provides examples of communities and agencies across the country that have approached today's new livability in transportation context with innovative and practical strategies, using the transportation planning process to guide successful project implementation. Fostering livability in transportation projects and programs will result in improved quality of life; will create a more efficient and accessible transportation network; and will serve the mobility needs of communities, families, and businesses.

Guidebook Organization

The Guidebook includes the executive summary, introduction, six "planning approach" chapters, and a conclusion. A separate appendix provides details about each of the case studies.

- *Project Highlights. Chapter 1* introduces the reader to the 15 primary case studies, organized by project types, to help readers quickly identify cases that are most applicable to their interests.
- *Planning Approaches. Chapters 2 to 7* discuss common challenges experienced in transportation planning and implementation, and approaches used to overcome barriers. Each chapter represents a phase of the transportation planning and project development process:

- *Conclusion. Chapter 8* provides ideas and practical strategies for next steps in implementing livability in transportation planning and projects.
- *Appendix: Case Studies.* The case studies represent a variety of project types, at different scales, community context, and application of the livability principles. They were chosen so that a broad range of users could select from different examples, depending on a given challenge, to overcome

Livability Principles Promoted by Primary Case Studies

	Increase Transportation Choices	Promote Affordable Housing	Enhance Economic Competitiveness	Support Existing Communities	Coordinate Federal Policies & Leverage Funding	Value Existing Communities
Albany, NY—CDTC New Visions Transportation Plan	○	○	○	●	●	●
Atlanta, GA—Livable Centers Initiative	○	○	○	●	●	●
Cathedral City, CA—Palm Canyon Drive Streetscape	●		●	●		●
Charlotte, NC—Integrated Land Use and Transit Planning	●	○	●	●	○	●
Chattanooga, TN —Riverfront Parkway Transportation and Urban Design Plan	●		●	●		●
Denver, CO—FasTracks	●		●	●	○	●
Eugene, OR—Emerald Express Green Line Bus Rapid Transit	●		○	●	○	○
Fargo, ND—Downtown Redevelopment	○	○	●	●	○	●
Loudoun County, VA—Route 50 Rural Traffic Calming	●			●		●
Maine—Gateway Route 1	●	○		●		●
MD—MDOT Transit-Oriented Development Initiative	●	●		●		○
PA—PennDOT Smart Transportation Program	●		●	●	○	●
Raleigh, NC—Hillsborough Street Improvement Project	●		●	●		●
VA/MD—Woodrow Wilson Bridge	●	○			○	
National—Housing + Transportation Affordability Index	○	●		●		●

○ Partly Supports

● Fully Supports

planning and project implementation barriers. The matrix below lists the primary case studies included in the Guidebook in relation to the livability principles that each study reflects.

Visioning (Chapter 2). Transportation practitioners have learned to use visioning to work with a range of partners, address broader issues, and develop more integrated long-term solutions. A vision is by nature forward-thinking, unconstrained, comprehensive, flexible, inclusive and participatory, and linked to action. Visioning helps develop a clear understanding of potential future outcomes, outlines a range of choices, identifies potential impacts and benefits, and is implemented through public and private investment over time.

Planning and Process (Chapter 3). Some transportation agencies have moved beyond established planning and project delivery processes to incorporate livability goals into the planning process, integrating mobility goals with other community needs. Innovative, participatory planning processes can reach more stakeholders, capture real input, and develop creative, integrated plans. Planning and process changes also help align fiscal realities with true costs of transportation projects, leading to improved project delivery.

Policy (Chapter 4). Updated agency policies can set the stage for long-term success in implementing livable transportation projects. Integrated policies can have a lasting and program-wide effect. Applying new policies to projects can help demonstrate an agency's intention and direction. Policy changes support the organizational change needed to implement livability over the long term, but require strong political support, staff engagement, a supportive organizational structure, and external partnerships.

Partnership (Chapter 5). A range of partnership structures have used innovative coordination strategies to advance common goals consistent with the livability principles. Spanning public, private, and nonprofit interests, these partnerships demonstrate collaboration across jurisdictions, within agencies, and with external stakeholders to meet their funding, policy, program or planning goals. Partnerships created early from the ground up can help translate shared visions and goals into realistic projects.

Design (Chapter 6). Delivering livability at the project level requires new design approaches, understanding who will use the system, including them in the design process, and incorporating their input into final design. A well-executed design process builds on early efforts in visioning, planning, and integration of transportation, land use, and housing, bringing them closer to implementation. Conventional design guidance and regulations may require design exceptions to incorporate livability. Some agencies have developed new approaches, policies, and standards to deliver integrated design.

Implementation and Funding (Chapter 7). Aligning transportation investments with livability goals can improve system performance and coordinate additional funding. A practical set of phased improvements coordinated with local development decisions can maximize the effectiveness of existing systems. Implementation of livability into transportation will include new policies at the State, regional, and local levels; strong public, private, and community partnerships; creative multimodal project design; and innovation in building, operating, and maintaining the system.

Conclusion. Building a partnership and process focused on livability can help identify affordable short-term multimodal capacity, safety, and operational improvements, while creating a long-term vision and phased implementation plan for a corridor, transportation system, or region. The strategies identified can be applied to a broad range of projects—from transit systems to regional scenario planning, neighborhood revitalization, rural main streets, county comprehensive plans or statewide policy development. At whatever scale, whichever agency takes the lead, an integrated planning approach can help jump-start short-term projects, support sustainable economic development, and serve as a longer-term model for revitalization of corridors, neighborhoods, cities, and towns throughout the region and State.

Introduction

> Livability means being able to take your kids to school, go to work, see a doctor, drop by the grocery or post office, go out to dinner and a movie, and play with your kids at the park—all without having to get in your car.[1]
>
> —Ray LaHood, U.S. DOT, Secretary of Transportation

Livability in Transportation: Why Now?

America's transportation industry has built one of the world's largest and best highway networks, connecting people, businesses, and communities across the country, linked with extensive public transportation systems in major metro areas. However, we have not yet put the same effort into completing a system that works as well for walking, wheeling, or taking transit in most communities. While nearly four-fifths of Federal transportation funding goes to highway projects, almost 85 percent of people and jobs are in metropolitan areas,[1] which offer the potential for significant improvements in multimodal travel choices. Since metropolitan regions are also where most trade, industry, and congestion occur—and where aging infrastructure requires significant reinvestment—a balanced approach can help maximize the effectiveness of existing transportation investments. The same is true for towns and villages in rural areas, which are struggling to remain economically competitive while preserving community character and maintaining viable mobility options. By targeting transportation funding to support reinvestment in existing communities, we can build more choice, convenience, and cost-effectiveness into the transportation system. Developing complete street networks that provide connectivity and accessibility for all modes is a good place to start. As changing demographics and evolving markets increase demand for compact, walkable neighborhoods with a range of housing choices, transportation planning, programming, management and operations can help ensure that walking, biking, and transit are safe, convenient, and realistic choices for more people, making transportation systems more accessible, efficient and equitable.

In a time of economic challenges and fiscal constraint, limited transportation funds can be more effectively focused on projects that support economic revitalization and community development, while improving transportation and housing affordability and quality of life. By increasing multimodal mobility and access in the existing system, the overall costs of moving people, goods, and services can be reduced, enhancing economic competitiveness. Transportation investments that support community livability can also have multiple co-benefits. Compact, connected communities encourage regular walking, wheeling, and transit use, reducing the need for auto travel—while making trips shorter for those who choose to drive. Less driving helps reduce greenhouse gases (GHGs) and other pollution, lowering energy use and reducing dependence on foreign oil. Compact, connected development patterns require

[1] White House Office of Urban Affairs, blog post August 04, 2009 **http://www.whitehouse.gov/blog/A-Fresh-Conversation-on-the-Future-of-Americas-Cities-and-Metro-Areas**

less land and pavement, reducing stormwater runoff, groundwater pollution, and loss of wildlife habitat, fields, and forests. The daily exercise associated with more active transportation choices has been shown to improve human health, reduce obesity and health care costs, and encourage community social interactions. Even those who drive to a mixed-use "park-once" district (or traditional downtown) find they can get exercise and social connections without having to drive between every destination—if a safe walking and wheeling network is in place.

By incorporating livability principles into transportation plans and programs, communities can maximize the efficiency of existing transportation investments while providing better access within and between activity centers. Livability approaches can also be a catalyst for reinvesting in aging suburban corridors, restoring complete streets and networks, and revitalizing rural small towns. A transportation system that provides reliable, safe access to jobs, education, health care and goods and services is every bit as important to rural communities as it is to urban areas. Rural communities present unique mobility challenges, and the types of transportation options needed in rural areas can be different in order to ensure access for older citizens to services and activities, and to improve connections and service between communities. Linking transportation investments to compact development and revitalization strategies can preserve natural and cultural resources, while better preparing communities to mitigate and adapt to the impacts of climate change. Making sure that people of all ages have real choices to walk and wheel in the course of daily living, and making communities age-friendly, can support active living, and help improve health and quality of life.

This Guidebook provides examples of communities and agencies across the country that have taken on these challenges by approaching today's new livability in transportation context with innovative and practical strategies, using the transportation planning process to guide successful project implementation.

Livability in Transportation: Background

Incorporating livability into transportation planning, programs, and projects is not a new concept. Communities, developers, advocacy groups, businesses, and neighborhood residents have been working for generations to make places more livable through transportation initiatives with varying degrees of support from local, regional, State, and Federal agencies. These initiatives have used a range of names to describe an overlapping set of objectives and strategies—livability, sustainability, smart growth, walkable communities, new urbanism, healthy neighborhoods, active living, transit-oriented development (TOD), complete streets, and many others. While advocates for each approach or "brand name" might find differences, most transportation industry practitioners understand the common element is that transportation planning is no longer a stand-alone exercise. Increasingly, transportation planning and project development are being more fully integrated with broader community goals, addressing a wider range of needs and leveraging the effectiveness of other programs. As the examples in this Guidebook demonstrate, linking transportation planning with land use decisions, environmental protection, and economic development can lead to more comprehensive, cost-effective solutions and broad community support.

Although most successful livability initiatives and projects generally have been implemented at the regional and local level, there has also been a long history of Federal and State support for related efforts. The U.S. Department of Transportation (U.S. DOT), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) have initiated a number of programs and approaches to protect the human and natural environment, increase mode choice, improve safety, and foster livable communities. Much of this support has focused on Metropolitan Planning efforts, scenario planning, and programming that links local and state planning. Support has included development and broad promotion of a Context Sensitive Solutions approach; support for walkable communities, traffic calming, and Safe Routes to School; inclusion of land use

and economic development factors in transportation planning and in project evaluation criteria for funding transit capital investments; program support and expanded funding eligibilities for TOD; incentives for engaging private investment in joint development projects near transit; to recent policy support for incorporating safe and convenient walking and bicycling facilities into transportation projects to meet the needs of all users and modes. The U.S. DOT efforts have also included developing programs such as the Transportation, Community, and System Preservation (TCSP) Program, which funded a number of innovative planning efforts linking transportation, housing, land use, and environment; and enhancement projects that are required components of applicable FHWA and FTA funding programs. The U.S. DOT has initiated research and planning to address climate change mitigation and adaptation, as well as sustainability, in transportation.

Livability became a popular topic in the 1980s as planners began studying shifts in development patterns from the decline of urban centers to rapidly growing suburban areas. At the time, a controversial issue in transportation planning was the extent to which major highway investments—coupled with very limited availability of alternative modal options—were helping to encourage the development of low-density, single-use, car-dependent settlement patterns, and whether it was economically worthwhile to move infrastructure from cities to suburbs. Numerous studies challenged traditional growth assumptions—including a series of landmark reports that highlighted regions that were "pioneering a wide range of innovative efforts to make communities more livable"[2] and promoting sustainable growth in jobs, housing and transportation in economically, environmentally, and socially smart ways. Advocacy groups and coalitions including arts, preservation, and community organizations also focused on social and environmental equity challenges.

Efforts in the late 1980s and early 1990s highlighted the importance of community and urban design as a tool for solving integrated transportation, land use, housing, and environmental challenges. This included the birth of new urbanism, a coalition of urban designers, developers, and transportation professionals; community-based programs to create more walkable communities; traffic calming projects; and public-private efforts to expand transit and TOD. Publicly-funded transit programs were increasingly viewed as critical community anchors and catalysts for more concentrated economic growth and development. In 1996, FTA published Building Livable Communities with Transit, which outlines key steps in the transportation planning and project development process to promote investments more strategically tuned to communities' needs.[3] A range of these community design concepts, coupled with the growing popularity of innovative public policy, flexible funding, and environmental preservation strategies, were also adopted by many States and local governments. Although the result of these policies and innovative planning strategies was collectively referred to as smart growth, several States used their own brand name for similar initiatives (e.g., Quality Growth, Keystone Principles.). Since the 1990s, the U.S. Environmental Protection Agency (EPA) has run the Smart Growth Program, providing technical assistance to localities and States, research and publications, support for conferences, and an awards program that continues today.

[2] *Building Livable Communities, A Report from the Clinton-Gore Administration*, revised June 2000—p. 17

[3] **http://safety.fhwa.dot.gov/ped_bike/docs/livable.pdf**

Livability in transportation is about using the quality, location, and type of transportation facilities and services available to help achieve broader community goals such as access to good jobs, affordable housing, quality schools, and safe streets. This includes addressing road safety and capacity issues through better planning and design, maximizing and expanding new technologies such as intelligent transportation systems (ITS) and quiet pavements, and using travel demand management (TDM) approaches in system planning and operations. It also includes developing high quality public transportation to foster economic development, and community design that offers residents and workers the full range of transportation choices. And, it involves strategically connecting the modal pieces—bikeways, pedestrian facilities, transit services, and roadways—into a truly intermodal, interconnected system.

Sustainable transportation provides exceptional mobility and access to meet development needs without compromising the quality of life of future generations. A sustainable transportation system is safe, healthy, and affordable, while limiting emissions and use of new and nonrenewable resources. It meets the needs of the present without depleting resources or harming the environment. It also considers the long-term economic health and equity—or social fairness—of a community. Based on principles learned from the Iroquois tribe, Thomas Jefferson wrote that "the earth belongs to the living. No man may by natural right oblige the lands he owns or occupies, or those that succeed him in that occupation, to debts greater than those that may be paid during his own lifetime. Because if he could, then the world would belong to the dead and not to the living."

Smart growth focuses growth in existing communities to avoid sprawl; and advocates compact, transit-oriented, walkable, bicycle-friendly land use, including neighborhood schools, complete streets, and mixed-use development with a range of housing choices. Its goals are to achieve a unique sense of community and place; expand the range of transportation, employment, and housing choices; equitably distribute the costs and benefits of development; preserve and enhance natural and cultural resources; and promote public health.

Partnership for Sustainable Communities. In June 2009, U.S. Secretary of Transportation Ray LaHood, U.S. Secretary of Housing and Urban Development Shaun Donovan, and U.S. EPA Administrator Lisa P. Jackson announced the new Interagency Partnership[2] for Sustainable Communities to improve access to affordable housing, provide more transportation options, and lower transportation costs while protecting the environment in communities nationwide. The Partnership established six livability principles to act as a foundation for interagency coordination (see box on page 5). Fostering livability in transportation projects and programs will result in improved quality of life, create a more efficient, more accessible transportation network, and serve the mobility needs of communities, families, and businesses. The interagency promotion of livability aims to help America's neighborhoods become safer, healthier, and more vibrant. The Partnership will encourage livability principles to be incorporated into Federal programs, while better protecting the environment, promoting equitable development, and helping to address the challenges of climate change.

The Partnership is already making significant progress in coordinating programs and aligning available funding with the livability principles. The U.S. DOT's recent $1.5 billion Transportation Investment

Generating Economic Recovery (TIGER) Discretionary Grant Program included reviews by an interagency team, and awarded more than 50 high priority innovative transportation projects across the country. Twenty-two of these projects will promote livable communities by creating transportation options and improving access to economic and housing opportunities. A second round of TIGER funding is under way (at the time of this guidebook's publication), and will be coordinated with award of Department of Housing and Urban Development (HUD) Challenge grants for accessible affordable housing. Similarly, FTA is allocating funds to innovative Bus, Bus Facility, and Urban Circulator projects—including streetcars—to further advance the six livability principles. Using available funds that do not require new appropriations, FTA will deliver tangible livability improvements within existing programs. This initiative will demonstrate the value of these investments to achieve the livability principles while helping to inform the next surface transportation program reauthorization. The new HUD Sustainable Communities Grant Program will provide approximately $100 million for regional integrated planning initiatives. HUD and U.S. DOT are also cooperating in a joint $75 million competitive grant program that will be awarded to projects that link transportation improvements with housing development. For the first time, HUD and U.S. DOT are participating in EPA's annual technical assistance projects under their Smart Growth Implementation Assistance (SGIA) Program. The SGIA Program helps communities incorporate smart growth strategies into their policies and projects.

The Livability Principles

- **Provide more transportation choices**. Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.
- **Promote equitable, affordable housing**. Expand location-and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Enhance economic competitiveness**. Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers, as well as expanded business access to markets.
- **Support existing communities**. Target Federal funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.
- **Coordinate and leverage Federal policies and investment**. Align Federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.
- **Value communities and neighborhoods**. Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

Purpose of the Guidebook

The *Livability in Transportation Guidebook*'s primary purpose is to illustrate how livability principles have been successfully incorporated into transportation planning, programming, and project design, using examples from State, regional, and local sponsors, applicable in urban, suburban, and rural areas. It is intended to be useful to a diverse audience, including staff from FHWA, FTA, State departments of transportation (DOTs), Metropolitan Planning Organizations (MPOs), transit agencies, local governments, other partnering agencies, community organizations, advocacy groups, business and developers, academic institutions, and the general public.

While several of the projects address capacity and operational issues on major transportation facilities, the Guidebook—like overall livability initiatives—primarily explores how transportation planning and programs can improve community quality of life, enhance environmental performance, increase transportation and housing choice while lowering costs, and support economic vitality. Many of the case studies resolve capacity and operational issues through a multimodal network and systems approach, along with better integration of land use with transportation to lessen the need for automobile travel.

Since the overall topic area is comprehensive and complex, the Guidebook is not a detailed, step-by-step "how-to" guide for planning or implementing specific projects. Instead, it is intended to be an overview on the importance of livability in transportation, to encourage transportation practitioners to think more broadly about project goals, enlist more partners, and develop more integrated solutions that support community livability. By highlighting elements in the case studies that worked well—practical strategies, processes, applications, and common techniques, it should encourage the reader to "try something new" to promote livability in transportation. The Guidebook illustrates how good planning practice has been applied to a variety of transportation projects that are consistent with the livability principles, and provides examples for local practitioners undertaking similar projects.

About the Guidebook

The case studies in this Guidebook represent a variety of projects ranging in scale and community context. Each demonstrates how the livability principles can be used to address and overcome planning and project implementation barriers.

The Guidebook was developed with the recognition that livability means different things to different communities, and that planning and implementation need to be tailored to the needs of individual communities. The case studies vary across modes, types of planning, facilities, and location. They are applicable to a broad range of users—from transportation practitioners to community advocacy groups—allowing readers to select from a variety of "livability in action" examples, depending on a given planning or implementation challenge.

Guidebook Organization

The Guidebook consists of the following sections:

- *Executive Summary.* Outlines key case study findings, lessons learned, and best practices in promoting livability, and provides an overview of actions that practitioners and communities can take to promote livability in transportation projects.
- *Project Highlights.* Chapter 1 introduces the reader to the 15 primary case studies, organized by common transportation project types. The purpose of this chapter is to help readers quickly identify in the Guidebook those cases that are most applicable to their interests in promoting livability in project planning and development. Project types discussed in this chapter include:
    - Rail Transit and Transit Oriented Development
    - Corridor-Focused Bus Rapid Transit and Boulevard/Multi-way
    - Regional Transportation and Land Use Planning
    - Statewide Policy Approach
    - Statewide Corridor Approach
    - Rural Roadways
    - Redevelopment

- Right-Sizing/Road Diet
- Multimodal Bridges
- Transportation and Housing Affordability

- *Planning Approaches. Chapters 2 to 7* discuss common challenges experienced in transportation planning and implementation, along with approaches used to overcome barriers. Each chapter represents a phase of the transportation planning and project development process:

The organization of the approach chapters fits well with how transportation agencies think about projects—moving from idea to implementation.

Primary Case Studies Organized by Chapter

	Chapter 2: **Visioning**	Chapter 3: **Planning and Process**	Chapter 4: **Policy**	Chapter 5: **Partnership**	Chapter 6: **Design**	Chapter 7: **Implementation and Funding**
Albany, NY—CDTC New Visions Transportation Plan	✓	✓		✓		✓
Atlanta, GA—Livable Centers Initiative			✓			✓
Cathedral City, CA—Palm Canyon Drive Streetscape					✓	✓
Charlotte, NC—Integrated Land Use & Transit Planning		✓	✓	✓		✓
Chattanooga, TN —Riverfront Parkway Transportation and Urban Design Plan					✓	✓
Denver, CO—FasTracks				✓		✓
Eugene, OR—Emerald Express Green Line Bus Rapid Transit	✓					✓
Fargo, ND—Downtown Redevelopment						✓
Loudoun County, VA—Route 50 Rural Traffic Calming	✓	✓		✓	✓	✓
Maine—Gateway Route1	✓	✓		✓		✓
Maryland DOT Transit-Oriented Development Initiative			✓			✓
Pennsylvania—PennDOT Smart Transportation Program			✓			✓
Raleigh, NC—Hillsborough Street Improvement Project					✓	✓
Virginia/Maryland—Woodrow Wilson Bridge					✓	✓
National—Housing + Transportation Affordability Index			✓			✓

- *Chapter 8* concludes the Guidebook, offering practical, accessible recommendations for integrating livability into transportation planning and implementation. Suggested next steps may be relevant to a broad base of potential users, from transportation professionals working at different levels of government, to the private sector, to the community.
- *Appendix.* This stand-alone document provides detailed information about each of the 15 primary case studies referenced throughout the Guidebook. Case study details include agencies involved, when the project was initiated and completed, cost, contact information, interviewees, and other related resources.

Introduction—Endnotes

1. US DOT Livability Webinar. September 24, 2009. **http://www.contextsensitivesolutions.org/content/webinar/livability/**. Accessed June 25, 2010.
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1. Project Highlights

This chapter introduces the 15 primary case studies discussed in this Guidebook, organized by transportation project type. The purpose of this chapter is to help readers identify examples that are most applicable to their interests, based on project type, for promoting livability in project planning and development. (See the Appendix for more detailed information about each of the 15 primary case studies.)

1.1. Rail Transit and Transit-Oriented Development

This category integrates new fixed guideway transit systems, including new rail transit systems or new lines and capacity for additional travel demand that are integrated with land use and existing community resources in support of TOD. Fixed guideway transit projects designed around existing and planned centers, such as housing and jobs, establish a permanent anchor for complementary public and private infrastructure, and are particularly supportive of livability. Expanded public transit systems offer more choice to residents and workers in serving both commuting and nonwork social, recreational, and personal business mobility needs. Denver's FasTracks and the Maryland Department of Transportation's (MDOT) TOD offer examples of how a region or State can develop and promote plans for rail and transit investments while accommodating and marketing multi-use redevelopment.

Courtesy of RTD[3]

FasTracks is a comprehensive, multibillion-dollar transit expansion plan that includes new capacity for rail, including development of 122 miles of new commuter rail and light rail and 18 miles of bus rapid transit (BRT). FasTracks grew out of Denver's regional plan, Metro Vision, to better link its transit and rail improvements with land development. The rail and transit capacity improvements offer additional commuting choices and improved mobility, and balance transit needs with future regional growth. With the Denver area's population expected to grow to 4.2 million people by 2035, there was a need to expand transportation infrastructure to accommodate it.

The program development was led largely by the Regional Transportation District (RTD), but was based on a series of public-private partnerships (PPPs). The program integrates additional services, including expanded bus service (FastConnnects), redevelopment of Denver Union Station, and new park-and-rides. The station will be redeveloped into a multimodal transportation hub with potential for up to 2 million square feet of multi-use development. The integration of mixed-use redevelopment with capacity improvements supports the goal of a comprehensive transit and TOD approach for the Denver region.

FasTracks is also significant because of its balanced funding approach. The project team successfully

leveraged resources from a broad base of stakeholders, including a voter-approved sales tax increase of 0.4 percent—indicating widespread support for the program. Its multiple Federal, State, and local funding sources helped to build a group of stakeholders in support of the project. Projects like FasTracks will enhance connectivity in the Denver region and increase livability by offering a variety of commuter choices that will contribute to the long-term sustainability of the region.

MDOT's TOD initiative identified policy changes that facilitate and encourage TOD. MDOT, with support from municipalities, has been involved in planning, design, and implementation of TOD statewide. Its success has been attributed to joint ownership of the process and the commitment of municipalities. Through successful partnerships with municipalities, MDOT has facilitated multiple projects in support of integrated land use and transit planning. For instance, the State selected a master development team for the main State government complex in the heart of Baltimore. The team is assembling resources that can design, entitle, finance, and construct mixed-use, mixed-income, urban TOD to support surrounding neighborhood needs. MDOT's initiative to support TOD implementation has shown how a State DOT can take the lead role in land use and transit integration and be an active partner in land use development.

1.2. Corridor-Focused Bus Rapid Transit and Boulevard/Multiway

This category highlights multimodal streets that are designed to handle high levels of person-carrying capacity using a range of modes. Multiway boulevards manage both through and local traffic in the same right-of-way (ROW) with provision for BRT or enhanced bus, as well as TOD and pedestrian-scaled development. Effective multimodal planning can produce corridor and facility plans that simultaneously provide for BRT, improved vehicular operations, and pedestrian and bicycle facilities. **Palm Canyon Drive** and the **EmX Green Line** represent projects that have successfully utilized multimodal BRT and/or multiway boulevards to accommodate greater travel capacity while supporting development and growth along the corridors.

Oregon's EmX Green Line BRT[4] is constructed along a 4-mile stretch between two urban transportation hubs—Eugene, the second largest urban area in the State, and Springfield. Since 1996, the Lane Transit District (LTD) has been advocating for development of a BRT system. The EmX Green Line BRT became incorporated into the region's plans as a way to meet the State's transportation goals. The project cost about $25 million to build. Its funding sources were mostly Federal and included $13 million from FTA's New Starts program, which supports locally planned, implemented, and operated major transit capital investments. The project was one of the first BRT projects funded through New Starts.

The EmX Green Line BRT is designed to provide more ridership, convenient neighborhood connections, reliable service, and higher person-carrying capacity for the Franklin Corridor. Service began for the corridor in 2007. The project has cut the average travel time along the corridor and increased ridership by almost 50 percent. Development of the BRT lane in Eugene has successfully integrated increased transit capacity with improved connectivity to major transportation hubs in the region, offering more options to support travel demand.

Visualization was used extensively to develop an approach, create the chosen alternative, and communicate with the public. The community was actively involved in the design process through charrettes, workshops, and open houses. The system was designed to be built in stages to best meet funding availability and ridership demands. LTD embedded quality of life and other livability goals in the design approach, paying particular attention to the aesthetic of the buses, stations, and streetscape to enhance rider experience. The popularity of the line has led to plans for an additional line, the Gateway EmX Extension, which will connect Eugene and Springfield with the University of Oregon (UO) and commercial Gateway area.

In California, the city of Cathedral City improved capacity for Palm Canyon Drive, its main corridor, to better redevelop its historic downtown. The plan partly resulted from the California Department of Transportation's (Caltrans) interest in expanding the congested route from five to seven lanes. However, since this ran through the downtown—which included street-fronting historic homes—the city sought instead to design a multiway boulevard to improve the image of the area while addressing congestion. A quarter-mile segment of the current route was particularly dilapidated. The city sought to improve the corridor to accommodate growing traffic needs and draw businesses and residential investments back downtown. Developers also helped motivate the implementation of a boulevard.

Palm Canyon Drive Before and After

Source: Freedman Tung and Sasaki Urban Design, 2006.[5]

Palm Canyon was very project-oriented in its visioning approach, with a series of design charrettes guiding its development. The City Council established the Downtown Revitalization Steering Committee to guide the visioning process. The group sought out business and community input to develop a plan. The group ultimately decided on a design for a multiway boulevard, which allows through-traffic lanes to run parallel to separate local-traffic lanes that are accompanied by parking and sidewalks. This approach could better accommodate traffic and improve the appearance of the street. In addition, the multiway boulevard design offered better access to businesses and pedestrians along the corridor. The corridor was designed for future transit applicability as well, with potential for express bus lane service and bike lanes. The project demonstrates an effective implementation approach, moving from planning concepts into a funded programmed project.

1.3. Regional Transportation and Land Use Planning

MPOs are required to develop Metropolitan Transportation Plans (MTPs) every 4–5 years for at least a 20-year planning horizon. Many MPOs use different titles to refer to these required plans, such as long-range transportation plan (LRTP) or just long-range plan (throughout the guidebook, the planning documents are generally referred to by the name used by the agency sponsor, rather than consistent Federal Planning Rule terminology). In addition, MPOs and cities also conduct a variety of vision plans, regional transit plans, and plans that link land use planning with transportation planning. Regional transportation planning agencies and MPOs in **Charlotte, NC**; **Albany, NY**; and **Atlanta, GA**, have successfully used visioning and regional planning to integrate land use and transportation planning to support livability at the State, regional, and local levels.

Charlotte, NC Centers, Corridors, and Wedges Growth Framework

Source: Charlotte-Mecklenburg Planning, 2010.[6]

Charlotte's Integrated Land Use and Transit Plan offers examples of how to integrate land use and transportation planning to foster livability. The city's strategy of land development and transportation was fully integrated across the region and within the city government. From the 1970s to the 1990s, Charlotte experienced tremendous population growth as it rose to become one of the Nation's banking and financial centers. The city knew it needed a strategy to ensure this growth occurred in a way that enhanced the livability of the city and the greater Charlotte region.

The Centers, Corridors, and Wedges visioning effort was undertaken to map out how Charlotte should grow over time and understand what infrastructure investments would be needed to support this growth.

The Integrated Land Use and Transit Plan developed in 1998 built on the vision from the Centers, Corridors, and Wedges planning process. Over an intensive 9-month period, a series of transit/land use alternatives were tested for each of the five corridors identified in the CCW vision. An extensive public outreach process fostered community understanding and consensus around the recommended plan, which called for phased implementation of various transit technologies along the five corridors. Partnerships, such as those with the Charlotte Area Transit System (CATS) and other municipal government agencies, and initiatives, such as the South Corridor Infrastructure Program (SCIP), helped encourage ownership across departments. These efforts helped broaden the perspective of each department's role and involvement in integrated transportation and land use projects.

Charlotte's deliberate and forward-thinking visioning has led to development of multicorridor transit systems along the five corridors, including the South Corridor's Blue Line Light Rail Transit system. In support of its larger regional vision, the city set aside $50 million in investments for streets, sidewalks, and intersection improvements to support the Blue Line system through SCIP. The target investment is aimed at optimizing the TOD potential around each transit station. Charlotte also offers examples of successful implementation practices that demonstrate how to move from planning concepts into funded, programmed projects.

Source: Capital District Transportation Committee, 2007.[7]

Similar to Charlotte, **the Albany-Schenectady-Troy region MPO, the Capital District Transportation Committee (CDTC)**, developed the New Visions Plan, which included an extensive 3-year public involvement process. The New Visions Plan represents a regional, community-based approach to visioning. The plan functions as the region's long-range transportation plan, but is also used as a broad foundation for how transportation planning and project delivery should occur in the region. The plan is based on a broad set of community objectives, which allows for a stronger collaboration between transportation, land use, and other specialized areas of planning. In a region that is not experiencing significant growth yet is till spreading outwards, Albany's planners and elected officials have focused on planning proactively for the region's future. New Visions demonstrates a planning and process approach that uses scenarios for a limited-growth community.

In 2000, while the first New Visions was in effect, CDTC launched the Linkage program, which offers local assistance to carry out specific plans to reflect and implement the New Visions philosophy. Planning studies through the Linkage program have taken the form of corridor studies, transit feasibility studies, and small-area sector studies. The Linkage program is one of the keys to success of the visioning process because it emphasizes implementation through collaborative and coordinated planning. CDTC has funded more than 65 collaborative, jointly funded Linkage studies in support of transportation-land use coordination providing ongoing public comment on the New Visions goals, and facilitating the update processes that have occurred since their adoption.

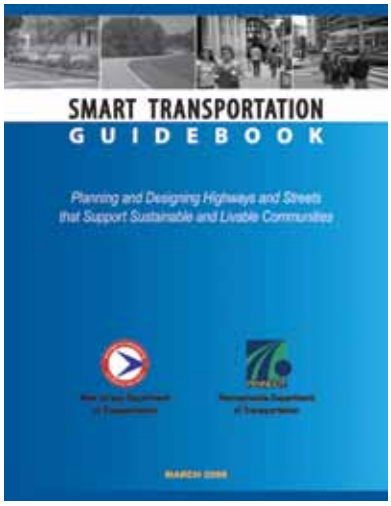
The Atlanta Regional Commission (ARC)[8] supports livability in design and implementation, incorporating lessons learned from projects into policies. Like many metropolitan regions, the Atlanta region is dealing with population growth and traffic congestion. ARC's member governments are making decisions about how to develop and grow in a sustainable way that will encourage livable communities. The **Atlanta Livable Centers Initiative (LCI)** was developed by ARC in 1999 and designed to encourage jurisdictions to more closely link transportation and land use decisions when determining development strategies. LCI

offers grants to local jurisdictions to study ways to implement strategies that support sustainable growth. One strength of the program is that ARC, like many MPOs, has extensive experience in partnering with localities to promote livability.

To date, LCI has resulted in more than 1,100 new and refurbished developments in 100-plus communities across the region. LCI offers a unique case study in terms of its multiple funding sources. ARC has reserved $1 million annually in 2000–2012 for LCI grants for studies. Grant recipient communities surveyed by ARC have adopted the LCI study into their comprehensive plans, designated special LCI zoning districts, and developed policies that will focus on housing for seniors and people with special needs. An additional $500 million has been allocated for transportation projects that result from LCI studies. LCI study grants have proven to be innovative ways to generate private investment to develop creative solutions in support of regional visioning that links land use and transportation.

1.4. Statewide Policy Approach

A statewide policy approach represents an effort by State government to institutionalize livability into decisionmaking through policy changes. The Pennsylvania Department of Transportation's (PennDOT) **Smart Transportation Guidebook and Implementation** offers a project-based vision approach, uses public involvement to support livability concepts, uses an ongoing planning process to develop new approaches, incorporates innovative project concepts into new plans, and supports livability in design and implementation. Pennsylvania has a unique statewide policy approach toward linking land use and transportation in support of livable communities. PennDOT successfully developed the guiding principles in its **Smart Transportation Guidebook and Implementation** to direct its resources for growth. The Guidebook was developed in partnership with NJDOT and the Delaware Valley Regional Planning Commission.



Source: Pennsylvania DOT, 2008.[9]

The flexible guidebook led to development of a forthcoming project delivery process that will link to livability. Under Governor Rendell's lead, an interagency group, including PennDOT, the Department of Environmental Protection (DEP), Department of Community and Economic Development (DCED), and several MPOs, has pursued State-level policy support for efficient growth matched with livability. Activities that led to the statewide policy approach include a series of conferences and interagency work groups convened to discuss a vision for the State, starting with the 2003 Conference on Land Use and Transportation for Economic Development.

Governor Rendell also reactivated an interagency land use team consisting of 23 agencies that had been created under a previous executive order. The group met over the course of 2 years to develop a vision and accompanying targeted investments for sound land use planning. PennDOT adopted the vision, which led to a new initiative called Smart Transportation. One main part of the initiative is to build projects based on existing resources, such as prioritizing traffic calming measures on a parkway to reduce noise rather than building a sound wall, which would also increase mobility for pedestrians and bicyclists.

1.5. Statewide Corridor Approach

A statewide corridor approach incorporates an initiative for a specific transportation corridor that often spans several regions across a State. It meets both local and interstate needs, such as statewide transportation goals linked to safety or mobility, or goods movement. The approach integrates roadway components that highlight multiways and networks, and can include higher capacity roads as a larger part of the network.

Gateway Route 1[10] represents a statewide corridor approach, led by the Maine Department of Transportation (MaineDOT). The project included an extensive scenario planning component to create a vision, using

Federal surface transportation funding for corridor planning. Gateway Route 1 also shows an effective public involvement process to promote livability and the benefits of multiple funding sources. Further, the project shows how to move from planning concepts into funded, programmed projects. The process involved a comprehensive approach to significantly change the dynamic between MaineDOT and the public across a 110-mile rural corridor. The memoranda of understanding (MOUs) that were created resulted in a formal implementation structure—a unique element of the partnerships that developed. While MaineDOT did not refer specifically to Gateway Route 1 as a CSS project, the project generally followed CSS principles.

Route 1, as a regional arterial and economic lifeline for the Midcoast Maine area, was reaching capacity as the population grew and development accelerated. While MaineDOT wanted to address the transportation issue through traditional widening of the arterial, Midcoast residents wanted a more collaborative approach that would focus planning along the corridor as a whole. MaineDOT worked together with Midcoast Maine residents in a collaborative corridor planning process that integrated community involvement with proactive land use and transportation planning. Partnership became an important element of the approach, leading to development of the official implementation organization, the Corridor Coalition.

In the first phase of the project, MaineDOT concentrated on establishing trust with the communities along the corridor to generate support during the planning process. In the second phase, an action plan of scenarios and strategies was developed that MaineDOT and the communities could use to achieve the goals of Gateway 1. The implementation phase is currently underway and MaineDOT is helping communities adopt the Gateway 1 plan into local plans and policies.

1.6. Rural Roadways

Rural roadways are found in between rural communities and in small towns where the main street is often a State highway. Measures such as traffic calming can be used to make such main streets more conducive to a livable community. A coalition was developed to do just that for a 20-mile stretch of Route 50 in Loudoun County, Virginia. The project is recognized as a leading example of context-sensitive design of a highway that also functions as a main street for rural villages. **Route 50** is very project-oriented in its vision-based approach. This effort demonstrates successful partnership approaches and illustrates how livability goals can be embedded in design.

Route 50 Corridor Coalition: Preserving the Past to Protect the Future

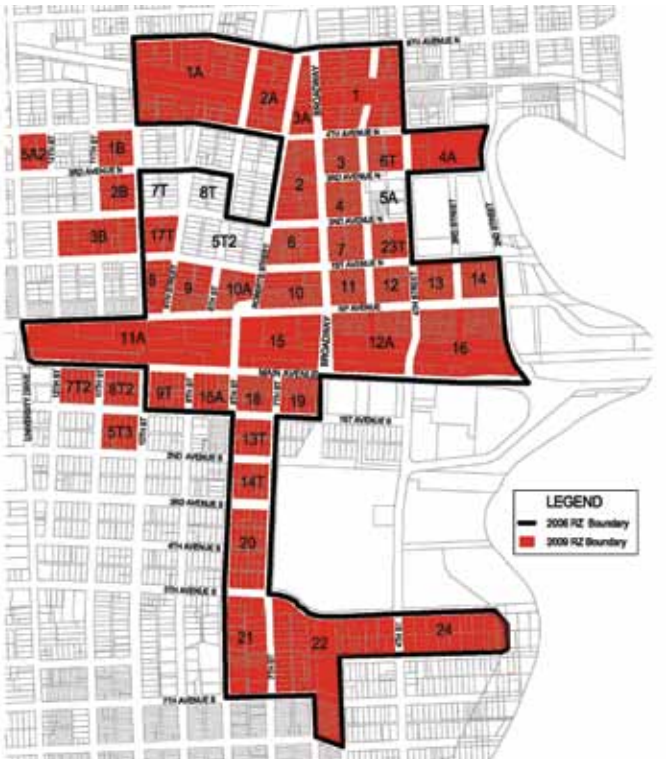
The project grew out of a coalition[11] comprised of local citizens concerned about a widening and bypass project scheduled for the portion of Route 50 that runs through Loudoun and Fauquier Counties. The coalition aimed to develop a corridor-wide vision for Route 50 that would consider a long-range view of transportation and land use, and provide alternatives to the State's widening and bypass solution for the route's traffic issues.

In 1995–1996, the coalition led community workshops that resulted in a final vision statement and community goal to move forward with traffic calming and roundabouts at key intersections. The goal of the traffic calming was not to impede traffic but to help self-enforce desired speeds and accommodate pedestrians, cyclists, and other nonmotorized users, while maintaining through traffic and rural character. The coalition's plan was adopted by the counties and its elements were subsequently incorporated into local comprehensive plans, representing another example of effective implementation.

1.7. Redevelopment

Redevelopment and brownfield projects often offer opportunities for inclusion of a transportation component. Incorporating transportation plans in brownfield and other infill redevelopment strengthens the link between land use and mobility. **Downtown Fargo, ND**, and **Chattanooga, TN's Riverfront Parkway** offer examples of cities that were able to revitalize downtown and attract businesses and housing through brownfield redevelopment.

2009 Renaissance Zone, Fargo, ND Map



Source: City of Fargo, 2009.[12]

The **Downtown Fargo Redevelopment Initiative** is a combination of multiple projects laid out in the City's redevelopment framework plan. Fargo's redevelopment, which grew out of this framework plan, demonstrates how to move from planning concepts into funded projects. Covering roughly 100 blocks, the Downtown Fargo initiative includes over $100 million in public and private investments in the area since 1999 to improve livability. The plan includes collaboration with neighboring Moorhead, MN, to maximize the potential for complimentary growth and to help identify strategic areas of growth for both cities. One major part of the redevelopment was the Renaissance Zone, a 39-block zone that has benefited from infill and adaptive reuse to expand housing and retail in the area. Fargo's success demonstrated that involving a mix of public and private sector funds can afford greater stakeholder buy-in and push a project along more quickly. As part of this, the city also completed a full streetscape reconstruction on Broadway, which supported this redevelopment through more pedestrian and bicycle facilities, and leveraged its partnership with North Dakota State University to support the redevelopment and transit operations.

For decades, **Chattanooga's Riverfront Parkway** provided a mobility corridor through the center of the city, primarily used for freight traffic. While this limited access highway responded to needs of the 1960s and 1970s, Chattanooga had changed as a community by 2000. An overall decline in industrial output and activity in the city had led to decreasing truck traffic volumes along Riverfront Parkway. In addition, several properties along the Parkway were beginning to redevelop into commercial uses and civic destinations, adding population and visitors to parts of central Chattanooga that had previously been occupied by industrial land uses. This shift in the city's economic geography meant that Riverfront Parkway was now the central spine of the city's waterfront, serving multiple visitor destinations and suggesting a need to reconsider the road's balance of access and mobility highway functions.

Chattanooga Riverfront Parkway

Source: Glatting Jackson Kercher Anglin Lopez Rinehart, Inc., 2001.[13]

1.8. Right-Sizing/Road Diet

Right-sizing, or road diets, refers to projects aimed at matching land use and transportation contexts appropriately on existing streets. Road diets can help with improving transportation choices, particularly for non-motorized travel, through increased pedestrian and biking facilities.

Hillsborough Street Roundabout

Source: City of Raleigh, 2007.[14]

The **Hillsborough Street Improvement Project** in Raleigh, NC, offers an example of a road diet that improves pedestrian access and vehicular safety. Hillsborough represents a very project-focused visioning approach. The Hillsborough Street Improvement Project focuses on improvements to the city's downtown that will improve pedestrian and vehicular safety along Hillsborough Street from Method Road to West Morgan Street. Among these improvements are rightsizing and implementing a road diet (reducing the number of lanes and adding a bike lane). Initial motivation for the project came from community residents who brought their project idea to the attention of City Council to gain funding and begin the project development process by creating a Municipal Service District along Hillsborough Street. Groundbreaking began on May 20, 2009, and is scheduled to be completed in September 2010. While the project was being developed, the surrounding community's focus for Hillsborough Street was directed toward transforming the area into a great street and public realm, enhancing the street's retail appeal, and improving vehicular and pedestrian safety.

1.9. Multimodal Bridges

Woodrow Wilson Bridge Project

An increasing number of new and rebuilt bridges are incorporating transit, pedestrian, and biking facilities. One such project is the **Woodrow Wilson Bridge**[15], a 12-lane bridge carrying traffic over the Potomac River between Maryland and Virginia. The bridge was originally a six-lane drawbridge, but traffic congestion and deteriorating structural conditions required planning for a bridge replacement. The bridge design involved MDOT, the Virginia Department of Transportation (VDOT), the City of Alexandria, Prince George's County, and FHWA. Despite years of controversy over the alternatives and lengthy NEPA and Section 404 permitting processes, the project delivered on community goals that supported livability efforts. The design improved the safety of the structure, accommodated additional projected traffic demand, included high-occupancy vehicle (HOV) lanes, and construction that would allow for potential future rail transit. It includes pedestrian and biking facilities, which allow bicycle commuters to travel between Alexandria and Prince George's County, major housing hubs in metro Washington, DC.

1.10. Transportation and Housing Affordability

True Affordability and Location Efficiency
H+T℠ Affordability Index

With the advent of the new livability principles, transportation agencies are paying greater attention to the connection between transportation and housing, particularly in terms of affordability. The Center for Neighborhood Technology's (CNT) **Housing + Transportation Affordability Index**[16] can inform decisionmakers about the true costs of development and transportation investments.

These projects address concerns related to affordability that occurs with TOD and increased density. CNT, along with the Center for Transit Oriented Development (CTOD), developed the Housing + Transportation Affordability Index in 2006. The project offers lessons on utilizing public involvement and partnership development to promote livability

as well as taking innovative project concepts and incorporating them into new plans. The first phase of the index analyzed characteristics from the St. Paul/Minneapolis, MN, area to incorporate transportation cost into overall housing and location affordability. Since 2006, the index has been expanded to analyze data from more than 330 metropolitan areas throughout the United States, making this a useful tool to local government and other planning decisionmakers when assessing community development goals.

The index considers neighborhood variables and location, as well as the transportation variables that play a role in determining the overall cost and affordability of a location. Variables examined in the index analysis include households per residential area, average block size in acres, transit connectivity index, job density, average time of journey to work, household income, household size, and workers per household. Based on these variables, the index creates maps of U.S. cities that display housing plus transportation costs for localities in the region.

Based on the findings from various city analyses, CNT has developed certain targets that can be used when implementing community development. They suggest considering housing and transportation together during neighborhood planning and encouraging redevelopment of inner city and older suburban neighborhoods. They also promote reducing the costs of commuting by car, preserving transportation choices within the community, and revisiting current policies and incentives to make them more responsive to current needs and trends in a given area. Greater focus on these policies combined with the realization that transportation plays a large role in location affordability will help local governments implement effective community planning strategies.

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2. Visioning

2.1. Introduction

Visioning tools and approaches are gaining more widespread acceptance in transportation planning and project implementation. Transportation practitioners have learned to work with housing, community development, environmental, and economic partners to address broader issues and develop more integrated long-term solutions. While the transportation industry has typically focused, by statute or regulation, on individual modal plans and short-term investment programs, linking transportation, land use, economy, and environment requires developing an integrated vision for growth over a much longer period. Where a typical MTP or LRTP is required to look ahead 20 years, and be fiscally constrained to limit projects to currently known available funding, a vision is by nature:

- *Forward-thinking.* Covering multiple generations, typically 50 years or more, a vision paints a compelling future, with follow-up planning figuring out how to get there.
- *Unconstrained.* Visioning encourages development of innovative solutions by decoupling creative brainstorming from the inherent limitations of individual agency mandates, planning requirements and timeframes, and budget constraints.
- *Comprehensive.* Community and regional visions, even when led by a transportation agency, typically look at options of how and where a community will grow, and then outline what kind of infrastructure improvements will best support that growth. A comprehensive vision takes into consideration the land use, environmental, social, economic, transportation, and other issues important to a community.
- *Flexible.* Visioning can be used at the beginning of a planning effort to generate ideas and interest, or used as a tool in the middle of a larger project (e.g., a neighborhood vision as follow-up to a regional scenario or corridor plan).
- *Inclusive and participatory.* Visioning is best conducted in well-advertised, hands-on participatory workshops, open to all, where participants work together to define issues and goals, and create consensus on long-term solutions.
- *Linked to action.* While unconstrained by business-as-usual assumptions, effective visioning is grounded in participants' local knowledge and often supported by scenario-based modeling of impacts and benefits. Coupled with broad participation, this approach helps a vision become reality through public and private investment over time.

Visioning approaches and outcomes can vary based on the scale of the area being studied, sponsoring partners' primary focus (e.g., regional growth or corridor planning), available funding, interest from other partners, and current issues that are importation to local stakeholders, communities, and decisionmakers (e.g., drought, economic downturn, tourism impacts, transportation congestion, etc.).

At the regional or statewide corridor level, visioning can be an elaborate, extended process, incorporating scenario planning and complex modeling to assess impacts and benefits of alternative futures. These large-scale planning efforts might utilize charrette planning—several days to a week with a collaborative, interdisciplinary design team developing potential solutions based on initial public input, regular feedback loops with interagency partners, and a final presentation to get public feedback on alternatives. Large-scale efforts typically involve the community, government, businesses, developers, and other stakeholders discussing multiple topics affecting an entire region (e.g., land use, transportation, housing, economy, education, health, environmental quality, climate change, and other regional concerns), and include a wide variety of stakeholder involvement. Regional scenario plans typically feed into MPO, State DOT, and transportation agencies' long range plans and project programming.

At the neighborhood or project scale, visioning can be a simpler process to address a specific transportation issue, support redevelopment, or coordinate transportation investments with ongoing growth. While an agency might be charged only with developing a neighborhood traffic calming plan, improving a road through a downtown or a single intersection, or supporting new TOD, an initial visioning session can help frame transportation solutions in light of broader issues—or even help identify additional partners and funding. A 2-hour public workshop to develop a neighborhood plan or intersection design might start with a 15-minute visioning brainstorm to frame overall issues, even if the resulting plan is focused entirely on transportation improvements. Similarly, the interactive public process techniques used in visioning can also be used throughout an overall planning process and project development to help ensure the community's original vision is reflected in what is funded and built—maintaining broad support that can help keep projects on schedule and on budget.

Vision-based approaches and interactive public involvement can help transportation agencies and their partners overcome a range of challenges, especially when used early in the planning process (see chapter 3 for planning and process examples). While community-based visioning can occasionally appear messy and complex, it can be an efficient and effective tool to get a broad range of people and partners focused on key issues at the same time so subsequent transportation projects solve the right problems. While just doing visioning does not ensure engagement (and some visioning projects have even been exclusive), ensuring effective vision-into-action does require a comprehensive, inclusive approach, and can:

- Enable a community or transportation agency to clearly define a problem, develop a clear understanding of potential future outcomes, outline a range of choices, and identify potential impacts and benefits.
- Encourage a context-sensitive, multimodal problem definition and solution process.
- Help involve additional stakeholders and ensure their input is included in developing solutions in a meaningful way.
- Incorporate non-transportation issues into development of integrated solutions, along with added project implementation capabilities and funding resources.
- Ensure ongoing public support and acceptance as transportation agencies develop vision concepts into specific policies, programs, and projects.

Public Involvement Best Practices: From Vision to Action

Effective collaborative process does not replace governance and good business with anarchy. In a well-designed process, the people "own" the process, the designers do their work, the developers or agencies "own" the projects, the elected decision-makers still make the tough decisions, and, most importantly, the vision gets built. A comprehensive approach relies on:

- Getting people to the table—all-out public relations and partnerships:
  - Interagency teams, cross-program coordination
  - Work through community contacts, project steering committee
- Preparation and training
  - Facilitator and staff training, community education
  - RoadWork and Walking Audits
  - Science/data/designs translated and presented clearly
- Well-designed process—issues-oriented focus groups, individual exercises, and hands-on public workshops
  - Small groups, marking on maps, place-based
  - "Open architecture" process—clear directions and rules explained to all
- Comprehensive, exciting visual plans with innovative designs and local examples; cost-effective and buildable
- Action Agenda to get buy-in and determine priorities
- Funding and implementation of model projects

From "Public Involvement Best Practices" by Harrison Rue, Terrain.Org, 2005

Source: **http://www.terrain.org/articles/17/rue.htm**

The hallmark of an effective visioning process is efficiency. While many community design workshops require an all-day or Saturday event, public involvement work on transportation projects can often be accomplished in a series of well-organized 2-hour workshops. Large group discussions are good for initially laying issues on the table, taking questions, and explaining details of a plan being presented at a later workshop. The simplest kickoff visioning tool, "post-it visions," starts with individual input and leads to a summary of what members of a group have in common, all in about 10 or 15 minutes. Each person is given three to five post-it notes and a few minutes to write down five phrases that describe their long-term vision for the community. The notes are then sorted onto a nearby wall into topics that invariably demonstrate how much the group already holds in common (with a volunteer summarizing points of consensus later in the workshop). Another way to prioritize issues before breaking into small groups is listing all the problem areas and potential solutions (using big pieces of paper and big print), then posting those lists on the wall for a "dot vote" (each person gets three to five dots)—which again demonstrates clear group preferences and priority issues.

Most creative place-based visioning work happens in small groups around tables, typically using markers on large area maps or group workbooks. Short one-on-one conversations are a good tool to start a productive dialogue. The audience is asked to divide into pairs; each person shares a key issue with his/her partner and reports the other's idea back to the group. Good process also makes effective use of technology, using well-organized PowerPoint presentations to lay the groundwork, define options, and present images of potential solutions. When funding allows, scenario-planning models can help evaluate and compare alternatives for presentation at a later workshop.

2.2. Case Studies

The following case studies illustrate the different ways that vision-based approaches can be used to address transportation problems. Gateway Route 1 is a major State road corridor-level initiative, initiated by the State DOT. CDTC's New Visions is a regional MPO-based vision. U.S. Route 50 shows vision-based approaches on a rural road corridor, catalyzed by the community. Eugene's EmX applies visioning to a transit corridor.

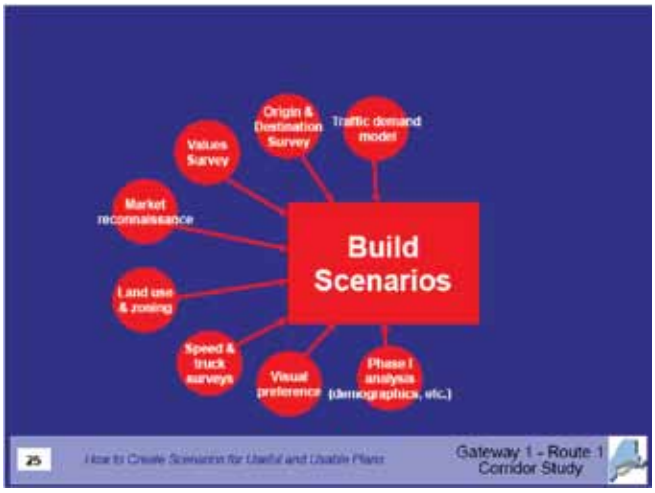
Gateway Route 1

The Gateway Route 1 initiative is an example of a larger scaled, corridor-based visioning initiative, spanning 110 miles across a segment of Maine's rural Midcoast. Led by MaineDOT, the vision created by the Gateway Route 1 Steering Committee aligns multiple interconnecting livability issues (e.g., land use, transportation, environment, economy) into a cohesive development and investment strategy embraced by the State and localities through their respective policies.

Overcoming Challenges

The Gateway Route 1 initiative's goals were to preserve the integrity of Route 1 in the State highway system, enhance safety, and provide transportation choices, while addressing development and quality of life. To meet all these goals, MaineDOT decided to develop a scenario-based vision for the region's future to coordinate varying needs, objectives, and visions of diverse communities along the corridor. The two-step scenario process helped articulate and synthesize a vision across each of the 20 communities. An extensive community outreach process, with more than 50 community and larger regional meetings, led to extraordinary cooperation between the communities and the State (see chapter 3).

MaineDOT: How to Create Scenarios for Useful and Usable Plans



Source: MaineDOT, 2009.[17]

Using community input and data from current conditions, the Gateway 1 study team developed a variety of growth scenarios. These scenarios show how various development intensities and patterns can influence the corridor's transportation needs, and how changes to Route 1 and other transportation facilities can affect land use patterns. From these options, the community-based Steering Committee identified "Riding the Current" as the most likely future business-as-usual scenario, or what would be likely to happen with no coordinated framework. This approach was then used as the basis for the second phase of scenario assessment; this second set of scenarios outlined a range of potential future growth scenarios for further outreach and input.

Full Wind

- Aging population, with continued in-migration of middle-aged, elderly, and early retirees; deaths exceed births
- In-migration of more affluent and educated from out-of-state
- Young workforce moves inland
- More federal transportation dollars to fund improvements on interstates and major arterials
- Safety and capacity issues continue to arise with accelerated economic growth
- Population grows at twice the projected rate
- Large tract subdivisions inland provide needed housing
- Route 1 more "stripped-out"—doubled in 20 years—limiting the effectiveness of flexible design standards
- Strong presence of new R&D opportunities, shellfish aquaculture thrives

Riding the Current

- Aging population, with continued in-migration of middle-aged, elderly, and early retirees; deaths exceed births
- In-migration of more affluent and educated from out-of-state sustains growth
- Displacement of Mid-Coast locals to inland
- Fewer federal transportation dollars result in consideration of tolls on interstates and major arterials. Tolls are more commonly used to fund needed transportation infrastructure improvements
- Route 1 more "stripped-out"—mostly in transition areas, but also expanding to rural roads
- Quality of life generally maintained, but Route 1 residents continue to experience increase in truck traffic, noise, safety, and air quality issues
- Ground fishing does not recover, with strict limits on fishing days and/or new individual quota system; lobster fishery declines from peak but still above long-term average
- Strong presence of new R&D opportunities due to influx of affluent, even with reductions in Federal R&D dollars
- Primary constraints to regional economic growth are unaffordability of housing for working families and transportation disadvantage for ports, rail, and over-the-road shipments
- Global warming trends continue and many coastal areas threatened by flooding

Perfect Storm

- Long-standing industries decline
- Slowed in-migration of middle-aged-elderly and early retirees.
- High property values force work force inland
- Tourism remains strong
- Fewer federal transportation dollars result in limited roadway and rail infrastructure improvements
- Route 1 more "stripped-out"—strong competition among communities for retail and commercial business also limits effectiveness for flexible design standards
- Quality of life generally maintained, but Route 1 residents continue to experience increases in congestion , truck traffic, noise, safety, and air quality issues
- Increased presence of new R&D opportunities due to state investment, but limited benefit to region

Source: MaineDOT, 2009.[18]

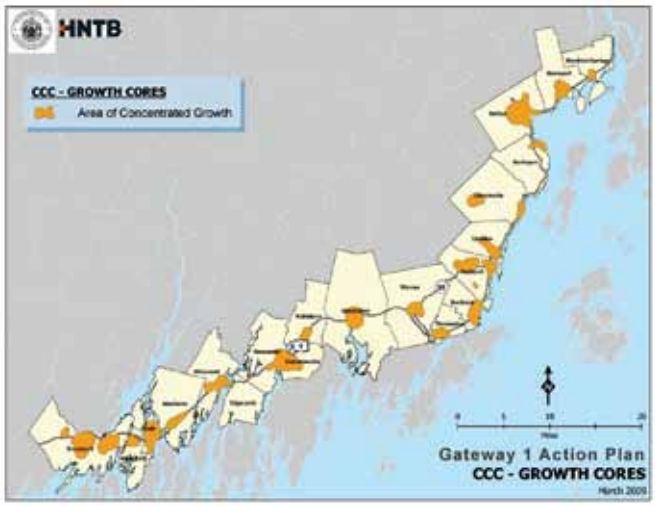
As part of the second scenario exercise, the Steering Committee tried to address community concerns comprehensively by evaluating alternative patterns of development based on the following performance measures:

- *Mobility* – Vehicle-miles traveled (VMT), change in local road traffic, level of service (LOS).
- *Accessibility* – Transit ridership, walkability, bikeability.
- *Jobs-Housing Balance* – Accessibility to jobs, accessibility to retail, emergency medical response, housing in core growth areas, jobs in core growth areas.
- *Rural Lands and Habitat* – Acres conserved, habitat impacts.
- *Community Character* – Viewshed impact, commercial strip impacts.

The alternative scenarios included:

- *Low-Density Pattern, but with Special Attention to Preserving Rural Character* – This pattern accepts the continued spreading out of residential and commercial development, but relies on performance standards to manage access to Routes 1 and 90, and on design standards to help preserve the scenic character of these arterials.
- *New England Village Pattern* – This pattern embodies the small downtown with surrounding compact residential neighborhoods that were characteristic of the corridor's development pattern through the mid-20th century.
- *Micropolitan Pattern* – This pattern consciously grows three urbanized centers in the Midcoast Corridor into larger and more dominant "micropolitan" areas.
- *Transit-Oriented Corridor Pattern* – This pattern borrows from the New England Village and Micropolitan patterns. It creates groups of compact residential, commercial, and mixed-use core growth areas centered on a variety of transportation opportunities—ride-sharing, transit, multimodal freight, passenger rail where available, walking, and bicycling.

Map of CCC—Growth Cores



Source: MaineDOT, 2009.[19]

Outcomes and Results

The Steering Committee chose to go with a hybrid approach called the Community-Centered Corridor (CCC). This approach blends the Transit-Oriented Corridor pattern's more compact development with a more likely and politically feasible low-density pattern. CCC has the same "necklace of pearls" pattern as the Transit-Oriented Corridor, formed by a series of compact core growth areas along the corridor.

The Gateway 1 initiative developed an action plan geared toward implementation of the selected preferred option. As of February 2010, 16 of the 21 towns have signed a startup agreement to support the action plan formally and appoint the Implementation Steering Committee that will help shape the Corridor Coalition, the decisionmaking group for local and regional transportation project prioritization. The action plan covers State and local commitments on the following topics: preserve and increase mobility and safety, create jobs-housing balance, support alternative passenger and freight modes, conserve rural and wildlife habitat, and preserve visual and community character.

Lessons Learned

- ***Building a vision requires agreement on problems, solutions, and follow-through.*** In Gateway 1's case, the vision is the basis for all subsequent actions by the Gateway 1 Corridor Coalition (the new name of the Steering Committee). MOUs have been critical to the initiative's success by outlining the "rules of the game" and responsibilities and commitments at the local and State levels (see Chapter 5). The vision encompasses multiple livability issues, including safety and mobility, jobs-housing balance, alternative transportation modes and freight, visual and community character, and rural lands and wildlife preservation. Using a corridor-based visioning approach, combined with the new Gateway 1 Corridor Coalition structure, has demonstrated the effectiveness of new tools and forged a new relationship between MaineDOT and the communities.
- ***Visioning is inspirational and educational, and requires trust.*** MaineDOT and its partners spent much effort and time creating the scenarios and educating communities on technical elements, such as growth assumptions, origin and destination information, truck surveys, and other data. MaineDOT stopped when the public said so—essentially, the public defined the scope, schedule, and process. This time and effort helped create the trust that underpinned the ongoing collaboration, and encouraged commitment of each municipality and partner agency to work together throughout the planning process. The initial phase "focused almost exclusively on trust building with the communities, and developing a collaborative framework for the corridor vision, plan, and implementation."[4]
- ***Visioning is more effective when it incorporates land use and transportation.*** The Gateway 1 initiative shows that visioning can lead to implementation. While transportation agencies do not directly control land use, and most localities do not control State highway projects, a shared vision can help guide and coordinate individual agency and locality decisions. Even in a strong home-rule State such as Maine, a collaborative visioning process can be the basis for successfully implementing integrated land use and transportation policies.

Albany CDTC New Visions Plan

Vision-based approaches can also be applied at the MPO level. Although the Albany, NY, area is not experiencing significant growth, planners and elected officials have planned proactively for its future, including supporting land use planning and encouraging smart growth. In the 1990s, CDTC, the MPO for the Albany-Troy-Schenectady, NY, region, was very interested in developing an LRTP that was responsive to opportunities presented by the ISTEA legislation. An extensive, 3-year public participation process led CDTC to develop a broader set of holistic planning and investment principles, and to emphasize a range of modes and community needs in project definition and programming. The plan has enjoyed popular support through several updates, with the latest update developing the concept of a "quality region" that strongly supports urban reinvestment and smart growth. "Quality of Life" at the regional and community level is emphasized, and the Plan calls for protecting urban, suburban, and rural character.

Overcoming Challenges

The New Visions Plan (originally adopted in 1997) was created through a 3-year public involvement process intended to articulate a vision for the region's future. While New Visions functions as the region's LRTP, it also used the goals and desires identified in the vision statement to establish a philosophy for how transportation planning and project delivery should occur in the region. New Visions explored a broad range of topics, involving local governments, interest groups, and private organizations from throughout the region. CDTC's approach to public involvement opened the conventional scope of the LRTP to a broader range of community issues, such as environmental protection, preservation of established neighborhoods and downtowns,

[4] Transportation Research Board, NCHRP Project 8-36, Task 86 Final Report, Corridor Approaches to Integrated Transportation and Land Use. (June 2009). Requested by: American Association of State Highway and Transportation Officials Standing Committee on Planning. Prepared by ICF International. Accessed 02/03/2010. Available at **http://pubsindex.trb.org/view.aspx?id=910506.**

and elected officials' desire to limit expansion of the region's urbanized areas more in line with its relatively modest population growth. The approach represented a significant effort to capture community desires as thoroughly as possible.

New Visions is centered on 31 principles, grouped into four categories:

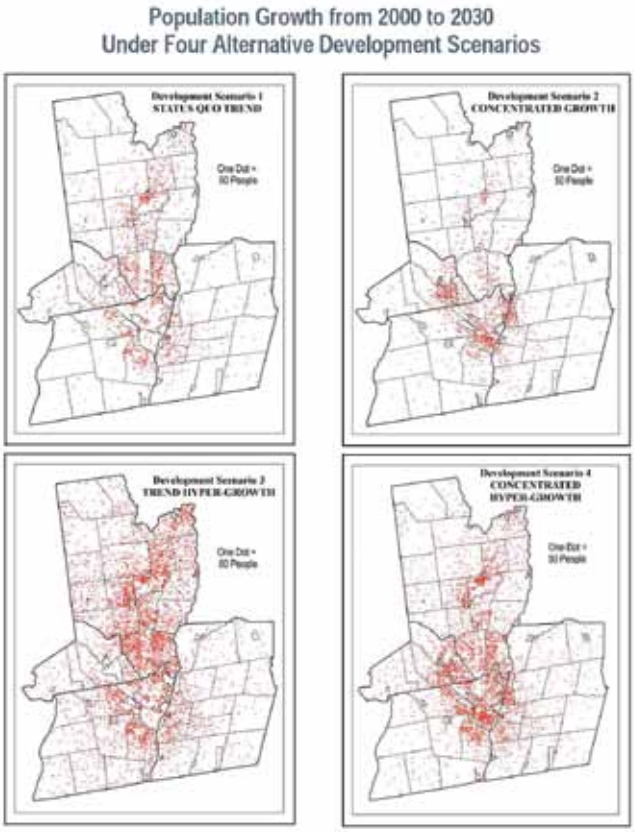
- Plan and build for all modes of transportation, including pedestrian, bicycle, public transit, and cars and trucks.
- Preserve and manage the existing investment in the region's transportation system.
- Develop the region's potential to grow into a uniquely attractive, vibrant, and diverse metropolitan area.
- Link transportation and land use planning to meet the LRTP's goals for urban investment, concentrated development patterns, and smart economic growth.

From these principles, both strategies and actions were identified and implemented through the Transportation Improvement Program (TIP) and Unified Planning Work Program (UPWP) for regional-level activities, and through the Linkage Program for local and land use activities.

The MPO staff understood that it was not feasible to undergo equally extensive processes for every 4-year-plan update period, nor was it necessary. The New Visions philosophy provided a guiding framework for LRTP updates. Subsequent updates (2001, 2004, and 2007) have not employed the same level of public involvement, instead using stakeholder groups and task forces to provide recommendations on target areas.

The current LRTP and fourth update in 2007, New Visions 2030, focused on regional transportation and land use connections. It also introduced scenarios to understand potential future transportation outcomes of current land use and community planning decisions. It evaluated four growth scenarios: two scenarios using a trend-based population growth rate, one with compact growth throughout the region and the other a more dispersed, land-intensive pattern; and two scenarios with a high growth rate (one with dispersed development, one with concentrated development). CDTC staff used the regional travel demand model to forecast traffic patterns and summarize likely transportation investment needs for each scenario. The plan strongly supports concentrated growth patterns. CDTC finds that the scenario forecasting approach allows a better understanding of the issues and choices confronting the region and allows greater focus on creating flexibility and reliability in the system. This has resulted in a sustainable approach that meets current needs and preserves options for future decisionmakers.

Sample Population Growth Analysis



Source: Capital District Transportation Committee, 2007.[20]

Outcomes and Results

Since the first New Visions plan, many related projects have been completed through the Linkage Program—a direct technical assistance program explored more in chapter 3—such as funding (more than $3 million) for 65 joint planning studies in 38 municipalities since 2000.

Lessons Learned

- *Vision-based approaches can build on each other, even in the same region.* CDTC did not go into the same level of detail on the updates, but rather refined and expanded on previous work. It is looking for ways to test, reinforce, and support that vision with each update. The outcome has been that the vision statement has changed little, reflecting a regional planning paradigm in tune with the needs and expectations of the region. As CDTC states, "It is not a 'shelf plan' in any respect, but has had great staying power—all 31 of the adopted principles were re-adopted in 2001, again in 2004 and are still valid today." Furthermore, CDTC's Linkage Program is an additional mechanism to consistently validate that vision through its public involvement processes and Linkage Forum.
- *Making sure the project choice process matches the vision.* Many MPOs have difficulty ensuring that identified projects truly respond to community needs. By going beyond simply representing constituent communities in project programming, matching the vision means truly identifying projects that support community goals. In its LRTP and TIP selection process, CDTC gives a higher priority to projects that have come from Linkage studies, recognizing their demonstration of New Visions principles. This makes the goals, objectives, and principles of the LRTP and TIP very relevant to those at the local level.

Route 50, Loudoun County, VA

This project is an example of a corridor visioning process that led to successful implementation of intersection enhancements and traffic calming measures on a rural State highway. In 1994, VDOT announced a proposal to study transportation issues on Route 50 in Loudoun and Fauquier Counties, and the potential for building a bypass around the towns of Middleburg and Aldie. Reacting to this, the Route 50 Corridor Coalition was formed as a partnership of five local nonprofit groups. The coalition's main goals were to develop a corridor-wide vision for Route 50 that incorporated a long-range view of transportation and land use, and provided alternatives to the widening and bypass proposal. This example demonstrates the importance of meaningful public input in transportation decisionmaking, particularly at the outset. Initial and ongoing community involvement is invaluable in streamlining the project development process and aligning transportation decisions to community goals.

CASE STUDY HIGHLIGHT

FasTracks and MetroVision—Implementing the Vision

FasTracks stemmed from the regional vision put forth by Metro Vision, the Denver Regional Council of Government's strategy for future growth. It is the product of an extensive mobilization effort involving communities and area leaders to develop a comprehensive public transit system. The Denver region united around a common vision for the future, characterized by compact, mixed-use developments that are bike-, pedestrian-, and transit-friendly, with more affordable housing along a regional transit system. Metro Vision is an unprecedented opportunity to move projects forward that promote transit-friendly, transit-efficient development. FasTracks effectively linked land use and transportation planning through its transit, rail, and land use development improvement effort. Visioning for FasTracks was a collaborative effort, led by a coalition of local officials, business leaders, and environmentalists called the Transit Alliance. The alliance's multiyear outreach campaign built public support and allowed for input. FasTracks is also one of the tangible results of DRCOG's TOD program, created in 2006 to provide TOD-related information assisting policymakers, business leaders, and the public. Program activities include a Web site with extensive resources on TOD, a Planner Idea Exchange with regular meetings for planning staff, and a TOD best practices workshop series.

Overcoming Challenges

In 1995–1996, the Route 50 Corridor Coalition initiated community workshops resulting in a final vision statement and community goal to move forward with a traffic calming plan. The effort proved successful,

as volunteers offered assistance with the effort and significant numbers of attendees participated in the visioning and planning workshops. In 1996, a traffic calming plan was completed for the towns of Aldie, Middleburg, and Upperville to create a scenic, unique, rural community in a historical, agricultural, and natural setting. The plan and vision were guided by the following goals and objectives:

- Goals: increase quality of life, improve conditions for pedestrians, incorporate the preference and requirement for people using the streets and intersections, create safe and attractive streets, and reduce the negative effects of automobiles on the environment.
- Objectives: slow traffic within the posted speed limits; reduce collision frequency and severity; improve the perception and reality of safety for nonmotorized users of the streets; reduce the need for police enforcement; provide more greenery; enhance the historical, agriculture, and natural setting; increase access to main street land uses for pedestrians and car users; and accommodate but not invite through-traffic.

Drive Through History

Source: Fauqiuer and Loudoun Counties, Virginia, 2003.[21]

In 2000, a second round of planning and design began, with VDOT and the Route 50 Corridor Coalition working together in the Route 50 Traffic Calming Task Force. The task force is responsible for the traffic calming plan's implementation as it goes through project development, final design, and construction.

Outcomes and Results

The traffic calming plan was adopted by the Middleburg Town Council and the Loudoun and Fauquier County Board of Supervisors in 1997, and in that same year was recognized by the Institute of Transportation Engineers (ITE) President's Award for Excellence. In 1998, the Route 50 traffic calming project won congressional funding as a demonstration project under TEA-21. Detailed design and engineering followed. In 2007, construction began, and various elements of the project are still underway. Through anecdotal accounts, the new roadway design has significantly altered the behavior of drivers in the Upperville and Gilberts Corner area. Fewer traffic backups are also observed at the new roundabouts at Gilberts Corner compared to the previous signalized conditions. VDOT plans to conduct more formal studies to measure the effect of the traffic calming measures along the corridor.

Lessons Learned

Vision-based approaches can be started by anyone in a community. Route 50's success story is remarkable for bringing various community members together to agree on and support one common corridor vision, and to get it implemented. This grassroots-led traffic calming project was able to energize community and municipal leaders, and later received dedicated Federal funding to be the first State traffic calming project for a rural highway.

A committed and engaged community can be a laboratory for State innovations. Although the initial controversy and tension between VDOT and the community proved to be a challenge for a collaborative work process at the outset, a number of the department's engineers developed good relationships with the community leadership during the design development process. The project provided valuable lessons for VDOT staff and the consulting team related to community visioning and innovative traffic calming approaches.

EmX Green Line BRT

The EmX Green Line BRT project shows how a community and agency's specific project vision can be addressed to best meet anticipated travel demand. In the 1990s, LTD sought to upgrade its transit infrastructure and service. At the same time, the community, through its regional transportation planning process, was exploring ways to address its larger transportation needs. Identified in the regional LRTP for the region, the EmX Green Line BRT is the first phase in a region-wide BRT network, spanning 61 miles, addressing desires for increased service and response to growth.

Overcoming Challenges

As with many transportation projects, cost was a concern. LTD evaluated different options, but light rail was too expensive. Instead, LTD found inspiration from BRT in Curitiba, Brazil—and this transit option became its long-term strategy. LTD sought to design a phased system of bus corridors, built to match funding and ridership demand in a cost-effective manner.

During the corridor visioning process, LTD made an effort to meet with every owner and/or occupant along the corridor to discuss the concept, inform them of any potential impacts, and encourage feedback. Several design charrettes were also held, during which attendees were asked to provide input on the design of the system, as well as open houses where LTD provided information about system elements and implementation. These public workshops, open houses, and public hearings were supplemented by working groups of elected officials and stakeholders.[5] One crucial element of this visioning was the actual visualization used. BRT is a fairly new transportation technology and showing the community what the actual design looked like was very important. LTD facilities staff created a full-size mockup of the chosen vehicle to show to community members, particularly those using wheelchairs and bicycles.

Public Outreach and Community Meetings

Photo credit: Lane Transit District. Source: Federal Transit Administration, 2009.[22]

[5] Thole, Cheryl, Alasdair Cain, and Jennifer Flynn. *The EmX Franklin Corridor—BRT Project Evaluation*. Federal Transit Administration. April 2009.

Photo-Visualization of Possible BRT Alignments

Source: Newlands & Company, 1999.[23]

Outcomes and Results

Since replacing the regular bus routes, ridership has jumped by almost 50 percent, with daily boardings of 5,400 in April 2008. LTD is already planning its second EmX corridor, the Pioneer Parkway line, an extension from the Springfield station. Community members already see that EmX is helping economic development and acting as a community building block.

Lessons Learned

Visualization maintains the vision. Visualization was key to gaining community support and keeping employees engaged. The public, particularly community groups and the business community, appreciated that LTD involved them in development of the Franklin line, especially since the operating funds were derived through local business payroll taxes. The visualization helped to keep stakeholders at the table and invested in the project's success.

CASE STUDY HIGHLIGHT

Great Streets—City-Wide Initiatives to Apply Visioning to Specific Corridors

Both St. Louis, MO, and Washington, DC, have launched city-wide corridor- and community- based visioning to create livable communities. In 2006, St. Louis's Council of Governments, East-West Greenway, launched the St. Louis Great Streets Initiative to transform residents' vision of the city's streets into attractive places that support multimodal efforts, business development, and community engagement. The initiative is working to improve the quality of life in local communities through a series of tutorial workshops using East-West Greenway's tool, the Digital Design Guide. The guide helps inspire community visions by identifying how to integrate practical solutions into streets using five principal elements of streets: street wall, pedestrian realm, overhead area, vehicle realm, and subsurface area. The tool focuses on answering the question, "What makes a street great?" Through this project, East-West Greenway facilitates greater awareness from residents and local planners as to how transportation-related decisions affect a city's overall built environment.

The Washington, DC, District Department of Transportation's (DDOT) Great Streets Program is a partnership between DDOT, the Office of the Deputy Mayor for Planning and Economic Development (ODMPED), Office of Planning (OP), Department of Parks and Recreation (DPR), and Neighborhood Service Coordinators (NSC), as well as others. The program focuses on transforming nine major corridors, all selected for the lack of previous investment, into "places where people want to be." DDOT used extensive public outreach efforts—particularly with property owners along the corridors and potential developers and/or investors—to facilitate stakeholder involvement in the decisionmaking process. One of the valuable outcomes of this process was establishing a project identity and collaboration between affected entities.

2.3. Conclusion

The case studies illustrate how long-range visioning promotes livability principles by removing barriers to effective collaboration. Each one exemplifies how a vision is forward-thinking, unconstrained, comprehensive, flexible, inclusive, participatory, and linked to action. The differences include the scale of the vision and its study area, the lead organization, the primary focus, and the funding mechanisms.

- ***Visioning helps develop a clear understanding of potential future outcomes, outline a range of choices, and identify potential impacts and benefits.*** In each case, the vision creates a foundation for informed, community-based decisionmaking. In Gateway Route 1, the Steering Committee was able to agree on the transportation problems facing its region, assessed two separate scenarios (one on current trends and one on a desired future), and evaluated these scenarios based on a community-based set of performance measures. The New Visions process has continuously been supporting an evolving vision for the region since 1997—even testing the vision through subcommittee evaluations on regionally important issues. In the Route 50 example, the vision enabled the community to articulate its desired transportation improvements to VDOT and FHWA.
- ***Visioning supports context-sensitive, multimodal problem definitions and solutions, and ensures stakeholder input is included in a meaningful way.*** Vision-based approaches can help stakeholders evaluate both the quantitative data and subjective qualitative elements that affect the community and its quality of life. Fundamentally, they provide a forum to have a deliberative and inclusive decisionmaking process to find the right choice for that place. In EmX, this process meant that BRT, rather than light rail or road expansion, was the appropriate transit choice. Collaborating on the vision brought several community groups together around a central concern on Route 50 and the preservation of the natural, agricultural, and historical setting in those communities.
- ***Visioning incorporates non-transportation issues into development solutions aligned with livability.*** In Gateway 1, the visioning approach addressed land use, wildlife habitat, and community character. New Visions covers a multitude of regional issues, such as equitable treatment, older Americans and aging, and other environmental issues. Route 50 focused on the historical elements, community character, and pedestrian and bicycling mobility. One concern with EmX was the economic impacts of the project and expected economic development resulting from it—local business owners were very invested, as they were helping to fund the operating expenses.

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3. Planning and Process

3.1. Introduction

Today's economic, environmental, and social conditions have created a different set of transportation system demands compared to 40–50 years ago, when most MPO and State transportation planning processes were established. This changing context requires a different set of planning processes. Established project development processes and organizational structures that worked well in the past may prove limiting for transportation projects to achieve today's livability goals. State, regional, and local agencies have moved beyond established procedures to better address common transportation challenges. They have changed project delivery processes, including using alternative performance measures, outreach methods, and implementation strategies so that transportation projects can improve community livability. Other communities have achieved livability goals working within existing project planning and delivery structures.

- *Innovative, participatory planning processes can more effectively reach the right stakeholders and capture real input.* Controversy occurs when transportation agencies go through lengthy project development processes but fail to truly capture the community's input. When conflict occurs at a late stage (during final design or construction) it can impact project costs and schedule.
- *Incorporating livability goals into the planning process can help define a transportation need or problem prior to developing solutions.* Transportation agencies are often faced with situations where projects have been advanced to a late stage before stakeholders agree to what the problem at hand is, or that there is a problem to begin with. When conventional processes including forecast models, performance measures, and design standards are geared just toward adding capacity, roadway building and widening projects are the obvious solution. A participatory process early in planning can uncover other important issues, and better define purpose and need to solve complex problems.
- *Rethinking the planning process facilitates partnerships necessary to effectively implement a project.* Transportation infrastructure crosses jurisdictional lines, so integrated planning requires working across municipal boundaries. Planning that integrates transportation, land use, affordable housing, and environment requires an interagency process to uncover shared issues and "big picture" solutions.
- *Collaborative design processes can help develop creative, integrated plans.* Building interdisciplinary project teams of planning, engineering, and design staff or consultants, and working together to develop and test concept plans, is a proven approach to integrating transportation with land use and development.

- *Changes in process have helped align fiscal realities with the true costs of transportation projects.* Fiscal constraints are causing planners to rethink how transportation needs can be addressed. Transportation departments can no longer afford to spend resources planning or building projects that are not likely to be feasible due to budget constraints, cost overruns, or potential costly litigation due to mismatched project designs and stakeholder expectations.

3.2. Case Studies

Charlotte Integrated Land Use and Transit Planning

Although Federal policies and guidelines require integration of community goals with transit projects, many communities find this a challenging task. The City of Charlotte has successfully embraced integrated land use and transit planning, producing high transit ridership while accomplishing various livability goals. The city followed required Federal and State processes, and introduced unique local and regional planning and regulatory mechanisms. Charlotte began with a comprehensive regional growth vision, an aggressive policy and infrastructure response to this vision, and an organizational structure of city departments that encourages a broad-based livability focus.

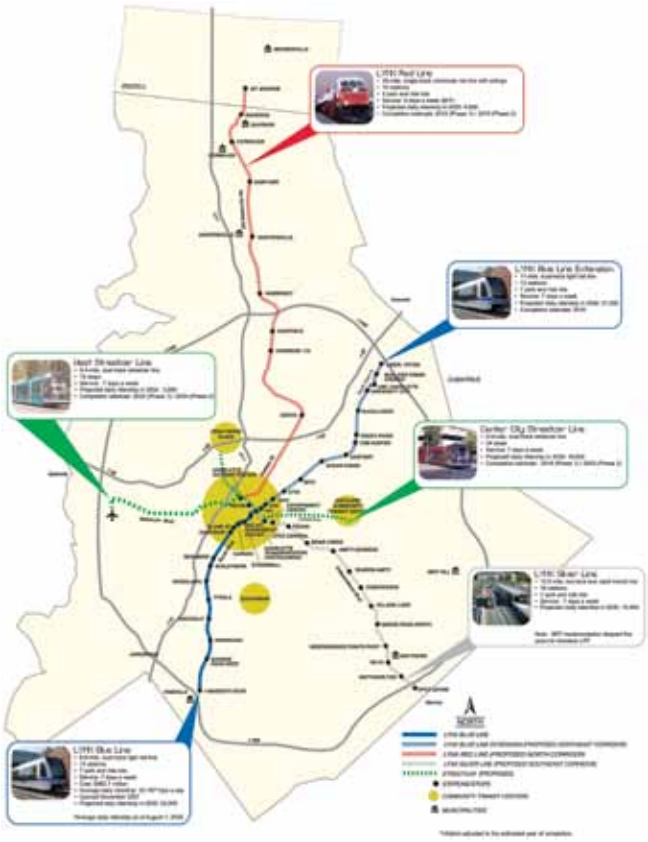
Overcoming the Challenge

Centers, Corridors, and Wedges Plan

Illustration of a long-term growth framework for the five primary transportation and development corridors in the Charlotte area.

Source: Charlotte-Mecklenburg Planning, 2009.[24]

LYNX and Streetcar System Map



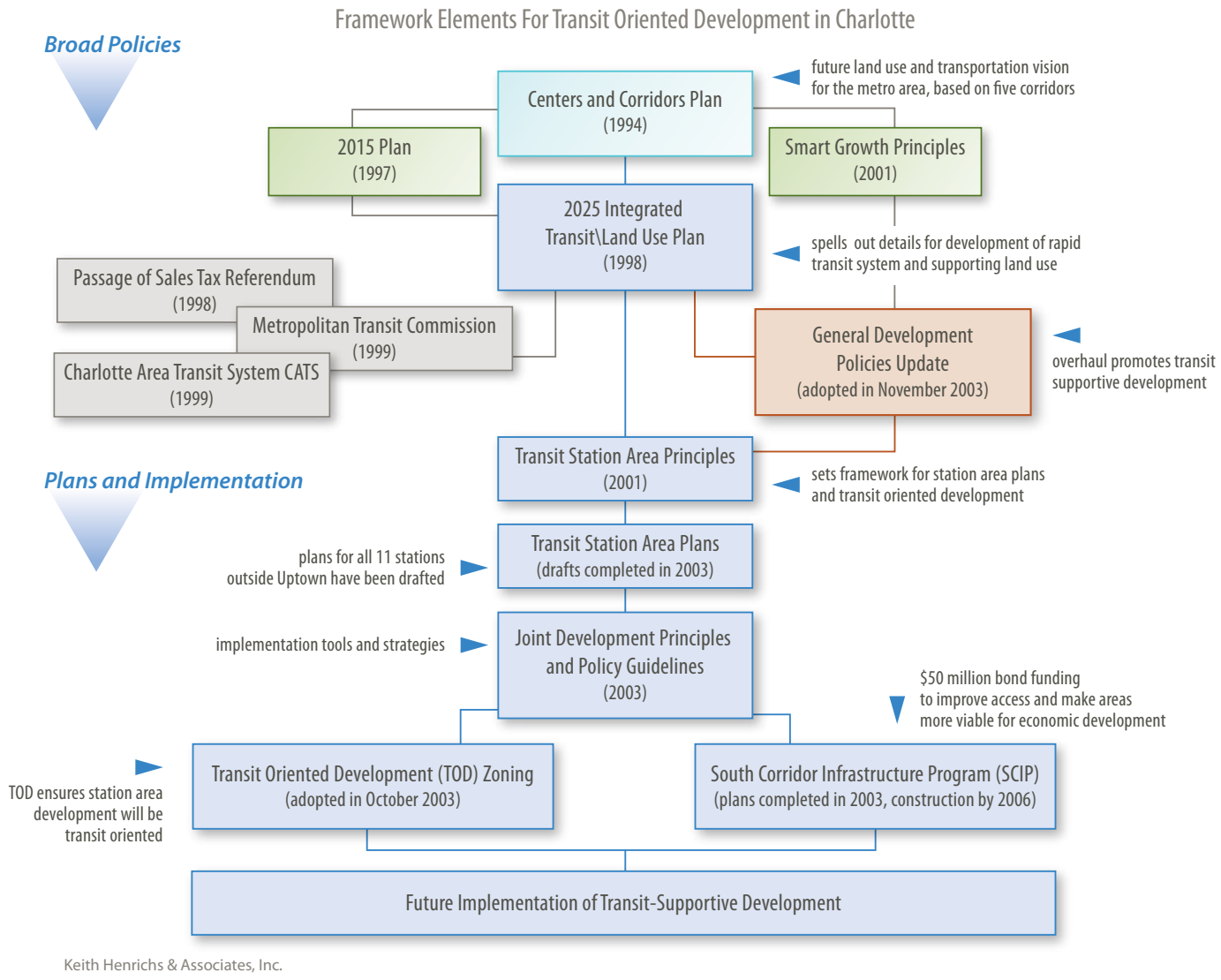
Source: Charlotte-Mecklenburg Planning, 2010.[25]

Charlotte based its transit planning program on a broad vision (see chapter 2) that tied the city's land use planning future to a series of growth corridors featuring high-capacity transit. The 2025 Integrated Land Use and Transit Plan was created to support the regional land use vision; to expand choices in mode of travel, principally through development of a regional transit system; and to support economic growth and sustainable development. An extensive public outreach effort coupled with technical analysis of transit feasibility fostered community understanding and consensus around the recommended plan, which called for phased implementation of various transit technologies along the five corridors. The Plan galvanized community support for sustainable growth supported by transit investments, with a half-cent sales tax passed through referendum providing dedicated revenue projected at $1 billion over 20 years.

> The (transit planning) process has helped us broaden our perspective. Transportation is not the only driver but one of many considerations (of community building).
>
> —Laura Harmon, Assistant Director–Planning Services
> Charlotte Mecklenburg Planning Department[26]

Detailed planning for the transit corridors started immediately after the sales tax referendum passed. The major investment studies (MIS) for all five corridors were conducted in 1999 and 2000, and these recommended a combination of light rail, BRT, streetcar, commuter rail, and enhanced bus service. In 1999–2003, the city developed a series of land use policies and regulations to enable transit-supportive land uses to ensure transit's success and achieve the vision. These included transit station area planning principles, detailed station area plans for each of the 64 stations, and TOD zoning and other regulatory changes.

Framework Elements for TOD in Charlotte



Source: Charlotte-Mecklenburg Planning, 2009.[27]

South Corridor Blue Line

Source: Charlotte-Mecklenburg Planning, 2009.[28]

The South Corridor (now called the Blue Line) was the first City to be advanced among the five corridors and it received "highly recommended" rating from FTA in 2002. It is important to note that even prior to receiving the full funding grant agreement from FTA and while necessary environmental and engineering studies were being conducted, the City was aggressively crafting transit-supportive land use policies and regulations.

The city was also careful to ensure that the technical analysis behind the transit projects reflected land use conditions and community vision. It maintains the region's travel demand model, and has developed a better calibrated model that incorporates multimodal travel demand around future station areas to use for transit ridership forecasts. With the Blue Line now built, the Charlotte Department of Transportation and CATS are utilizing data from the Blue Line for even more accurate ridership forecasts for the other four corridors. To ensure that development around future stations was aligned with transit goals and vision, the city created a development response program, a unique process and planning approach to make sure that new transit-supportive development would fit the city's expectations (see Chapter 5, Partnership).

Outcomes and Results

The Charlotte case study illustrates successful integration of land use and transportation planning and decisionmaking from the visioning effort, through project design and planning to project implementation. The decision to build transit was coupled with complementary land use planning, strategic infrastructure investments, and transit-supportive policies and regulations to ensure the success of the project.

The Blue Line light rail transit service opened in November 2007 with 15 stations serving Uptown (Charlotte's central business district) and neighborhoods on the south side of the city. In 2008, a year after its opening, ridership totaled 14,000 passengers daily, far exceeding the 1999 projected ridership of 9,100 trips. The city estimates that more than $400 million in private sector development was realized prior to the line's groundbreaking, and has projected $1.8 billion of new tax revenue for 2005–2011.

Map for NE Corridor and Station Area Plan Rendering for Scaleybark Station

Previously proposed interchange for US29/NC 39 intersection (left image); Station area plans with new network of roads (right image).

Source: Glatting Jackson and City of Charlotte, 2009.[29]

Development Activity along LYNX Blue Line (for stations outside of Uptown) 2005–2013

Increase Transportation Choices				
	Proposed	Under Construction	Completed	Total
Const. Cost (millions)	$642.7 M	$522.0 M	$228.2 M	$1.452 B
Acreage	161.43	46.43	40.46	248.47
Residential Units	4,227	773	1,887	6,887
Retail SF	172,800	319,554	101,859	594,213
Office SF	318,340	239,740	80,309	638,389

Source: Charlotte-Mecklenburg Planning, 2009.[30]

Despite the recent economic downturn, the city is proceeding with planning for the other four corridors and expects TOD to continue to occur once a cycle of renewed real estate activity begins. Draft environmental documents for the other four corridors have been developed, and preliminary engineering for the Northeast Corridor is underway and scheduled to be completed in 2010. The city expects to advance the Northeast Corridor and/or the North Corridor for applying to FTA for funding through its New Starts program.

Charlotte's planning process has facilitated development that supports transit in two key ways: establishing a technical understanding of feasible levels of development, transit service and technology; and introducing a more collaborative, consensus-oriented approach to development review that facilitates the kind of development the city needs to support its transit investments. This approach to process undoubtedly helped the city secure Federal funding for its first line, the LYNX Blue Line. More important, its integrated transit and land use planning has reinforced its commitment to improve livability.

US 29/NC 49 Development Response

US 29/NC 49 Development Response As part of the Northeast Corridor Station Area Planning effort, a development response effort helped re-direct a $50 million planned interchange near the proposed City Boulevard and Rocky River stations. Because of its scale and access limitations, the interchange posed a challenge to achieving the station area's development potential. At the same time, the interchange's construction was also not being advanced due to funding shortfalls. The City worked with various stakeholders to develop an alternative to the interchange that included an expanded street network that provides access to large underutilized properties adjacent to the proposed stations and the interstate. This effort saved the City and the State $25 million and enhanced the future potential for transit-oriented development

South Corridor Infrastructure Project

While Charlotte carefully and proactively set the stage from the policy and regulations side to provide the right setting for transit supportive development, the City also invested heavily in public infrastructure. Through the South Corridor Infrastructure Project, the City set aside $50 million to build new streets, sidewalks, and intersection improvements around the South Corridor LRT stations, prior to and during the transit construction. This targeted investment aimed at "building community" also enabled the corridor to be transit-ready and helped incent private redevelopment around each transit station. By 2008, SCIP has funded 14 miles of sidewalks, 1.5 miles of multi-use trails, 10 miles of bicycle lanes, 8 miles of street widening, 7 streetscape improvement projects, and 27 intersection improvements.

Source: Kimley-Horn and City of Charlotte.[31]

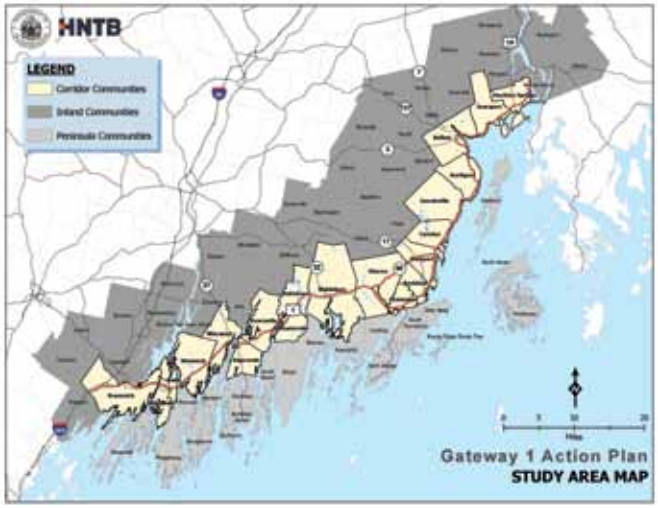
Gateway Route 1

One of the most common challenges faced by State and regional transportation agencies is aligning transportation investments with community livability goals in the context of regional corridors. State DOTs, MPOs, and communities are confronted with questions when working on corridor projects:

- How can the varying needs, objectives, and visions of diverse communities along regional corridors be coordinated?
- How can corridors that serve a regional mobility function also cater to the local access and business needs of communities they pass through?
- What is the role of regional corridors in supporting and determining future land use? What is the role of local communities in supporting the integrity of the regional mobility resource?
- How can local land use decisions impact and be linked to regional transportation needs and decisions?

The Gateway 1 initiative is one of the first corridor-wide and multijurisdictional planning processes led by MaineDOT, and is focused on integrated transportation and land use planning to address these key questions.

Study Area Map for Gateway 1



Source: MaineDOT, 2009.[32]

Overcoming Challenges

The Gateway 1 initiative was enabled in part by changes in State transportation policies promoting integrated land use and transportation planning, including the Sensible Transportation Policy Act (SPTA) amendments of 2003. The Legislature directed MaineDOT and the State Planning Office to link transportation planning processes by aligning the transportation chapters of SPTA and the Growth Management Act. Municipalities that develop plans using the new STPA guidelines are eligible for transportation planning assistance and other investment incentives, such as bonus prioritization points for MaineDOT's competitive programs, funded highway reconstruction and mobility projects, and incremental reductions in local match requirements.[6] Gateway 1 towns are ahead of many other areas since they have already done so much work in this area.[7]

The project was initiated in the context of longstanding differences of opinion among the 21 different communities and MaineDOT, and their dissatisfaction with a proposed widening project as a solution to increasing traffic congestion. The Midcoast region worked with MaineDOT to establish a vision statement for a corridor-wide integration of transportation and community land planning (see chapter 2). In 2004–2005, MaineDOT conducted an extensive community outreach process with more than 50 participant meetings to educate the public about all aspects of the transportation project development process and the baseline land use, transportation, environmental conditions of the corridor. The outreach effort and partnership was successful when, during the first phase of the project, all 21 communities signed MOUs to formally commit to the Gateway 1 planning process (See chapter 6).

The initial visioning and scenario development effort confirmed that the communities along Route 1 are interested in and committed to working toward a common future. The next step evaluated more specific options for the corridor. The preferred scenario

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[6] Kat Fuller interview (11/19/2008) with Gary Toth and Kathleen Rooney via phone.

[7] MaineDOT. "Gateway 1." **http://www.gateway1.org/**. Accessed 10/15/2008.

includes a series of compact core growth areas selected based on local comprehensive plans, existing development, availability of infrastructure, and location of sensitive natural resources. MaineDOT and its partner communities then formalized the Strategic Corridor Plan, which articulates goals and objectives and identifies projects for future development through State and regional transportation improvement programs.

This represented a different approach to a conventional State DOT planning process. By creating an environment for project development based on corridor-wide integration and project coordination, it allowed MaineDOT to move away from "spot-based" problem-solving projects and think of individual projects as phases of an integrated system. MaineDOT took a more active leadership role in coordinating local land use planning, which is usually a local role. Staff avoided the usual negative reactions to State transportation agency involvement in land use by being clear that their role was coordination and technical assistance, with actual land use decisions remaining with the localities.

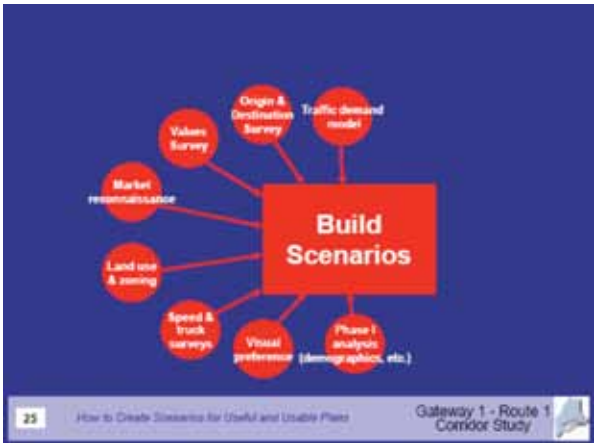
Outcomes and Results

To move the corridor plan toward project development and implementation, the Gateway 1 initiative developed an action plan. As of February 2010, 17 of the 21 towns had signed a startup agreement to formally support the action plan and appoint the Implementation Steering Committee. Through future agreements, the municipalities are expected to codify the vision into local land development regulations and comprehensive plans.

Lessons Learned

The Gateway 1 process was unprecedented in the corridor and MaineDOT's history. By taking a positive approach that offered local governments an equal partnership in the Gateway 1 efforts, MaineDOT achieved a more fluid interaction between land use planning, typically administered at the local level, and State transportation planning. MaineDOT's willingness to use a different approach for addressing transportation needs, while embracing the collaborative process to involve land use partners, proved worthwhile. Gateway 1 now provides a long-term strategy to coordinate growth and transportation decisions among the various towns and MaineDOT. As the communities work toward a shared vision for Route 1, they have come to expect a more livable and sustainable corridor.

MaineDOT: How To Create Scenarios for Useful and Usable Plans



Source: MaineDOT, 2009.[33]

Albany CTDC New Visions Plan

Many MPOs have difficulty making sure the projects they identify truly respond to community needs. This goes beyond just representing constituent communities in long-range planning and transportation improvement programs; it means identifying projects that fully support community goals.

Overcoming Challenges

One MPO's approach to this issue is to provide direct technical assistance to ensure the transportation plan's fundamental principles and projects are understood by member communities and in line with community needs. Based on its New Visions LRTP, CDTC undertook a similar collaborative approach, providing local area planning assistance through the Linkage program. The Linkage program is a planning assistance program through which CDTC awards a portion of its FHWA planning funds to local governments on a competitive basis. The program was launched in 2000, and projects were selected based on their ability to demonstrate

CASE STUDY HIGHLIGHT

US 202 Parkway, Pennsylvania

The 1960s Beltway Link Concept

U.S. Route 202 in Pennsylvania is a 59-mile-long roadway that runs from New Jersey to Delaware, initially envisioned as a continuous expressway serving regional travelers. The 1968 U.S. 202 Expressway concept prompted townships along the corridor to reserve future ROW for the new roadway and to orient land use practices toward a future that has the expressway. While the various sections of the roadway have gone through some degree of planning, few have been built, and several sections were subsequently down-sized or abandoned due to community opposition, environmental impacts, and funding constraints. The segment from Montgomeryville to Doylestown (Section 700), where an expressway bypass concept was originally proposed, was one of those that encountered community opposition. After lengthy litigation, the 9-mile, $465 million project eventually received environmental approvals, although community opposition continued.

2005 Parkway Concept

In 2004, PennDOT, prompted by severe budget issues, put the Section 700 project and several other large-scale, capacity-adding projects on hold for further evaluation. PennDOT and the community recognize there is still a need for additional access and mobility to support long-term redevelopment needs throughout the corridor.

Compelled to work with its land use partners and community leaders, PennDOT held a series of collaborative workshops to seek a more realistic solution that would recognize the regional importance of U.S. 202 and the local travel needs of residents and businesses along the corridor. The workshops engaged the 12 municipalities and developed a consensus among the corridor's various interests and growth goals. The solution reached was known as the U.S. 202 Parkway. The concept built on ideas from an alternative solution proposed by a grassroots advocacy group, and used the proposed U.S. 202 Section 700 alignment for an at-grade parkway that would be reduced in scale from the original expressway bypass plan. Designed with lower speeds and access only at key intersections, the parkway would complete the regional and local network but without attracting a significant volume of new trips to the area. The parkway also incorporated numerous multimodal features, including a continuous shared use path.

The parkway concept was completed in 2005 and is projected to cost $206 million, a cost savings of almost $260 million compared to the original expressway concept. Although the parkway concept garnered support from the community and PennDOT, the State had challenges securing Federal funding since the original expressway concept already had Federal environmental clearance. PennDOT decided to advance the parkway plans and funded construction with State money alone. PennDOT began construction in 2008, and the U.S. 202 parkway is scheduled to be completed in 2011.

Concept to Construction in 3 Years

The parkway's success includes visioning and community engagement that moved a project that was in the planning stages for decades to one that went from concept development to construction in just 3 years. This short period entailed much collaboration and participation among PennDOT, municipalities, and the State's resource agencies.

Even with the project's relatively short timeframe, PennDOT representatives felt that an even more collaborative work environment among regional partners would have further increased the efficiency of delivery. At times, the close focus of each resource agency on its own core concern prevented understanding the larger goals of the project and true cross-agency support.

alignment to New Visions principles. Studies are small-scale efforts that include corridor studies, small area plans, or multimodal plans and studies, and can help municipalities articulate planning priorities and test the core elements of the New Visions plan. In its LRTP selection process, CDTC gives a higher priority to projects that have come from Linkage studies.

The grant application process is a simple statement of purpose and ways the study responds to the New Visions goals. CDTC apportions one-quarter of its FHWA funds to the program, roughly $400,000 annually, with local governments required to provide a 25 percent match. Studies are managed by CDTC staff and conducted by consultants, ensuring products that are both useful for the municipalities and consistent with regional policies. Linkage studies have been adopted by municipalities as components of comprehensive plans or area master plans, used to leverage additional support for planning processes, and provide a stream of viable project candidates for CDTC's TIP.

Outcomes and Results

New Visions has been updated three times since the 1997 adoption of New Visions 2015. As of early 2010, CDTC has funded 65 Linkage studies, representing $4.5 million in Federal, State, and local funds committed to the program. The studies also help gather public input and response for the region's New Visions 2030 plan update. The expanded principles of New Visions 2030 incorporate transit service, urban reinvestment, alternative roadway design (especially roundabout intersections), and capacity-adding projects. It included a large-scale scenario planning exercise to consider a range of possible future outcomes. Since many small communities lack their own technical staffs to guide planning decisions, the Linkage Program has provided technical resources to introduce a wide range of planning issues to partner communities.

Lessons Learned

CDTC staff continue to see challenges translating conceptual studies to actual project design. In many cases, a project captures community intent, but the design process may not fully address concerns raised at the planning level. Since the first New Visions plans, many projects have been completed under the Linkage program. CDTC cites these as examples of the kinds of projects this vision can achieve:

- Creating a NY 5 BRT and land use plan across five municipalities, anchored by two city downtowns at each end.
- Equitable access to federal funds to allow local governments to compete fairly with the state for transportation funding and to ensure that funding decisions are based on the function of the facility rather than ownership.
- Continuing with steady progress region-wide on transportation plans, even during financial shortfalls.
- Constructing dozens of spot bike and pedestrian accommodations, sidewalks, and trails.
- Leading to the first advanced regional transportation management center, road patrols, and transit-highway information connections.
- Completing downtown Schenectady's State Street Streetscape project.
- Funding 65 joint planning studies in 38 municipalities as of 2010 with over $4,500,000 in funding.
- Building the Rensselaer Rail Station.
- Rehabilitating I–87, I–90, and other major roads.
- Purchasing new hybrid-electric bus fleet for a local transit agency.

CASE STUDY HIGHLIGHT

Route 50

The Route 50 Corridor Coalition was formed as a partnership of five existing local nonprofit groups with the common purpose of developing a corridor-wide vision based on preservation and enhancement of natural resources and community character. Route 50 demonstrates the importance of a unified agency-community approach to changing the planning process to better facilitate livability-oriented projects. Although the traffic calming plan enjoyed widespread community support, including from local and county officials, VDOT was initially not open to the proposed plan as an alternative to the widening project. Because of this initial conflict, VDOT was not actively engaged in the planning process. This changed when, after the congressional funding allocation was secured, the Commonwealth Transportation Board directed VDOT and the coalition to work together through the Route 50 Traffic Calming Task Force.

The task force was a way for VDOT and the Route 50 Corridor Coalition to work together, and it eventually provided a venue for collaboration between the two entities. Because of the highly participatory nature of the visioning process, VDOT was also able to build on this and continue a similar approach throughout project development. For instance, an email listserv for residents, businesses, and other stakeholders in the corridor was developed that proved helpful in increasing information sharing and coordination. VDOT also maintains project blogs and other communication tools to inform the public of design and construction progress, proactively addressing potential issues and avoiding negative public comment or confusion.

The project also illustrates the need for transportation and land use agencies to constantly expand their knowledge and tools to respond to the changing needs of communities. These include keeping up-to-date on solutions from project scoping (effective community engagement strategies), project design (flexible design standards that consider community desires and context), and project delivery (better understanding of technical constraints and costs during the visioning process will help ensure more efficient implementation).

3.3. Conclusion

The case studies explored in this chapter all incorporated livability into transportation projects by integrating mobility goals with other community needs through a planning approach or process that differs from conventional practices. Some of the projects were successful outside the responsible agency's established process (especially Maine's Gateway 1, Virginia's Route 50, and Pennsylvania's U.S. 202), while others have institutionalized a change in approach, supporting innovative transportation programs (Charlotte, Albany CDTC New Visions plan and Linkage Program, and the WSDOT Community Design Assistance Program).

- ***Incorporating livability goals into project development processes can help define transportation needs or problems prior to developing solutions.*** The case studies showed that altering the process for which projects are developed or planned can help stakeholders better agree on key issues before advancing to solutions. WSDOT's Community Design Assistance Program goes beyond conventional highway-based solutions in responding to real community needs. It uses community outreach and technical assistance to ensure that land use and transportation issues are addressed together. Similarly, in Virginia's Route 50 project, the process expanded the transportation agency's approach to include traffic calming so that it fits more appropriately in the road's context, while still providing for more traffic capacity.
- ***Rethinking the planning process facilitates partnerships necessary to effectively implement a project.*** In many cases, multiple departments within a single jurisdiction can create "silos" that prevent meaningful coordination. In Charlotte, the city's organizational structure and new policies allowed for joint ownership of the transit project across departments. This provided common community-building goals, broadening the perspective of each department's focus so that transportation is not the only driver of project goals. Albany's CDTC demonstrates that an MPO governance and project selection system can effectively reflect its constituents' needs by creating regional consensus through a planning process.

CASE STUDY HIGHLIGHT

WSDOT Community Design Assistance

The Washington State Department of Transportation (WSDOT) provides another example of how land use planning and community visioning expertise can be incorporated within a DOT, and how integrated land use and transportation planning can help address transportation issues. The Highways and Local Program Division of WSDOT provides technical assistance "to improve roadway design and promote partnerships between WSDOT, local agencies, school districts, tribal nations and other groups." Communities Design Assistance operates within Highways and Local Programs to provide specific technical assistance services. The group is comprised of planners, urban designers, architects, mediators, engineers, and geographic information system (GIS) specialists who help local communities seeking assistance in addressing transportation issues through:

- **Plan and Policy Development:** Helping communities develop plans, policies, zoning codes, and ordinances that support efficient transportation and livable communities. The group specifically offers assistance in developing elements of comprehensive plans in the areas of street design and standards, nonmotorized transportation policies, and transportation-supportive land use policies.
- **Mediation Services:** Mediation or dispute resolution for transportation-related issues, construction, real estate, property, and other issues.
- **Transportation Design Charrettes:** Facilitation of daylong to multiday charrettes or workshops to develop a common vision for a corridor or other transportation project. The office of community design assistance engages professionals and stakeholders from other agencies and provides the right venue for collaboration.

Over the past 5 years the group has provided community design assistance to a long list of communities in the State and conducted targeted, community design workshops for 15 communities, including Bothell, Cle Elum, Concrete, Goldendale, Longview, Morton, Roslyn, Royal City, Sekiu, South Bend, Spanaway, Sultan, Tumwater, Union Gap, and Woodland. They have also initiated a new project with Seattle and the Puget Sound Clean Air Agency to study urban design in two neighborhoods and develop potential VMT reduction measures as part of this. Its work supports WSDOT's livable communities efforts and increased community awareness on the importance of visioning and planning in the transportation development process.

- *Changes in process help to align fiscal realities with true costs of transportation projects.* U.S. Route 202 in Pennsylvania is one of 26 projects that PennDOT had to put on hold because of funding constraints. PennDOT's existing project delivery process has allowed Route 202's original highway plan to progress for decades to a point where millions have been invested in designing and partially building the project. Through a collaborative design process, partners acknowledged funding limitations, and realistically weighed the benefits of additional capacity versus its impacts. Currently, PennDOT is working with resource agencies, MPOs, rural planning organizations, and municipal representatives to develop a revised project delivery process that would allow early decisions to be made with better data and analysis to ensure that projects meet purpose and need, are consistent with the region's goals, and are affordable.

3. Planning and Process—Endnotes

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4. Policy

4.1. Introduction

Updating agency policies can set the stage for long-term success in implementing livable transportation projects. Some agencies have developed livable transportation solutions one project at a time, while others have adopted policies that require program-wide change. While the project-by-project approach allows hands-on experience and learning, it may have less effect on the agency's long-term project list until the overall programs are updated. Integrated policies that support livable transportation solutions can have a lasting and program-wide effect, while the application of new policies to projects can help demonstrate the intention and direction of a transportation agency.

Policy approaches can help overcome a variety of challenges—from the funding stage through construction. This chapter presents successful ways that policies have been used to overcome some of the following challenges.

- *Agencies can use policy approaches to improve concept development driven by strict conformity to design manuals.* Transportation agencies may want to allow a different design from that prescribed in its design manuals, but conformity is codified in policy. The AASHTO Policy on Geometric Design of Highways and Streets (the "Green Book") provides for flexibility in highway design and has been supplemented by other publications that emphasize context-sensitive design. However, many State agency design manuals are more rigid and produce a more uniform set of project outcomes. A transportation agency can permit an unconventional project approach through design exceptions, but such processes can be time-consuming and complicated.
- *Policy has helped to integrate community land use and transportation agency objectives.* Transportation agencies are facing controversy over projects that appear counter to the direction communities envision for their land and economic development. In many cases, this is due to perceived community and environmental impacts, but can also stem from the transportation facility's failure to support more sustainable development opportunities. Policy changes have enabled a transportation agency to better align and coordinate transportation planning and programming with local community goals.
- *Transportation agencies are financially constrained and may not be able to fund infrastructure for TOD.* TOD has demonstrated how development can support enhanced transit service through enabling the appropriate type and form of development, land uses and densities, and connections to other travel modes. Agencies responsible for transit planning and project development are often limited to fund only actual transit facilities, and cannot help facilitate TOD. Targeted policies can address this issue while encouraging increased private investment in TOD.

- *Targeting transportation and land use investments in the same places produces more sustainable projects.* Although land use decisions depend on transportation infrastructure to support private development, land use planning and development approvals are not always coordinated with transportation planning and project development. Policies that require integrating the two can create better places, more cost-effectively.

4.2. Case Studies

Smart Transportation, PennDOT

Agencies responsible for transportation project development are often driven by a set of legislation and policies that imply commitment of resources to meet a certain level of performance. The planning process is often dominated by preservation or enhancement of system capacity, movement of freight, and congestion relief. Many transportation agencies are committed through policy to deliver programs beyond available revenue. PennDOT's Smart Transportation initiative sought to better align its financial operating environment to statewide needs, through a department-wide policy shift that calls for partnership with local governments and linking land use planning and transportation decisionmaking.

PennDOT has undergone a paradigm shift in recent years as a result of changing financial, economic, technological, and social contexts. Declining statewide transportation funding, increasingly scarce Federal assistance, and increases in construction costs had created a backlog of unfunded or underfunded projects. PennDOT also recognizes that not only did it not have enough funding to build programmed projects, it was also facing increasing maintenance needs for one of the Nation's oldest infrastructure systems. The department's project delivery process was increasingly perceived to be lengthy, not predictable, and not consistently integrating local community goals.

Overcoming Challenges

Smart Transportation is Pennsylvania's response to the changing needs and demands of today's transportation system, and is a policy directive to link land use and transportation planning, focus on system maintenance and preservation, balance priorities among all transportation modes, and practice true fiscal responsibility. This new way of doing business is successfully carried out by changing the rules, changing the process, and increasing partnership efforts.

PennDOT's new policy direction adopted livable transportation principles as the basis for planning and project decisions, a flexible design resource that complements the statewide design manual, and a series of policy changes related to activities where land use and transportation decisions intersect the most often, such as in providing new guidance for highway occupancy permits and development of local comprehensive plans.

This Smart Transportation approach was intended to improve PennDOT's ability to respond to financial conditions, while better matching roadway design with project context. The department adopted a series of Smart Transportation principles that build on FHWA's CSS initiative. The principles emphasize overall project cost as a critically important factor in decisionmaking, a need to respond to project context, and to expand measures of effectiveness by considering value-to-price ratio as a reason to select and develop a project (as opposed to meeting capacity-based or LOS-based criteria at higher cost).

PennDOT Smart Transportation Principles

1. Money counts
2. Understand the context; plan and design within the context
3. Choose projects with high value/price ratios
4. Enhance the local network
5. Look beyond level-of-service
6, Safety first and maybe safety only
7. Accommodate all modes
8. Leverage and preserve existing investments
9. Build towns, not sprawl
10. Develop local governments as strong land use partners

Source: Pennsylvania DOT, 2008.[34]

After setting guiding principles, PennDOT, in partnership with the New Jersey Department of Transportation (NJDOT) and Delaware Valley Regional Planning Council (DVRPC), developed the Smart Transportation Guidebook. The guidebook provides for flexible design standards that better respond to each community's context and future vision, and encourages creative and alternative ways of more efficiently addressing transportation issues. PennDOT has adopted the guidebook as interim policy guidance, giving its staff the assurance and documentation they need to actually apply Smart Transportation principles to all transportation projects.

The agency is currently working with its planning partners to revise its project delivery process to reinforce the Smart Transportation principles. The new process strengthens the role of planning earlier in project delivery to ensure more predictable schedules and budgets and more consistency with community goals. The new process also emphasizes asset management strategies as a component of LRTPs and programming.

PennDOT realizes that changing existing culture, policies, and procedures to align with Smart Transportation requires buy-in from all partners, and has been engaged in a significant outreach and training effort. PennDOT has launched a multimedia communications campaign, including more than 150 interactive workshops and presentations with internal staff and partner organizations. PennDOT also recently launched the first round of the Pennsylvania Community Transportation Initiative, a $60 million grant program for community-sponsored transportation and land use projects. The program has enjoyed much interest and is intended to help demonstrate how Smart Transportation can be applied to all PennDOT planning and construction projects.

Source: Pennsylvania DOT, 2008.[35]

FHWA and FTA have given the Smart Transportation Guidebook the 2008 Award of Excellence.

Guiding Principles for Flexible Design

- **Tailor solutions to the context**. Roadways should respect the community's character as well as current and planned land uses.
- **Tailor the approach**. The project approach should accurately reflect true need, complexity, and the full range of solutions.
- **Plan all projects in collaboration with the community**. Both transportation agency and local government have responsibilities: to make transportation projects consistent with local plans, and for local plans to reflect sound land use planning.
- **Plan for alternative transportation modes**. Incorporate transit and nonmotorized users in project design, knowing that they can help reduce long-term vehicle travel demand and extend a project's useful life.
- **Use sound professional judgment**. There is no one-size-fits-all approach to good decision making: project design can and should use flexibility in its approach.
- **Scale the solution to the size of the problem**. Find the best solution that fits within the context, is affordable, has community support, and can be implemented in a reasonable timeframe.

Source: Pennsylvania DOT, 2008.[36]

Outcomes and Results

Although Smart Transportation is a new program, it has increased awareness of the linkage between transportation investments and land use decisions. Like most States with multiple DOT districts and regional planning organizations representing thousands of local government entities, the State struggles to respond to local needs. Smart Transportation has helped demonstrate that States and localities share responsibility—for PennDOT to apply flexibility and attention to cost and context in making transportation decisions, and for local governments to practice sound land use planning principles. PennDOT has greatly enhanced its ability to develop transportation projects that support the community and are financially sound.

Lessons Learned

One notable lesson from the Smart Transportation initiative is that agencies respond best to a unified direction and mission, with a message and benefits that can be concisely communicated. The Smart Transportation message was supported by policy changes, training, and planning tools that helped make the initiative real and tangible.

At the same time, PennDOT has learned that organizing for change is difficult. Despite a committed chief executive, active central office staff, and several district-level chief engineers working to reshape longstanding projects to fit Smart Transportation principles, PennDOT has continued to face complications in the rollout partly because of its own size (12,000 employees). PennDOT sees the need for all levels of the agency to apply the principles in meeting its responsibilities. PennDOT has learned to advance select projects as quickly as possible to demonstrate Smart Transportation principles in action. Delivery of projects that reflect policy principles helps local governments and the public see that Smart Transportation principles can be translated into real projects that meet the objectives of both the community and the agency.

Pennsylvania Township News Cover

Source: Pennsylvania State Association of Township Supervisors, 2009.[37]

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Through an aggressive campaign, the Smart Transportation message has now been shared and being embraced by various local partners. In 2009, the Pennsylvania State Association of Township Supervisors ran a cover article on Smart Transportation strongly supporting the initiative.

Smart Transportation Website

Source: Pennsylvania DOT, 2008.[38]

PennDOT's multi-media campaign includes an interactive website on Smart Transportation, **www.smart-transportation.com**.

Another lesson that PennDOT's case illustrates is the importance of transportation planning—understanding the needs of complex stakeholders and evaluating alternative solutions beyond the activities of project programming. Planning involves exploring what and where the real problems and priorities are, identifying available options and costs, and relating this to community and regional priorities.

Atlanta Regional Commission Livable Centers Initiative, GA

ARC, the regional agency and MPO that coordinates regional land use and transportation planning, developed LCI to provide assistance to local governments to develop integrated transportation-land use plans for designated high-activity centers and corridors throughout the region. Metropolitan Atlanta is one of the fastest growing urban areas in the United States, adding approximately 1.5 million residents between 2000 and 2009, for a total population of 5.6 million.

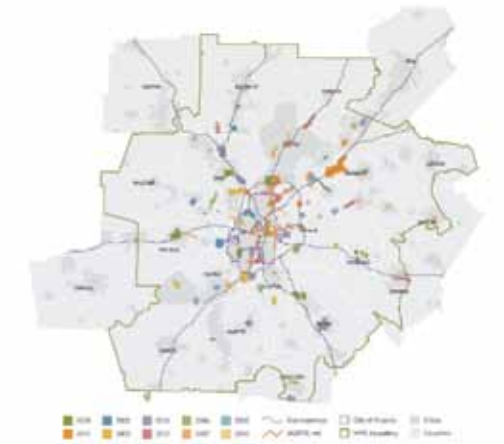
The region does not have distinctive geographic features limiting outward expansion, and relatively small county and municipal land areas have tended to encourage rapid outward expansion since development limited by infrastructure or politics in one jurisdiction need not look far to find a more supportive environment. One of the results of this combination of factors is that driving distances have increased. Metro Atlanta residents, on average, drive almost 35 miles a day, one of the highest per-capita distances traveled in the United States.

As in other large metropolitan regions that are heavily dependent on automobile travel, this trend toward increased travel distances has had environmental implications. In the 1990s the region failed to comply with the Federal Clean Air Act, leading to potential withholding of Federal funding assistance for highway construction. The Atlanta region is more than 6,000 square miles and is characterized by low population and development densities. Coupled with limited Federal highway funding to accommodate additional growth, these factors pointed to a need for alternative approaches to accommodating growth, both for a more sustainable form of development and to improve air quality by reducing vehicle emissions.

Overcoming Challenges

ARC has committed through policy that planning, whether at the regional or local levels, and resulting transportation projects should support quality of life in the region's centers and high-activity corridors, promoting livable, balanced communities and reducing the need for vehicular travel throughout the region. The LCI program was initiated in 1999 to help carry out this policy direction, to better link transportation and land use planning with long-term goals of VMT and congestion reduction and improved in air quality. The program awards grants to individual or partnered local governments and nonprofit organizations to prepare plans to enhance existing centers and corridors. The LCI studies provide a framework for local governments to take advantage of private investments to help accomplish infrastructure objectives.

LCI Study Locations (2000-2009)



Source: Atlanta Regional Commission, 2009.[39]

As of 2010, over 100 LCI studies have been completed throughout the Atlanta region.

Outcomes and Results

More than 100 studies had been completed by early 2010, representing nearly $9 million in planning assistance funding and nearly $2 million in supplemental funding to help communities that have completed LCI studies to further define transportation projects for later LRTP/TIP inclusion. In addition, more than 1,000 development project proposals have been associated with LCI study areas. These projects, if completed, will add more than 80,000 residential units, 19 million square feet of commercial space, and 38 million square feet of office space.

The LCI program has been widely recognized for its progressive approach to linking land use and transportation, and for tying this to Federal transportation funding and environmental protection. Awards include the American Planning Association's 2008 National Planning Excellence Award for Implementation, EPA's 2008 National Award for Smart Growth Achievement in Policies and Regulations, and FHWA and FTA 2004 Transportation Planning Excellence Award for Transportation and Land Use Integration. While many of the infrastructure components of the LCI studies have not yet been implemented, ARC's own evaluation of the effectiveness of the LCI program suggests that the principles of complementary land uses in walkable, compact centers have potential to offset growth in the region's overall travel demand and VMT.

The program's principles—increasing density to support transit use, mixing land uses to promote walking and bicycling, and investing in related infrastructure—complicate the analytical models that ARC uses to gauge the LCI program's efficacy. This is due largely to the regional nature of its evaluation, relying on the Atlanta regional travel demand model, which recognizes the intensity of land uses but associates them only with the regional-level infrastructure that the analytical tools include (mostly vehicular travel added to collector and arterial roadways). Like most MPO models, this evaluation tool is not equipped to analyze the improvements a development or plan can have for transportation alternatives and broader community livability.

Concept sketch from an LCI study.

Source: Tunnell-Spangler-Walsh & Assoc/Atlanta Regional Commission.[40]

Over 90 percent of the completed LCI studies have been adopted by their local governments into comprehensive plans, and the studies have generated hundreds of projects for LRTP and TIP inclusion.

Key Lessons Learned

Since the program is administered by a regional agency with Federal funding used to help identify projects eligible for Federal aid, local projects tend to be underestimated. As LCIs focus on finer planning detail, the studies identify local projects that serve desired development patterns. If these local projects are not eligible for Federal funding assistance, implementation could be delayed while local governments attempt to secure funding and coordinate infrastructure with private development. This can be more of an ongoing challenge that points

to limitations of the Federal transportation planning model, which was developed when national transportation priorities were to implement the interstate highway system. Many LCI studies have incorporated broad community agendas to the point that implementation, largely unfunded with the exception of transportation-specific recommendations, becomes highly challenging for local government sponsors.

Charlotte Integrated Transit and Land Use Planning

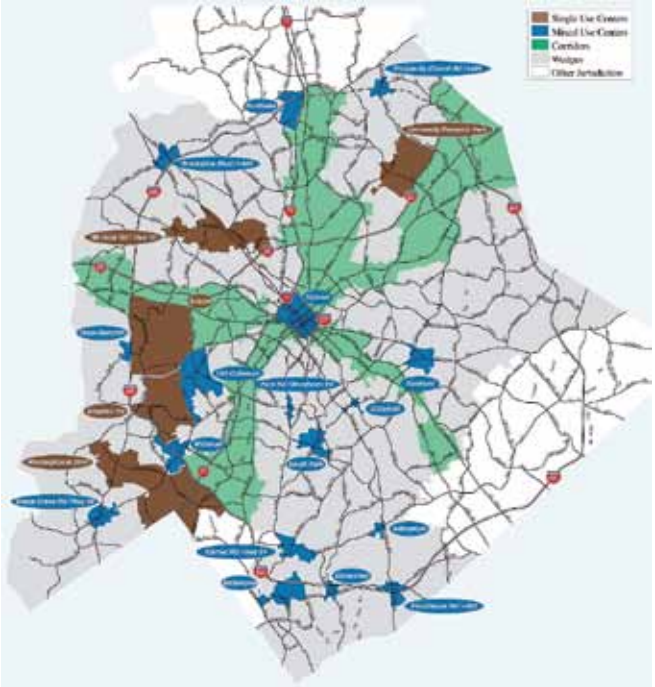
Policy approaches to achieving livability in transportation are also effective at the local level, especially for land use planning, development review, and permitting. Policy platforms that establish livability principles as desired goals are essential in determining future direction for growth and development. This case study examines Charlotte's Centers, Corridors and Wedges policy framework as the basis for its Integrated Transit and Land Use Plan.

Charlotte experienced rapid growth from the 1970s through the 1990s due to its evolving role as a banking and financial center. Poised to become a leading southern city yet wary of traffic congestion and limited transportation choice as in other Sunbelt metropolitan areas, Charlotte sought to invest in transit as a long-term transportation strategy. However, by the late 1990s and early 2000s, transit planning and Federal funding requirements made transit initiatives a lengthy process. Charlotte needed to ensure that ongoing growth and development would not compromise the chances for transit to successfully compete for State and Federal funding.

Overcoming Challenges

In 1994, Charlotte decided to coordinate transportation, land use, and economic development with a broad, city- and region-wide vision known as the Centers, Corridors and Wedges Plan. It called for future development to be focused on high-capacity transit corridors linking Uptown Charlotte (the city's central business district) to other employment and activity centers, with the balance of the city (the "wedges") focused on existing neighborhoods and open space. The goals were to establish long-term growth management strategies around this corridor-based concept, and to provide policy guidance to better link transportation and land use as future development occurred, pursuing transit along the corridors to support the higher density.

Centers, Corridors, and Wedges Vision Plan



Source: Charlotte-Mecklenburg Planning, 2009.[41]

Charlotte's Centers, Corridors and Wedges Plan helped city departments to have a common vision for growth to be guided to areas that can support it, and steered away from areas that cannot. This work led to the 2025 Integrated Transit and Land Use Plan, which was the basis for the MPO's transit improvement plan in its 2025 LRTP. The city has also since adopted more specific policies directing the roles of each of the departments to work toward the vision set by the Centers, Corridors, and Wedges Plan.

In this general planning context, Charlotte has developed land use planning principles that aim to strengthen its city- and neighborhood-supporting infrastructure. In the growth corridors, the city develops small area plans with specific, parcel-by-parcel land use recommendations and network connectivity recommendations. The city's Transportation Action Plan (TAP) reserves nearly 15 percent of transportation funding for street and network improvements in

the centers and corridors, and identifies key walking, cycling, and livability components in larger transportation projects to balance connectivity with overall mobility. As transit planning advanced and implementation of the South Corridor light rail transit line began, Charlotte continued crafting and refining its land use policies and regulations to support the land use vision established in the plan. It also developed transit station area planning principles, detailed station area planning efforts, and adopted regulatory changes to enable TOD.

36th Street Station (Eastfield Station) Area Concept, North Corridor

Source: Charlotte-Mecklenburg Planning, 2009.[42]

Outcomes and Results

Since adoption of the Centers, Corridors and Wedges Plan, Charlotte's population has increased from approximately 440,000 to 680,000, with much of that occurring in the centers and corridors. In addition to supporting policies and programs, Charlotte has also actively begun advancing transit projects. The South Corridor (now called the Blue Line) was the first to be implemented and is successful in both ridership and surrounding TOD. This is a direct result of a forward-thinking regional growth strategy, coupled with targeted land use and infrastructure investments and a coordinated transit-supportive land use policy and regulatory framework.

Lynx Blue Line as it goes through Uptown Charlotte

Source: Charlotte-Mecklenburg Planning, 2009.[43]

Lessons Learned

Charlotte's experience has demonstrated that a central growth vision, supported by a growth policy framework, must be established before more development-specific plans and policies can have significant effect. Charlotte realized that many of its well-intended policies had limiting effects on implementation of other policies, with a common vision required to reshape city policies to work more effectively in concert. One example of this is the provision of open space in development occurring around its transit stations. Balancing parks and open space with higher density development is a key strategy for successful TOD. However, parks are the responsibility of a separate agency not under the direction of the City Council. That department has its own mission and financial constraints, leading to ongoing challenges in coordination between parks and open space needs and TOD goals.

Charlotte's development response program, where the city works with developers in "real time" to communicate its expectations for livable, transit-supportive development, has also reinforced interdepartmental coordination. Responding quickly and uniformly to big projects allows the development community to have greater confidence in what it will be able to achieve.

Maryland Department of Transportation Transit-Oriented Development Initiative

MDOT is a single agency responsible for transit, highway construction and maintenance, freight transportation, and several other transportation-related functions. As it continues to invest in transit infrastructure and provide service, it has sought to capitalize on development opportunities adjacent to transit stations, improve transit ridership, and manage growth and development in a way that assists other agencies under the MDOT umbrella.

Overcoming Challenges

MDOT had limited funds for TOD projects, and faced funding and procedural challenges to providing adequate parking to support transit and surrounding development. The public finance mechanisms available to MDOT, especially tax increment financing (TIF), could not easily be applied to TOD because it is private development with supporting public infrastructure. MDOT was further limited by legislation to using its funds for transportation-related public purposes, which included transit stations and some supporting facilities but not development initiatives.

MDOT first created an Office of Real Estate to help prepare MDOT-owned properties for private development and strengthen its ability to support and fund construction of TOD. The office is staffed with an economic development/real estate team that has a strong partnership with the Governor's Office. The Office of Real Estate follows a TOD strategy built around several goals:

- To assist in the marketability and entitlement of transit station area properties, including property assembly;
- To enhance a more widespread understanding of TOD, especially among other Maryland State agencies and local jurisdictions;
- To strengthen public support for TOD throughout the Baltimore and Washington metropolitan areas; and
- To enhance the potential for Federal funding to expand transit in the Baltimore area by demonstrating that development patterns can support transit.

In addition to the real estate office, MDOT initiated and State lawmakers adopted groundbreaking legislation (the Transit-Oriented Development Bill of 2008) that allows for flexibility in funding and implementing TOD.

Outcomes and Results

MDOT's Office of Real Estate and the Maryland Transit Agency (MTA) have tracked several TOD case studies to demonstrate the effectiveness of their efforts. At the Symphony Center TOD, MTA entered into a long-term lease agreement to develop an underutilized 6-acre site at the Cultural Center Light Rail Station in June 2000. It anchors West Side revitalization efforts.

At the State Center office complex, the State selected a master development team for the main State government complex in central Baltimore. The project emphasizes proximity to two transit stations (the Baltimore Metro subway and Baltimore Light Rail surface line on Howard Street). State Center is presently an underutilized, 25-acre, State-owned site that includes 5 buildings and 1,300 parking spaces. MDOT will assemble resources that can design, entitle, finance, construct, and market mixed-use, mixed-income, urban TOD that supports surrounding neighborhood needs.

Existing State Center Office Complex and Proposed State Center Master Plan with TOD.

Source: Design Collective, Inc. and Maryland DOT, 2008.[44]

MDOT is pursuing legislation in 2010 that would expand on the 2008 TOD bill to make TOD implementation more feasible. The proposed legislation would give local governments more flexibility and new tools to implement public infrastructure projects including TOD, through TIF and special taxing districts, and cooperative project and funding arrangements among State and local government entities. It would also permit TIF funds to be used for operations and maintenance of TOD facilities such as parking structures.

Lessons Learned

Although MDOT has demonstrated successful TODs, it faces challenges with local governments that are not supportive of TOD efforts. While TOD developments typically increase tax base and add vitality to communities, some local governments are reluctant to allow greater densities. MDOT has also tried to use the TOD initiative to increase the supply of affordable housing, but must also coordinate with local government policies on providing affordable housing. The State of Maryland is nationally recognized for leadership in smart growth planning. MDOT has been proactive in its commitment to develop transportation investments and facilities, and support for TOD that supports economic growth and neighborhood revitalization close to transit facilities.

Housing + Transportation Affordability Index

In North America, a commonly accepted guideline for housing to be considered "affordable" is when a household's housing expenditure is 30 percent or less of its income. From Federal agencies, to planning agencies, to the private sector, this ratio is typically used as a benchmark for housing policies, land use planning, and home financing. It also influences consumer decisions about which homes it can afford to purchase or rent. This affordability measure has traditionally only included the cost to rent or own a house, including utilities, taxes, and insurance costs. In reality, a family's determination of its ability to afford or desire a home or an apartment in a given location is typically balanced with the time and cost of transportation, in terms of convenience to amenities, commuting time, and expense.

The true cost of housing is therefore a combination of the direct costs associated with housing and the indirect transportation expenses resulting from a housing decision. Recognizing that for U.S. households transportation is the second highest household expense, the Chicago-based Center for Neighborhood Technology (CNT), in partnership with Center for Transit-Oriented Development (CTOD), developed a tool that provides a more accurate analysis of housing affordability by factoring in both housing costs and associated transportation costs for the neighborhood. The Housing + Transportation (H+T) Affordability Index, as an interactive online tool, provides access to data for 337 metropolitan areas across the United States. By integrating data from the census block group level, the model predicts a household's total transportation expenditures for a given household size and income at a neighborhood level. The tool can be used by households, policymakers, planners, and the private sector to help guide decisions about home location, transportation, housing policies and development, environmental policies, new and infill development, and infrastructure investments.

The analysis provided by the H+T Affordability Index illuminates how the conventional housing affordability index can lead to policy decisions that have perpetuated inequitable access to transportation. At the local level, the conventional index provides individuals an implicit incentive to seek homes that can meet the affordability goal, which are increasingly farther from services and employment, and where transportation options are fewer. In many cases, the more "affordable" locations cause households to pay more for transportation than expected, even more than housing, which causes an unplanned burden on already financially stretched families. With more driving, congestion and air quality are impacted. Households unable to purchase more cars to meet the needs of each family member may forego education or work opportunities. Fueling the limited mobility in these areas is the traditional policy focus on road construction, which has limited mobility choice by leaving less funding for rail and bus transit provisions, and by designing roads for speed rather than connectivity and walkability.

Many policies in housing and transportation work against one another to perpetuate inefficient housing and transportation systems. For example, the conventional affordability index has been used to administer rules defining who can receive housing subsidies, and used to define public policy governing housing and investment needs, without regard to location. For transportation, policy results based on this index are integrated into travel demand forecasts and traffic impact studies used for long-range planning that in turn tend to prioritize road expansion and congestion management objectives. Yet, decisions on transportation and housing investments do not take into account how these two investments are interrelated, and how the built environment and housing prices will influence a household's transportation demand.

Overcoming Challenges

Based on CNT's analysis, the recommended affordability level for the combined cost of housing and transportation should be 45 percent or less of a household's income, allowing for variations in average housing and transportation costs based on location. By measuring the transportation costs associated with place, the index acts as a more robust policy tool to frame objectives and performance measures aimed at increasing the environmental and economic sustainability and social equity of communities over time.

Now that the tool provides neighborhood-level data for 80 percent of the U.S. population, local jurisdictions are able to screen transportation investments for their direct cost-of-living impacts. The San Francisco Bay Area's Metropolitan Transportation Commission (MTC) and the Chicago Metropolitan Agency for Planning (CMAP) are already using the tool to determine variations in housing and transportation affordability based on location at the neighborhood scale. Local-level data will help define regional objectives aimed at reducing the combined cost of housing and transportation as a share of household income. For example, MTC has committed to a long-range planning performance objective of reducing today's combined costs of housing and transportation for low- and moderately low-income households by 10 percent by 2035. CMAP planners have used the tool's analysis to help the region maximize the benefits of available funding for new transportation projects, while making the most cost-efficient decisions for maintaining existing systems.

CNT's Transportation Model Data Inputs

Source: Center for Neighborhood Technology, 2010.[45]

Outcomes and Results

The H+T Affordability Index can help grantees and agencies channel funds toward more innovative and comprehensive planning centered on providing more mobility choices and reducing the overall cost of living. By using the model's analysis, States and regions can better target and prioritize transportation and housing connections where most needed, and in the process improve mobility choices, reduce the cost of living, and improve quality of life for their residents.

4.3. Conclusion

Policy-based approaches are instrumental in supporting the organizational change needed to implement livability in transportation projects over the long term and more permanently. The case studies have demonstrated that when processes and standards are institutionalized through policies, these have better chances of moving forward while surviving staffing and organizational changes.

- *Policy is tied to an agency's operational reality.* Transportation budgets are not keeping pace with agency costs, and while maintenance costs increase, less funding is available for new infrastructure. Conventional policies mostly address transportation system deficiencies with new infrastructure, especially added roadway capacity. PennDOT has realized that these are competing agendas and cannot be fiscally sustained. It has also acknowledged that the agency cannot build its way to a conventional level of sufficiency given its increasing maintenance obligations. This underscores the importance of developing policies that support cost-effective facility design and affordable transportation choice.
- *Policy changes require strong political support and staff engagement.* PennDOT and WSDOT demonstrate that strong commitment from an agency executive is the most effective way to begin communicating a policy change message. However, it is important for the middle levels of an organization to remain engaged in policy development and refinement as well. Dissemination of new policy initiatives from leadership throughout an organization can be slow and meet with resistance. While not everyone in an agency might be convinced of the benefits of a livable transportation policy framework, enlisting key individuals at strategic points throughout the organization can be an effective strategy. District-level engineers who embrace livable design principles are likely to deliver project results different from their nonengaged counterparts.
- *Policy change requires external partnerships.* The PennDOT, WSDOT, and MDOT case studies show that shifting transportation policy to incorporate land use and community building requires effort and commitment from other partner agencies and stakeholders, not just from the transportation agency leading the change. This change requires early and continuous coordination with localities, MPOs, State and regional agencies, legislators, and other interest groups.
- *Policy change can be facilitated by a supportive organizational structure.* In Charlotte, the policy framework that allowed integrated land use and transit planning to occur was facilitated by an organizational structure that enables partnership across departments to happen naturally. Institutionalizing change is also a strategy that has enabled MDOT and WSDOT's success, as each agency dedicated staff resources to achieving specific livability goals.

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5. Partnership

5.1. Introduction

As a livability principle promoted by the Partnership for Sustainable Communities, coordination and leveraging of policies and investment is fundamental to supporting healthy and economically competitive communities. Within a partnership framework, improving coordination among Federal, State, regional, and local stakeholders can maximize investments across all level of governments, as well as better align policy and program goals.

Partnerships are fundamental in building and maintaining support for transportation projects. Formed across and within government agencies, community organizations, and civic and private sectors, partnerships can be utilized at any time during planning and implementation to help increase and diversify funding opportunities, public support, and technical capabilities to make transportation projects more viable in the short and long terms. Partnerships also help maximize technical and human resources, while expanding the reach and impact of a project throughout decisionmaking.

Through interagency collaboration, HUD, U.S.DOT, and EPA are committed to improving how regions plan for future growth, including fostering livability in transportation projects and programs. This interagency partnership provides a strong foundation for ongoing collaboration between public and private sector partners who are already working together on sustainable transportation planning, overcoming challenges, and promoting livability principles.

This chapter illustrates a range of partnership types that have used innovative coordination strategies to advance common goals consistent with the livability principles. Spanning public, private, and nonprofit interests, these partnerships demonstrate coordination across jurisdictions (interagency) and across divisions and offices within one government entity (interdepartmental). Varying in formality, the partnerships have used a range of collaborative models to meet their funding, policy, or planning goals.

Partners can include:

- *Public sector* – Includes Federal, State, city, and regional agencies and elected officials.
- *Institutional sector* – Includes universities and hospitals.
- *Private sector* – Includes local businesses, land owners, and developers.
- *Community and civic sector* – Includes community-based and neighborhood organizations, and residents.

Roles of partners can include:

- *Federal Government* – The Government can provide funding (e.g., grants, loans), regulatory support, and flexibility in standards throughout transportation planning and implementation. Through the interagency HUD-DOT-EPA

partnership, the Federal Government is poised to further assist communities in leveraging programs and funding through technical assistance or funding opportunities.

- *State government* – At the State level, government agencies administer both State funding and pass-through of Federal funding, and are directly responsible for planning and implementing transportation projects. State agencies can also offer greater flexibility to regional and local partners in meeting planning standards while improving livability through partnerships—both between State entities (transportation, housing, community development, natural resources)—and with regions and localities. State government is also in a position to support voluntary incentive programs to further promote livability in transportation.
- *Regional agencies* – MPOs; Councils of Governments (COGs); transit agencies – Regional agencies provide interagency coordination and facilitation between State and local partners while fulfilling statutory requirements for use of Federal funding (such as TIPs and MTPs). Regions are an appropriate scale for scenario planning and visioning, and are in a strong position to monitor performance measures for implemented projects and programs. Many regional planning organizations also work across housing, environmental, aging, and economic issues, helping to integrate planning and implementation.
- *Local government* – Local governments are often in charge of implementing and overseeing funding for specific transportation projects. Local governments can also play a key role in organizing area-specific funding mechanisms such as TIF. Local governments can lead planning efforts, engage stakeholders, and provide data and technical assistance to transportation efforts. Local governments usually maintain land use authority, and play a key role in establishing appropriate regulatory frameworks to enable PPPs and private land development.
- *Private sector* – The private sector can provide technical knowledge and capital for project implementation, both for land development and public infrastructure. For transportation projects, development and construction entities can leverage and expand business involvement and assist with providing right-of-way (ROW).
- *Community-Based Organizations (CBOs); Nongovernmental Organizations (NGOs); residents* – Community stakeholders are typically the end users of transportation projects and are key partners when defining and prioritizing community visions and neighborhood needs. A true partnership with the community also empowers stakeholders and allows them to own the process and the plan, and consequently inspires them to become champions throughout the project process.

Partnerships among government agencies, such as a State DOT joining with local governments, or among agencies or offices within a government unit, are typically referred to as interagency or interdepartmental partnerships. Collaborative relationships between government and nonprofit entities consist of varying levels of formality, including contractual agreements and ad hoc coalitions, and are equally referred to as partnerships in this chapter's discussion.

In transportation, the term "public-private partnership" refers to coordination among public and for-profit entities, as well as agreements that allow for greater private sector participation in delivery and financing of transportation projects. When incorporating livability in transportation, a PPP can be a more informal effort that involves businesses and developers in the planning and implementation of projects along multimodal corridors, TOD, or building or donating ROW for segments of an interconnected network of local streets.

Partnerships can be used to overcome a number of barriers to incorporating livability into transportation planning and project development activities. At every level of government, the **misalignment of planning and implementation goals** and **financial constraints** have proven to be key challenges that may stall or prevent project implementation and realization of project goals for all stakeholders.

- *Lack of Common Vision, Goals, Policies.* Two primary barriers to incorporating livability into transportation planning and project development are 1) the expansive number of entities that have authority over, or interest in, transportation,

environment, land use, housing, and economic development, which can lead to conflicting or misaligned visions, goals, or needs; and 2) the mismatch in geographic scales at which these entities operate. MPOs play a central role in coordinating, prioritizing, and identifying funding for regional transportation projects, while multiple local authorities carry out land use planning and permitting decisions.[8] Even within a single government, multiple agencies and offices have livability-related missions. Due to lack of coordination, these agencies may find themselves working at cross-purposes or missing opportunities to build off each other's work.

- *Financial Constraints.* Financial constraints are also barriers to broadening the scope of transportation planning and project development to include livability. Even in the best of times, it can be difficult for agencies to find adequate funds for planning or implementation. Expanding the scope or scale of transportation planning and project development activities can be seen as an unaffordable luxury. Another type of financial constraint arises from limitations on how Federal and State planning assistance can be used to address livability needs. For example, a locality may be precluded from using a transportation planning grant to plan for improving water quality or providing affordable housing.

5.2. Case Studies

Maine – Gateway 1

The Gateway 1 case study showcases an interagency partnership that sought to define a common corridor-wide vision. The partnership is currently working through developing and implementing its action plan. As the economic lifeline running through 21 of Maine's Midcoast communities, U.S. Route 1 serves many roles for local residents, municipalities, and the State. Many challenges, including congestion, population growth, and increasing development pressure, that face the scenic 110-mile transportation corridor cross municipal boundaries. Given the breadth of interests potentially impacted by future changes, it was clear to communities in the State's Midcoast, and to MaineDOT and other State and Federal agencies, that planning solutions would need to be identified that could span corridor boundaries.

Overcoming Challenges

MaineDOT initiated a three-phase planning approach aligned with corridor visioning, planning, and implementation. In Phase I, the agency sought to identify the issues and attitudes in the corridor and then reach agreement on the roles and responsibilities of partner entities to include in a Corridor Plan, to be developed in Phase II. In Phase III, the Corridor Plan would be implemented and monitored. The early development of a broad-based, formal partnership framework was integral to the multiphase planning approach; it spanned government agencies and included all 21 communities. The partnership framework was catalyzed by the agency's proactive response to its regional transportation advisory committee's request for a better transportation decisionmaking process to integrate local and regional land use practices along Route 1. The established partnerships, authorized through formal MOUs in 2005, would ultimately guide and coordinate transportation and land use decisions along the corridor.

Outcomes and Results

Based on the strong trust-building and intensive community outreach with corridor communities under Phase 1, MaineDOT developed an MOU with all 21 communities, with FHWA and the State Planning Office (SPO) acting as ex officio members of the Steering Committee. The program included community meetings to introduce project goals, gather communities' perceptions of major corridor issues, and introduce the MOU concept.

[8] Association of Metropolitan Planning Organizations, Noteworthy MPO Practices in Transportation and Land Use Planning Integration (Final Report), April 2004, p. 7, **http://www.ampo.org/assets/library/4_ampotranlanduserptfinal05.pdf**, accessed February 15, 2010.

Sample Page from the Maine Gateway 1 Adopted MOU

EXECUTIVE SUMMARY

PROPOSED MEMORANDUM OF UNDERSTANDING
AMONG TOWNS, MAINEDOT, MAINE STATE PLANNING OFFICE,
AND USE FEDERAL HIGHWAY ADMINISTRATION

for the preparation of a
STRATEGIC TRANSPORTATION-LAND USE
Corridor PRESERVATION PLAN

U.S. ROUTE 1, BRUNSWICK TO STOCKTON SPRINGS

"Whereas" memorials lay out the brief history and rationale for undertaking this Strategic Transportation-Land Use Plan.

Paragraph 1: States the purpose of the MOU, namely, to set forth the process by which the Strategic Plan will be developed. Lists the 20 municipalities in the Corridor.

Paragraph 2: Sets the effective date of the MOU, and the "drop dead" date of July 1, 2005, if at least 15 of the 20 municipalities have not signed the MOU by then.

Paragraph 3: Describes the Phase II public process, including:

A. *A 3-tiered advisory structure (local "Town Response Panels," up to 5 Multi-Town Work Groups, and a Corridor-wide Steering Committee).*

B. *The recipient of the plan, namely a state-federal Policy Group consisting of representatives of MaineDOT, the U.S. Federal Highway Administration, the State Planning Office, and other state agencies whose decisions affect transportation and land use in the Corridor.*

C. *The Steering Committee's first task, namely, reviewing and advising on the scope of services to be carried out in Phase II of the project. An outline of this scope will be attached to the MOU and will set the framework for the review.*

Paragraph 4: Lists the responsibilities of MaineDOT, including its funding, communications, appointments, and Policy Group responsibilities, and committing it to considering adoption of the plan upon its completion.

Paragraph 5: Lists the responsibilities of the municipalities, including constructive cooperation and appointments, and committing it to considering incorporation of the plan into its official documents (such as the local comprehensive plan).

Paragraph 6: Lists of the responsibilities of the U.S. Federal Highway Administration, including a willingness to consider the need to be flexible on standards and regulatory processes as they affect Route 1 and to recognize the contribution of the Strategic Plan toward meeting future requirements under the National Environmental Policy Act and similar laws and regulations.

Paragraph 7: Lists the responsibilities of the State Planning Office, including helping municipalities incorporate recommendations of the project into their local comprehensive plans.

Source: MaineDOT, 2009.[46]

After the Gateway Study Team incorporated community feedback, it developed a draft MOU that defined the project scope and partner roles. With town residents, the team identified key transportation and land use problems in each of the 21 communities. After another round of focus groups and five regionally based public meetings, staff updated the MOU language, began drafting language for each town-specific section, and presented drafts to MaineDOT, FHWA, SPO, and the towns for final review and discussion. In early 2005, the study team presented the final MOU to each community's governing board for approval. As of May 2005, 21 municipalities had agreed to work with MaineDOT to complete a regional, comprehensive land use and transportation plan.

The MOUs documented the purpose of the strategic Corridor Plan, identified the roles and responsibilities of all partners collaborating on the project, established a corridor-wide decisionmaking and public involvement process, and established guidelines for how to identify and address local and regional issues. Partners have agreed on three long-term outcomes for Route 1: 1) moving goods and people safely and smoothly; 2) preserving the scenic, rural qualities along the corridor; and 3) expanding the ability to grow jobs in the corridor. Each MOU is distinct in how the community identified major land use and transportation issues in its area.

In Phase II, the Corridor Coalition collaboratively developed scenarios and strategies to guide planning decisionmaking and better align the partners' goals. Recognizing that transportation and land use decisions in one area can affect the quality of life in another, municipalities adjacent to Route 1 agreed to participate in development of a corridor preservation strategic plan called the Gateway 1 Action Plan. The objective of this jointly developed plan is to anticipate and resolve conflicting goals, and guide State agencies, FHWA, and the municipalities in their corridor management efforts.

The MOUs set the foundation for implementation under Phase III. While the MOUs were essential for defining shared goals and partner roles for the corridor, implementation will require more than a framework establishing a collaborative process.

While Maine municipalities have legal authority to implement corridor plans within their own jurisdictions, they are not able to jointly implement a plan without an interlocal agreement. MaineDOT is currently entering into a cooperative agreement to establish the Gateway 1 Corridor Coalition. Active partners will likely include representatives from Federal, State, and local governments, as well as community residents. Once formed, the coalition will allow public agencies to exercise jointly the powers that each individually possess. It will act as the decisionmaking group identifying and prioritizing local and regional transportation projects along the corridor. The coalition will provide mutual benefits to all partners, bringing the 21 communities into a new relationship with MaineDOT and FHWA. The relationship codifies an authority-sharing agreement between entities that control land use and those that manage the transportation system. By entering into this power-sharing arrangement, MaineDOT will share authority with participating municipalities to set priorities for transportation construction and transit projects. Under Phase III, implementation of the action plan is currently underway.

Lessons Learned

Gateway 1 developed a partnership unprecedented in the corridor and in MaineDOT's history. The agency's willingness to try a different approach by embracing a collaborative process to involve land use partners in transportation decisionmaking proved worthwhile, but somewhat more time consuming in the early stage. Nonetheless, the investment that MaineDOT made, along with the SPO and FHWA, in ensuring that all partners had the opportunity to identify and validate their issues and concerns, and to codify that understanding through a formal agreement committed to by all partners, will have a long-term effect on improving Route 1. As communities and the State work toward achieving shared goals with mutual benefits, a more livable and sustainable corridor is anticipated.

The MOUs provided decisionmakers with a foundation on which to coordinate more closely the local land use decisions with Maine's growth management goals and FHWA's National Highway System

Standards. The goals identified in the MOU will also act as the guiding principles for MaineDOT's capital investment decisions.

Denver, CO—FasTracks

FasTracks has been hailed as a model of regional collaboration that successfully integrated transit modes into a comprehensive region-wide system. As a public infrastructure project and one of the most ambitious transit system expansions in the country, the Regional Transportation District's (RTD) FasTracks program gained broad community support, evidenced by a 2004 region-wide voter-approved sales tax increase of 0.4 percent. Currently, RTD's program to build six new train lines, three rail extensions, and other transit elements by 2017 might be in danger of not being completed due to the economic downturn. Higher costs for construction materials and a drop in sales tax collections have created a $2.45 billion funding shortfall. The need to close this gap has required RTD to reevaluate its financial model to ensure the program's success. The RTD board and local and regional elected officials continue to work as regional partners to identify funding options and make the difficult decisions required to move forward.

Overcoming Challenges

FasTracks is utilizing broad-based funding mechanisms and sources to complete the project on time. At the regional level, RTD is constantly monitoring and analyzing every opportunity to apply for Federal money and help offset the program cost to local taxpayers. Although the district has been considering seeking voter support to double the 0.4 percent sales tax hike, it expects to secure $1 billion in Federal funding for the FasTracks transit network.

Parallel to its more recent efforts to secure public funds, RTD has been successfully drawing on its broader experience with PPPs to identify and secure another $1 billion for construction and operations. The agency has an established record of working closely with private partners. Nearly 50 percent of RTD's bus service is operated by private companies, providing RTD with a strong understanding of the structure of the relationships. In addition, RTD worked with the Colorado Department of Transportation (CDOT) to complete a light rail and highway expansion project along the I–25 corridor—on time and on budget. The project used a design-build partnership framework. RTD expects to draw on these experiences to move forward with utilizing PPPs to implement many of its FasTracks projects.

P3 Project Map

The project plans include the East Corridor, Gold Line, Commuter Rail Maintenance Facility, and the Northwest Corridor Segment. A private group has been selected to design, build, operate, maintain, and partially finance the project.

Source: Regional Transit District, 2010.[47]

Courtesy of RTD

PPPs are typically long-term (30–50 years) contractual agreements involving payments between a public agency and a private partner. Such an agreement would allow a private entity to borrow funds and repay costs over time, enabling RTD to spread out large upfront costs and preserve cash in the early years of FasTracks implementation.

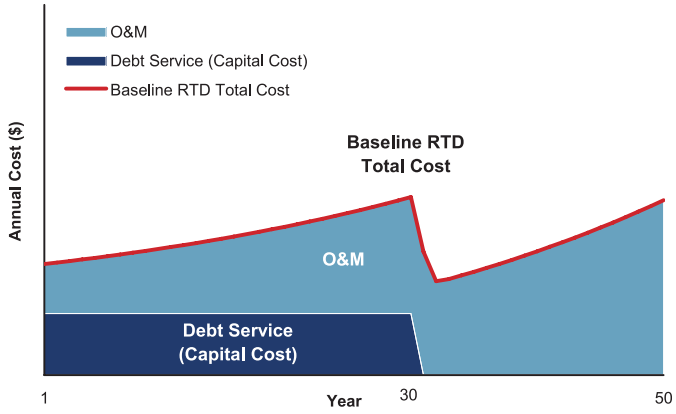
Potential Financial Benefits of a PPP Compared to a Conventional Financing Option

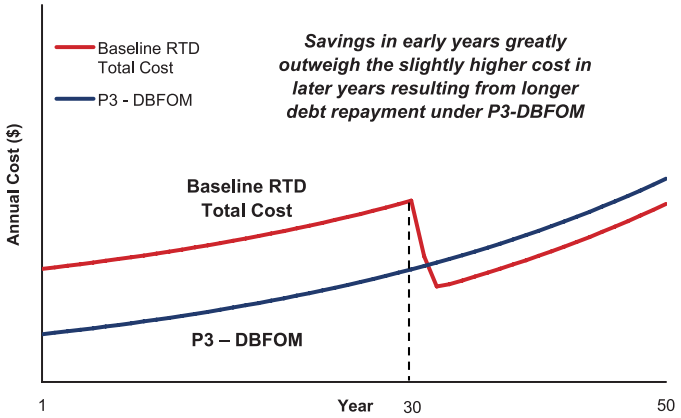
Conventional Financing Model

- RTD controls quality, fares, and service performance standards
- RTD owns Project
- High initial costs stress cash flows
- Financing terms limited by TABOR
- Exposed to rising O&M costs
- Tax-exempt financing utilized

P3 – DBFOM Model

- RTD controls quality, fares, and service performance standards
- RTD owns Project and "leases" to partner for 30-50 years
- Total savings realized over life cycle of project
- Annual P3 lease payment better match RTD's cash flows
- Greater savings realized from lower construction and O&M costs as an integrated project
- Accelerated delivery and financial engineering may also lower costs
- Tax benefits for private partner from depreciation and interest deductions reduce P3 lease payment
- Risk transfer to private partner – construction and operating risks





Source: Regional Transit District, 2008.[48]

Courtesy of RTD

Outcomes and Results

In July 2007, FTA approved RTD's request to be part of the Public-Private Partnership Pilot Program. The approved partnership pilot program includes the Gold Line, East Corridor, Commuter Rail Maintenance Facility, and Northwest Rail to Westminster. Coined the Eagle P3 Project, it is a design-build-finance-operate-maintain contract. In September 2007, the RTD Board approved the partnership delivery method as part of the updated FasTracks Financial Plan. As part of this program, RTD can maximize Federal support through the New Starts program, realize efficiencies and savings in capital operation and maintenance costs, and build and operate projects within RTD's financial capacity. By the summer of 2010, the Board is expected to review and approve the partnership concessionaire; however, this is predicated on completion of Environmental Impact Statements, signed Records of Decision, agreements with railroads on ROW acquisition, Federal approval of the pilot's terms, and New Starts submissions.

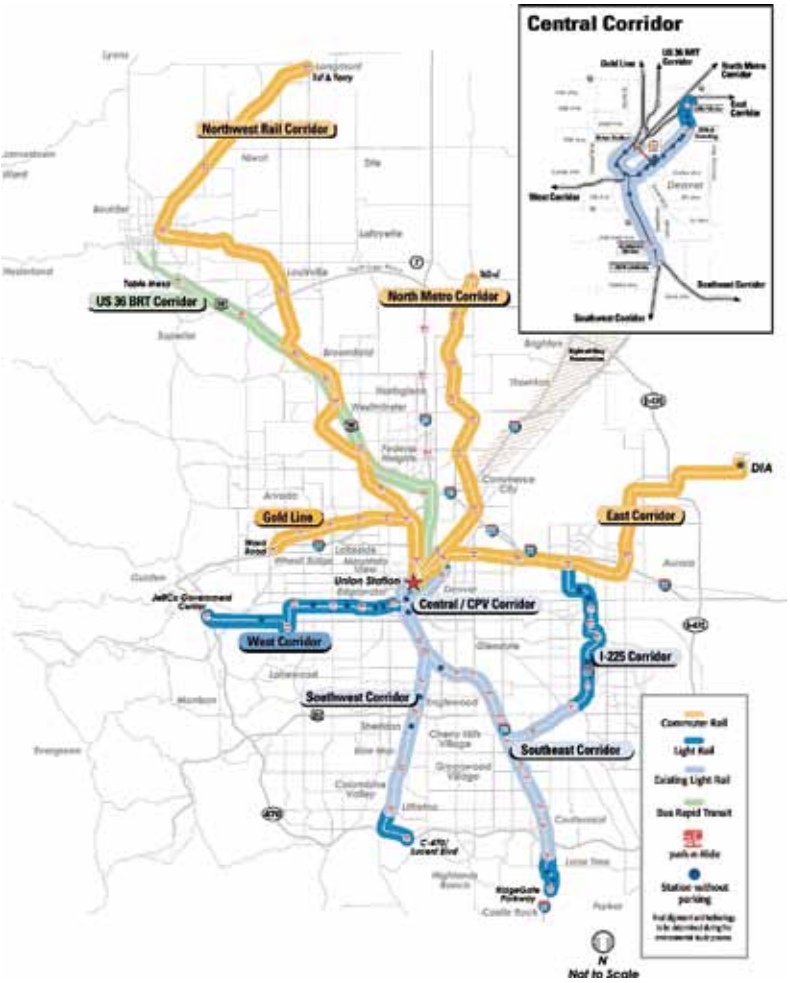
To initiate selection of private partners, RTD retained an alternative financing adviser to establish a competitive bid process. RTD drafted a request for proposals (RFP) defining requirements related to design, construction, operations, and maintenance. RTD has issued the RFP draft to prequalified teams for their review and comment. The district is also reviewing key elements of the RFP with affected stakeholders as well as the Federal agencies that will provide funding and oversight. RTD will retain ownership of all assets, with no sale or privatization of existing assets. RTD will maintain control of construction and operations, including setting design standards, fares,

and schedules, as well as overseeing the look and feel of the project. An in-house management team is expected to oversee performance standards, and if not met, financial penalties will be applied.

Lessons Learned

By utilizing PPPs, RTD expects to lower project cost by reducing construction and overall lifecycle costs. At the same time, RTD expects to transfer certain risks to the private sector, but will make lease payments to the private partner, allowing the district to spread out large upfront costs over a longer period. One of the biggest challenges RTD must overcome is navigating the complex contracting process. The procurement and contracting process requires a detailed project definition and concise outline of project roles, structure, and standards to ensure successful implementation and meeting regional goals, especially now that the project is in jeopardy of exceeding its budget and not meeting the initial schedule. Meanwhile, RTD will need to market the partnership as an attractive investment opportunity that will weather fluctuations in the economy.

FasTracks Project Elements



This map illustrates RTD's major public works program, FasTracks, which includes plans to build six new train lines, three rail extensions, and other transit components.

Source: Regional Transit District, 2010.[49]

Courtesy of RTD

Loudoun County, VA – Route 50 Scenic Byway Rural Traffic Calming

With an expected increase in traffic congestion on U.S. Route 50, a rural highway running through Virginia's Loudoun and Fauquier Counties, VDOT proposed studying a series of bypass and widening solutions. This initial approach to solving growing traffic problems conflicted with the values and expectations of communities that still would be impacted by the growth in traffic along Route 50. Communities feared that a bypass/widening project would reduce safety due to higher traffic speeds, and that added roadway capacity would result in higher traffic volumes. The communities also believed the agency's proposed plan threatened the character of historic main streets, while introducing further suburban development. Nonetheless, due to its policies and administrative processes, VDOT was not initially in a position to respond to the local concerns that would require an alternative design response to integrate transportation and land use solutions.

Overcoming Challenges

Understanding that VDOT was not able to fully participate in an alternative traffic calming approach on Route 50, local citizens moved forward on their own by developing a consortium of local nonprofit organizations. This partnership, called the Route 50 Corridor Coalition, was intended to develop a common vision among residents, businesses, elected leaders, and other interests, whether VDOT participated or not. The coalition's efforts ultimately resulted in plans that would support a more livable Route 50 corridor.

Outcomes and Results

The coalition hired engineering consultants to develop a traffic calming plan for the corridor that was better suited to the vision and stakeholder expectations (see chapter 3). Through this strong local partnership, a traffic calming plan was completed for the towns of Aldie, Middleburg, and Upperville, and adopted in 1997 by the Middleburg Town Council and Loudoun and Fauquier County Board of Supervisors. The coalition successfully secured a special allocation from Congress as a result of its presentation of community benefits that would be achieved through the traffic calming approach.

Plans for Traffic Calming Measures in the Town of Aldie

Source: Fauquier and Loudoun Counties, Virginia, 2003.[50]

VDOT's full involvement came later, once congressional funds had been secured, and the coalition's plan was given to VDOT to use in project implementation. The Commonwealth Transportation Board (CTB) directed VDOT and the coalition to work together through the Route 50 Traffic Calming Task Force. Although the ensuing process was not without challenges, the task force provided a venue for collaboration between the two entities. VDOT was also able to build on the highly participatory nature of the coalition's initial visioning process and continue a similar approach throughout project development. Several VDOT engineers also formed good relationships with community leaders during the design development process.

Lessons Learned

Although the traffic calming plan received widespread community support, including from local officials, VDOT initially resisted the proposed plan as an alternative to the Route 50 bypass project. Because VDOT declined to partner initially with the coalition in the alternative visioning process, there have been obstacles in project implementation due to initial designs not meeting department standards. Nonetheless, Route 50's success story is remarkable in that it brought together community members to agree on, support, and implement one common corridor vision. The grassroots-led traffic calming project catalyzed the community and municipal leaders, and later received dedicated Federal funding that made it the first State traffic calming project for a rural highway.

Although an effective partnership now exists between VDOT and local organizations, partners continue to struggle with technical and financial challenges. Ideally, the coalition would not have proceeded with developing an alternative plan without ensuring VDOT's support earlier in the visioning process. Without the agency's full involvement, the coalition was not able to "ground-truth" its plans early on, which led to some complications later in project delivery. Despite these implementation issues, the coalition developed an innovative plan that attracted broad support from the community, CTB, and Congress.

Charlotte, NC – Integrated Land Use and Transit Plan

Charlotte has spent many years organizing its growth around a vision that combines land use planning with expanded regional mobility options (see

chapters 3 and 5). The city achieved this through an organizational structure and policies that encourage the highest level of partnership among various city departments, as well as between the city and the private sector.

Overcoming Challenges

The successful integration of land use and transit planning was implemented through two key partnership structures: 1) an interdepartmental partnership that aligned different departments to carry out the city's planning efforts, and 2) broader based interagency partnerships and collaboration with the private sector and surrounding communities. The first partnership structure is based on the City of Charlotte's strong tradition of interdepartmental coordination for transportation involving the Departments of Planning, Transportation, and Economic Development, and CATS. Cooperation has resulted in an institutionalized, collaborative structure where planning decisions are made and projects are implemented. This has allowed for greater sharing of budget and technical expertise across departments, as well as reduced expenses associated with administrative procedural efforts. Charlotte's efficient organizational structure has also led to a natural promotion of partnerships across agencies, along with community alliances that have, in turn, supported comprehensive regional visioning and project implementation.

Although this organizational structure increases programmatic alignment, the city's policies continue to make planning efforts efficient and effective. Each year, the City Council establishes five focus areas for targeting community resources: housing and neighborhood development, community safety, transportation and planning, economic development, and environmental issues. Focus area policy goals guide budget and operational decisions, with specific strategies overseen by interdepartmental subcommittees.

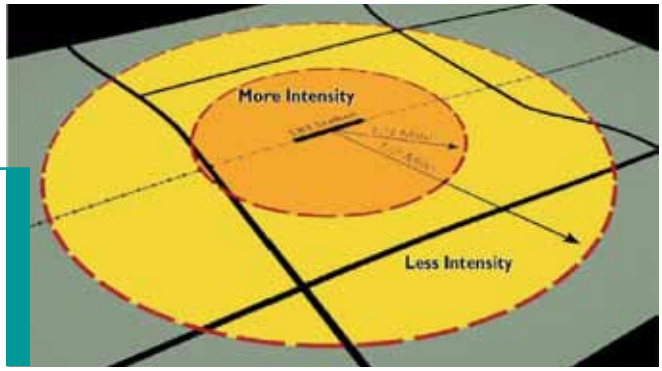
The Charlotte City Council has made increased land use intensity a high priority.

These goals are also incorporated in staff allocation, professional development, and staff review. For instance, the multicorridor transit effort (discussed in chapter 2) was not just a transit project for CATS, but a project to also address economic development and community-building goals.

The second partnership structure is an interagency partnership between MTC and the county (the towns of Davidson, Huntersville, Cornelius, and Matthews), Charlotte, and other partners, who collectively adopted the Transit Station Area Joint Development Principles in 2003. This successfully influenced numerous development projects along future transit lines to become more transit-supportive and, in the process, to better align their transportation goals with community needs.

The joint development principles provide a regulatory framework for public agencies and private developers to follow when developing around station areas. The principles address co-location of public facilities and allow for provision of public infrastructure needed to serve TOD. This framework, established by a strong interagency partnership fostering greater commitment among its partners, has enabled localities' TOD zoning changes to be made as needed to support the transit project. The principles also support development of affordable housing and foster PPPs that provide private sector incentives for TOD and help retain a mix of transit-supportive businesses. Together with the Station Area Plans, the joint development principles have provided guidance for the city's TOD zoning and SCIP.

Land Use Intensity in Charlotte, NC



Source: Charlotte-Mecklenburg Planning Commission, 2001.[51]

Charlotte has also committed to an interagency and PPP model in which it organizes key staff to provide in-house and consultant technical expertise in reviewing development plans. The city's development response program goes beyond the typical approach taken by a local government development review committee (DRC). In the response program, the city uses consultants with planning, urban design, and transportation expertise to help the development applicant meet the city's objectives for the transit corridor and station area planning process. These workshops bring together city staff with property owners interested in developing around station areas to better integrate TOD design into development. The sessions provide a communication forum between city and community interests and developer interests at the early stages of a project when there is the most flexibility for shaping the project. Early collaboration enables stakeholders to identify mutually agreeable solutions that support livability principles.

Impacts of the Response Program on Development

Charlotte's response program assists developers in identifying ways to increase intensity while mixing land uses.

Source: Charlotte-Mecklenburg Planning Commission, 2001.[52]

The process is more design-oriented than a typical DRC process, which tends to list conditions and specific changes that a developer would need to make to have a project approved, but without much grounding in design details and without clear explanation of rationale for the desired changes. In the typical review process, developers do not fully understand the physical impact and benefits of desired changes. However, Charlotte's development response review process is performed collaboratively in a workshop setting, allowing developers to make design changes in real time and understand more quickly and clearly what is expected of them.

Outcomes and Results

As a result of this responsive and more comprehensive review process, the private sector in Charlotte has remained cooperative and supportive of TOD efforts. Several successful development response sessions have reshaped projects to become more supportive of community goals and transit ridership, prior to implementation of the projects. Examples of development response activities include modifying the design and site plan of a Walmart and an IKEA, developing a lower impact and less costly solution to the "weave" at the U.S. 29/NC 49 interchange, and refining the 3030 South Development, a successful TOD built along the LYNX Blue Line.

Lessons Learned

The Charlotte case study illustrates successful integration of land use and transportation planning and decisionmaking, from project design and planning to project implementation. The city's interdepartmental and interagency partnerships have allowed for a comparatively high level of coordination between transportation and land use. The city has proactively developed policies, guidance, and regulations that have helped shape land uses along future transit routes. Because planning, economic development, transportation, and transit are all under the city's purview, the programs and resources of various departments are more easily and closely aligned toward the same community-building goals.

The joint "ownership" of the transit project across various city departments (transit agency, planning, economic development, and transportation) provided a learning opportunity for those involved, broadening each department's perspective. The partnership between agencies helped ensure a strong fit between transportation and other community objectives, which in turn led to more transparent and successful decisionmaking.

Through its development response sessions, the city was able to work through issues related to development density and scale, and implement regulations to protect residential neighborhoods from impacts of TOD. The city has been successful in these efforts because it worked closely with developers to identify

potential conflicts early in the process, offering technical assistance for how to integrate TOD principles into conventional development approaches and establishing buy-in from entities driving on-the-ground land development. The city recognized that a forum facilitating and encouraging communication between the public and private sectors would help ensure that mobility options would be expanded, while fostering economic growth throughout the region.

Albany, NY – Capital District Transportation Committee New Visions Plan

In a region where planners and elected officials have focused on planning proactively for the region's future, CDTC, the MPO for the Albany-Troy-Schenectady, NY, region has forged strong partnerships with the region's communities. Like most regional agencies, the MPO reports to the localities and State partners on its board. In 1993–1997, CDTC carried out extensive public involvement activities to integrate a broad set of community objectives into its long-range transportation plan, New Visions 2015 (now New Visions 2030).

Overcoming Challenges

This was accomplished through extensive public outreach that lasted nearly 3 years, but resulted in a finer alignment of regional goals, local-level planning processes, and community desires and values. Local governments, interest groups, and private organizations throughout the region joined efforts to explore a range of community issues outside the conventional scope of transportation planning, such as environmental protection and preservation of neighborhoods and downtown areas. These collaborative efforts were formalized in a partnership approach called the Linkage program, initiated by CDTC in 2000.

CASE STUDY HIGHLIGHT

Boston's Fairmount Commuter Rail Corridor Redevelopment

One example of how the Sustainable Communities Partnership is achieving meaningful results can be seen in New England. In August 2009, the New England offices of HUD, DOT (FTA), and EPA began to discuss regional partnership opportunities. Still in its formative stage, the effort builds on agencies' experience with past investments and calls for more intentional collaboration in the future for the benefit of communities throughout New England. Each of the partner agencies has made valuable contributions. The agencies will continue to work together, ensuring coordinated development that enhances mobility and accessibility for all residents. The New England partnership is a great example of action taken to support the Sustainable Communities Partnership. Below are a few examples of the contributions agencies have made in support of the core livability principles:

- FTA provided reconstruction funds for two stations along the Fairmount Line. Both stations opened in 2007 and provide a hub for EPA and HUD to target future investments in neighborhoods within easy walking distance. Boston's Fairmount Corridor is a commuter rail line that passes through diverse, predominately lower income urban neighborhoods. Historically, the line has traveled from suburban locations directly into the central business district, bypassing large sections of urban communities. These neighborhoods have endured environmental impacts from the train line without enjoying access to its benefits. Today, work is underway to add four or five new stations along the rail corridor, providing access for the first time to residents in more vulnerable areas.
- EPA is preparing properties for redevelopment through its Brownfields Program, and has funded environmental assessment work at multiple sites within a half mile of one of the newly reconstructed stations.
- HUD and the Boston Redevelopment Authority have produced more than 200 housing units within a half-mile radius of the two newly renovated stations.

The Linkage program provides local technical assistance to develop specific plans (e.g., corridor studies, transit feasibility studies, small sector plans) that reflect the New Visions philosophy. As a planning assistance program, CDTC awards a portion of its FHWA planning funds to local governments under its MPO jurisdiction on a competitive basis. The MPO recognizes the critical role that collaborative and coordinated regional planning plays in achieving regional transportation system goals. To help local governments articulate their planning priorities, CDTC and partner localities use the Linkage program to test planning goals and realistically align LRTP goals with community needs, while also identifying projects for TIP.

New Visions Philosophy Application

The images above illustrate the application of the New Visions philosophy in the form of a complete streets concept.

Source: BFJ Planning, 2008.[53]

Outcomes and Results

Participation in a Linkage study provides municipalities with technical assistance from CDTC staff or consultants for joint planning initiatives to link transportation and land use. Since many small communities have limited technical staff to guide planning decisions, the Linkage program provides technical resources to solve a range of planning issues beyond transportation and introduce sustainable planning principles. Study sponsors have included urban, suburban, and rural municipalities and counties, as well as private, not-for-profit organizations and other public entities. The MPO has helped fund land use plans and visions, highway and transit designs, redevelopment plans, corridor improvement plans, zoning ordinances, and other multijurisdictional planning efforts.

Lessons Learned

Although more LRTPs are being developed collaboratively with more stakeholders, this has not always been common practice. Since passage of Federal transportation legislation in the 1960s, most LRTPs have been very checklist-oriented in defining policy direction, and have relied largely on technical tools such as travel demand forecasting. The beginning of the New Visions effort in 1993, along with the ensuing Linkage program, demonstrated the potential for an integrated, collaborative planning and technical assistance framework. For a relatively small region with little growth, the broad investment of time, funding, and staff resources in an extensive vision process was remarkable and serves as an innovative model that is still applicable to livability planning efforts today.

5.3. Conclusion

The case studies illustrate how various kinds of partnerships have been used to promote livability principles by removing barriers to collaboration and financial constraints. Various partnership structures have been used, from legally binding cooperative agreements, to MOUs, to task forces, to grassroots coalitions bringing together public agencies, private developers and technical experts, to align visions and policies, secure funding, and achieve implementation goals while improving livability.

The new Sustainable Communities Partnership will provide increased support to the partnership structures illustrated in this chapter. The Federal partnership will also likely encourage development

of new partnership structures, formal or informal, among State, regional, and local entities to overcome transportation challenges and promote livability principles, while being responsive to the needs and expectations of a range of stakeholders.

- ***Partnerships created early from the ground up can translate shared visions and goals into realistic projects.*** As Virginia's Route 50 and Maine's Gateway 1 demonstrate, partnerships are far more successful when buy-in and coordination with an implementing agency is established first, allowing for a consensus to be reached on livability principles, which can be incorporated into project design. There is also an enhanced interest in seeing a project through to completion—when community members see their ideas and concerns incorporated into project design, they will likely provide support as projects move forward.
- ***Partnerships help increase agency accountability and responsiveness, facilitating real-time feedback before investments are finalized.*** In Charlotte, Albany, and Maine, partnerships used to fill the gaps in conventional planning helped generate more creative solutions to complex challenges. An interactive process with real-time feedback can increase stakeholder accountability and improve the success of later project development and delivery. Charlotte's development response review process is performed under the city's coordination, allowing developers to make changes in real time and understand more quickly and clearly what is expected and required. Albany's Linkages Program uses collaborative teams to test planning goals and align the LRTP with community needs, while identifying projects for TIP. The MOUs used by Maine's Gateway 1 project guided stakeholder decisionmaking throughout the planning and implementation process, ensuring needs were clearly defined before investments were made.
- ***MPOs are in a strategic position to facilitate partnerships by providing a forum for cooperative decisionmaking among stakeholders.*** Many of the cases discussed included a strong MPO or multilocality role, as well as active State DOT involvement through their roles on MPO policy boards and technical committees. MPOs play a central role in coordinating, prioritizing, and identifying funding for transportation projects. Regional agencies are in a strong position to combine regional land use planning with environmental, housing, and transportation initiatives, and can be effective at building and maintaining ongoing partnerships. Albany's MPO recognized early the critical role that collaborative and coordinated regional planning plays in achieving regional transportation system goals. For almost 20 years, it has been helping local governments articulate their planning priorities by providing them consultant or staff assistance for joint planning initiatives that link transportation and land use.
- ***Public and private sector involvement can broaden stakeholder buy-in, maximize resources, and move projects along more quickly.*** PPPs can clearly identify resources available for planning and implementation (e.g., technical, financial, administrative, operations), and then allocate responsibilities to the party—public or private—best positioned to produce the desired result.
- ***When roles, risks, and rewards are specified, performance incentives and flexibility can help deliver projects quicker.*** The private partner can expand its business opportunities in return for assuming new or expanded responsibilities and risks. Denver's FasTracks was organized to lower initial cost by reducing construction and overall lifecycle costs. While transferring some risks to the private sector, RTD will make lease payments, allowing the agency to spread out large upfront costs over a longer time.
- ***Informal public-private partnerships can also be effective.*** In livability projects integrating transportation and land use, mixed-use and TOD, and interconnected street networks, less complex PPPs can be used to plan and build portions of a complete street network or transit stations. For rural corridors like Route 50, simply linking the adjacent road networks in each neighborhood as development occurs will maximize the capacity of the existing roadway for through travel, while providing multimodal route choice for local travel. Since VDOT owns most local roads, Virginia's new Secondary Street Acceptance Requirements now require developments to provide these linkages to deliver an interconnected, multimodal network.

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6. Design

6.1. Introduction

While visioning, planning, and partnerships can help transportation planners develop integrated solutions that respond to community desires, delivering livability at the project level requires new design approaches. Transportation projects that provide multimodal mobility and support compact mixed-use development patterns must incorporate an overall network approach linked to urban design and a detailed facility design that balances use by all modes. Designing for livability requires understanding who will use the system, including them in the design process, and incorporating their input into final design. Livability-oriented design takes cues from the planning and project development process, and is often explored at the concept level during visioning. Land use plans and policies, community characteristics, and local and regional policy goals can help define transportation facility design priorities.

A well-executed design process can build on early efforts in visioning, planning, and integration of transportation, land use, and housing, bringing them closer to implementation. Conceptual design is often where many of the most creative solutions are developed. Exploring alternative design concepts in the visioning process can help develop broad goals and objectives, while helping participants to understand the challenges and constraints of transportation facility design, engineering, and constructability.

Many of the case studies faced significant challenges posed by existing conventional design guidance and regulations, requiring repeated efforts to get design exceptions. In some cases (Charlotte and PennDOT), the agencies' experience with integrated planning has led to development of new approaches, policies, and standards.

The design phase of a project is where integrated project design can affect project cost and delivery schedule, but is also where innovative design solutions can develop more cost-effective solutions for a phased network approach. The following challenges are often faced by agencies working to apply a more livability-based approach to project design.

- ***Conventional design standards may need exceptions or updates to meet livability goals.*** A transportation agency may want to use an innovative design, but a more conventional design is usually established and codified in policy (and sometimes legislation). The AASHTO Policy on Geometric Design of Highways and Streets (the "Green Book") provides for flexibility in highway design and has been supplemented by other publications that emphasize context sensitive design, but many State agency design manuals are defined more rigidly to produce more uniform project outcomes. The agency can permit an unconventional project through design exceptions, but this can be time-consuming.

- *Roadway functional classifications are associated with designs that are not responsive to context.* Functional classification systems establish a hierarchy of streets based on the levels of vehicular travel expected. Most assume the suburban model of local, collector, and arterial roadways, which does not translate well to walkable downtown and neighborhood networks. Conventional roadway design characteristics, including geometry and speed, are associated with each functional classification, but do not capture the nuances of a roadway's context, nor allow for the idea that a large downtown multiway boulevard might have high capacity, lower speeds, and be enjoyable to walk.
- *Roadway access and mobility need to be balanced with land use context and a roadway's regional role.* Arterial roadways with adjacent commercial land uses may be designed for high vehicular capacity, but local government land use decisions assign adjacent properties commercial zoning to maximize business visibility and property values. This can clog the road with local traffic, reducing through capacity and contributing to safety problems. Some of the new boulevard and network-based approaches have shown that innovative design can re-engineer arterials to improve mobility, capacity, and access.
- *Road widening is controversial in established communities, but new design approaches can provide options.* The conventional response to capacity deficiencies is to widen a road or provide a bypass around it. The additional ROW acquisition impacts adjacent properties while adding to project costs and potential controversy, and frequently reducing economic value and quality of life. New design solutions can address both multimodal transportation capacity and community needs.

The case studies that follow are intended to show how these issues have been addressed in different community contexts.

6.2. Case Studies

Hillsborough Street Improvement Project

Hillsborough Street in Raleigh, NC, served a fundamentally urban, multimodal role in the community but had been assigned a role of moving high volumes of traffic. It is one of a limited number of east-west connections between Raleigh's central business district and Durham and Chapel Hill, its partner cities in the region. This case study demonstrates that community objectives sometimes conflict with a roadway's designation, but that appropriate design can help meet both community and transportation system goals.

As one of Raleigh's main connections to the expressway system, it was attempting to serve the dual roles of business main street and urban thoroughfare; it did not serve either of them very well. Increased vehicular traffic led to the road being widened to a four-lane, undivided cross section. Vehicle conflicts on the four lanes caused traffic flow problems: a left-turning vehicle waiting against oncoming traffic would block the inner travel lane, while a stopping bus would block the outer lane. The focus on vehicle movement compromised bicycle and pedestrian safety, a critical concern in light of the volumes of nonmotorized traffic expected on the main business street adjacent to a major university campus. Although designated for through movement under the State highway system, the corridor's real needs included safely accommodating pedestrian and bicycle movement, incorporating streetscapes favorable to local business, and serving as a public edge to the educational campuses it serves.

Overcoming Challenges

Community and civic stakeholders had long identified the existing street design as a challenge to the corridor's long-term success. In the late 1990s they launched a collaborative effort with the City of Raleigh and the North Carolina Department of Transportation (NCDOT) to begin changing the street's profile to better reflect its role as a main street for North Carolina State University (NCSU).

One of the key organizations in this effort was the Hillsborough Street Partnership (HSP), a coalition of community members, businesses, civic organizations, and students. HSP began developing concepts for streetscape design and traffic calming along Hillsborough Street in 1999 and partnered with the City of Raleigh soon after.

The HSP-led team identified principal concerns, including a high rate of pedestrian-vehicle accidents (four times the average for North Carolina State highways), lack of dedicated bicycle facilities and infrequent use of designated parallel bicycle routes, and problems with traffic flow when commuting and business traffic combined in peak travel hours. With city support, the team conducted a feasibility study to explore design options and test roadway performance using corridor simulations. The city's involvement in a collaborative design process helped bridge the gap between the community-led effort and NCDOT, which retained control over the roadway.

The resulting two-lane road design used roundabouts to preserve traffic capacity, manage intersection congestion, and reduce delay while improving pedestrian crossing safety. At the time of design, Hillsborough Street carried 26,000 cars per day, with higher numbers forecast for the future. The reduction from four to two through lanes added on-street parking, bicycle lanes, and a landscaped median to restrict midblock left turns and provide pedestrian refuge in midblock crossings. Due to the high traffic volumes, roundabouts were used to improve traffic flow while maintaining turning movements. Since the inner travel lane on four-lane roads is frequently blocked due to left turns, the Hillsborough design limits direct left turn access into business driveways. Turning traffic passes its destination, uses a roundabout to make a U-turn, and makes a right turn at the destination.

Due to budget reasons, all the proposed roundabouts were not constructed. Several minor intersections use traffic signals, but the central raised median is replaced with left-turn lanes to preserve movement on the travel lane. At intersections without high levels of delay, modeling demonstrated that signalized intersections could handle traffic, saving funds to improve pedestrian crossings. The roundabouts critical to traffic operations at major intersections were constructed.

Hillsborough Street—Hillsborough-Pullen and Oberlin-Pullen Roundabouts

The roundabouts at the Hillsborough/Pullen (lower left) and Oberlin/Pullen (upper right) intersections reflect the variety of design options available in just this one type of intersection. Higher-volume, multi-lane roadways can still be accommodated with roundabouts through the use of two lanes in the circulating roadway.

Source: City of Raleigh, 2007.[54]

Hillsborough Street Intersection with Turn Lanes

In some cases on Hillsborough, property constraints and project cost led to the continued use of conventional signalized intersections. However, it is still possible to enhance these kinds of intersections to make them more livable: the use of curb extensions (on the upper-left corner of the intersection) and clearly marked crosswalks improve the pedestrian experience.

Source: City of Raleigh, 2007.[55]

The reduction of travel lanes restored space for on-street parking, bicycle lanes, and expanded sidewalks. The on-street parking allows for adjacent

properties to maximize buildable area without needing to add on-site parking and circulation. A key factor was NCDOT's acceptance that the road did not need to serve the same function that its classification might suggest. This was supported by the 2001 feasibility study, which estimated that only around 30 percent of Hillsborough Street traffic was through travel. The construction of Western Boulevard and the extension of Wade Avenue as a limited-access arterial had already provided east-west mobility. While NCDOT maintains jurisdiction over Hillsborough Street, it has accepted that the local function of the road should be a priority, allowing the proposed design.

Outcomes and Results

Construction began in 2009, with completion expected in 2010. The project converts Hillsborough Street to a two-lane, median-divided facility with on-street parking on both sides, a 7-foot-wide raised median, sidewalk bulbouts at intersections and midblock locations, and several pedestrian signals. It also includes replacement of water and sewer utilities and light-emitting diode (LED) street and pedestrian lighting. These increased project costs, but the city had planned to undertake them regardless of any streetscape work on Hillsborough. The original designs featured newly emerging concepts such as roundabouts, pedestrian countdown crossing signals and midblock crossings, which are now regarded as standard practices. The bicycle lanes originally recommended in front of the NCSU campus have been designated as shared-use arrow pavement markings ("sharrows") but are still being considered for bicycle lanes (as of Guidebook publication).

Lessons Learned

Local government involvement is essential to the success of community-led projects, especially when a State agency has jurisdiction over the project. North Carolina retains control over most roadways. Raleigh is North Carolina's capital and second largest city, and NCSU is one of its premier educational institutions. Having a strong base of municipal and institutional support helped advance the project through design and construction.

The project also demonstrates the effectiveness of roundabouts in reducing pedestrian-vehicle conflicts and untangling key operational complications of urban streets. Roundabouts allow free low-speed movement without stopping traffic like signalization, while separating pedestrians from the direct path of turning vehicles. Initial observations suggest that the roundabouts constructed from the original concept plan are meeting traffic flow objectives while greatly improving pedestrian conditions. The Pullen roundabout inside the NCSU campus has performed successfully and without accidents since its construction.

Complete Streets

It's not just about walking. Complete Streets work for everyone. We can restore an age-friendly network of smaller-scale streets as we reinvent suburbia and rebuild downtowns. Our youngest and oldest drivers then can safely move around the community instead of being forced onto those fast-moving five- and seven-lane roads. The same traffic-calming strategies that communities have applied to reduce speed and improve safety in existing neighborhoods can be used to design street networks that 'get it right the first time.' These new designs are called Complete Streets since they work for all users: walkers, bikers, drivers, and transit riders. With narrower lanes (to slow traffic speeds and reduce run-off), safer intersection designs (to reduce crashes and encourage crossing in the right place), curb extensions and median crosswalks (to shorten crossing distances and have a stopping place), bike lanes (to give bikes the same treatment as cars), wider sidewalks and street trees (to make walking a safe, pleasant option), and a host of other details, we can build Complete Street networks that make it easier for everyone to get around: driving, walking, wheeling, or taking transit. A well-planned system of clear, easy-to-read signage will also help us to get where we're going, however we choose to travel.

Growing Smarter, Living Healthier: A Guide to Smart Growth and Active Aging, US EPA, 2009.[56]

Hillsborough Street provides a valuable lesson for urban through corridors in downtowns or adjacent to campuses or activity centers that see high amounts of non-motorized travel. The design accommodates high traffic volumes managing congestion while improving pedestrian access and safety. It also demonstrates that motorized travel in urban environments does not necessarily require higher speed conditions to maintain capacity.

Palm Canyon Drive

Capacity enhancement projects such as roadway widening can generate unintended impacts on adjacent properties, potentially reducing their usability and access. This is one of the greatest sources of controversy over widening projects: They can enhance vehicular mobility, but at the expense of the surrounding community, including creating barriers between neighborhoods. The more a road is oriented to vehicular mobility, the less equipped it is to support walking, wheeling, and transit. Widening projects can also limit feasible land use options, potential for downtown economic revitalization, and quality of life. Roadway widening projects are typically proposed when a transportation agency has determined that traffic on a road exceeds available capacity. For some agencies, policy requires that capacity deficiency problems on a road must be addressed on that road only, especially if it is part of the State system.

Palm Canyon Drive, a primary commercial arterial in Cathedral City, CA, shows how integration of roadway and urban design can incorporate future land use plans and preserve future capacity. The project preserved a five-lane cross section as the principal roadway, while separating on-street parking and business access from through travel with a series of access lanes, using a modified form of the model of European and City Beautiful boulevards.

Overcoming Challenges

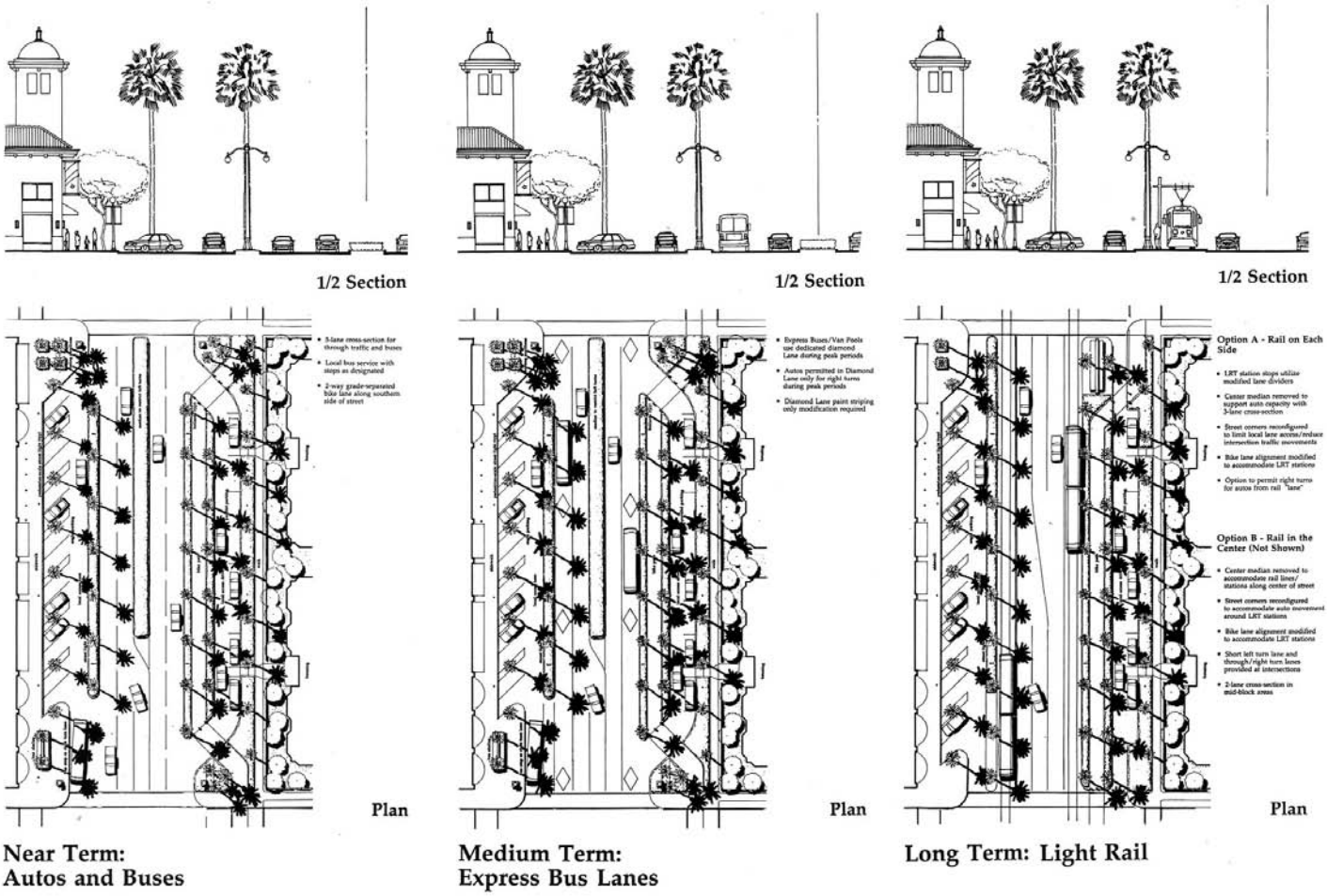
The Palm Canyon Drive reconfiguration began as two distinct planning efforts: redevelopment of downtown Cathedral City and a Caltrans project to add capacity to Palm Canyon Drive (then California Route 111) by widening from five to seven lanes. The City of Cathedral City had retained a consulting team to assist in selection of a new City Hall site. The city team joined discussions about Palm Canyon due partly to local interest in reorienting the town's historic center along Palm Canyon, and partly in resistance to plans for another widening project on Palm Canyon. The historic center had gradually disintegrated due to multiple widenings throughout the middle and late-20th century. The city's primary interest in Palm Canyon was revitalization. Through years of disinvestment that followed property impacts from roadway widening, the corridor had declined in appearance and value, and effectively deterred investment in the neighboring Coachella Valley resort communities of Palm Springs, Palm Desert, Rancho Mirage, and Indian Wells.

Awareness of these two concurrent efforts encouraged their integration, transforming the Highway 111 capacity planning project into a downtown/corridor revitalization project. This sought to address how capacity and multimodal mobility could be reconciled with downtown redevelopment objectives. The new downtown-friendly streetscape separates through movements on Palm Canyon from local travel, business access, pedestrian and bike travel, on-street parking, and transit stops. The boulevard-based streetscape design supports a broader plan for downtown revitalization, including a new City Hall, public safety building, cinema complex, town square, parking structure, and additional downtown retail development.

The project planning and design process resulted in Palm Canyon Drive as a four-lane, median-divided section, with local access streets divided from through lanes by raised medians. The design includes dedicated right- and left-turn pockets, restricted access to select cross streets, and signal timing and other traffic management practices. Few of these design techniques were conventional practice, and most were not permitted under Caltrans design standards. In partnership with the Riverside County Transportation Commission (RCTC), Caltrans agreed to relinquish the segment of Palm Canyon between Cathedral Canyon and Date Palm to the city, and in turn the city would ensure that the county's and Caltrans's traffic through-capacity

targets would be met by the roadway design. The arrangement transferred county and Caltrans funds targeted for widening to the city project as long as traffic performance targets were achieved. The consulting team's innovative approach helped the city understand the traffic operations implications of the boulevard and develop recommendations for roadway design and traffic signal timing to preserve through-movement capacity on Palm Canyon.

Cathedral City—Adaptable Boulevard Design Concept



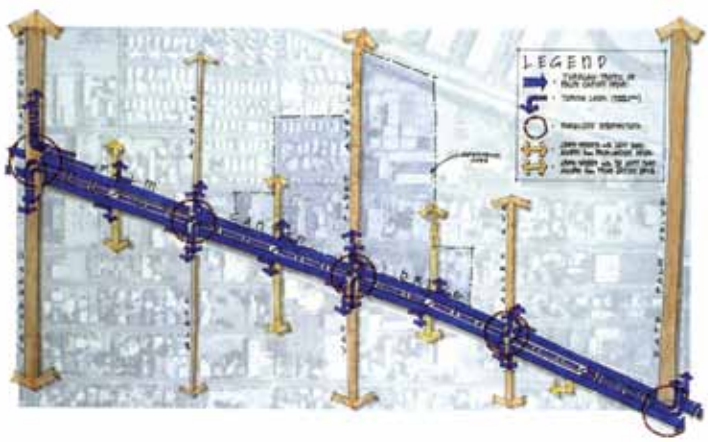
The original intent of the Palm Canyon multi-way boulevard design was to separate local traffic from regional through traffic, thus preserving vehicle-carrying capacity on an important regional road. However, designs for the street incorporated the potential to add premium transit in the future, allowing a degree of flexibility to accommodate changing transportation needs and priorities in the long term.

Source: Freedman Tung and Sasaki Urban Design, 2006.[57]

Outcomes and Results

The original multiway boulevard design concept emphasized a flexible approach based on a range of adjacent development types. Design features such as sidewalks, on-street parking, and transit facility location were chosen based on the land uses desired for different parts of the corridor. Roadway construction included a landscaped center median, two travel lanes in each direction, and an additional landscaped median separating a new angled parking and transit lane from the through lanes. Implementation involved elimination of numerous angular driveways that had compromised traffic operations, and pedestrian-oriented intersection improvements to better connect the two sides of the street.

Cathedral City—Traffic Control Design Concept



Palm Canyon Drive's design sought to balance vehicle mobility needs of a transportation agency with livability needs of the community. To achieve this balance, designers considered the supporting street network and access to it from Palm Canyon.

Source: Freedman Tung Sasaki.[58]

Palm Canyon's reconstruction was completed in 1998, and several of the accompanying downtown projects have also been completed. These include the new IMAX theatre, City Hall, and several mixed-use retail and housing projects. The multiway boulevard has shown notable safety improvements, both for motorists and pedestrians. The city's traffic engineer noted after construction that the road, which averaged 3 pedestrian crashes per year in the mid-1990s, had not had any crashes reported.

Completed Palm Canyon Drive in the late 1990s.

Source: Freedman Tung and Sasaki Urban Design, 2006.[59]

Lessons Learned

Major roads through downtowns and aging suburban strips can be re-engineered in coordination with revitalization plans to improve through capacity, multimodal mobility, business and neighborhood access, environmental sustainability, and other community goals. By following multiway boulevard principles, understanding the context of individual blocks and surrounding development, and separating through travel from local access lanes, both capacity and multimodal choice can be improved.

Palm Canyon Drive also demonstrated the benefits of incorporating redevelopment plans with transportation plans, with interagency cooperation and combined funding yielding an innovative yet practical design. While early projects like this have had to either get design exceptions or required the State DOT turning over the road to local control, emerging design standards and more accepted practices should make it easier to replicate a similar approach elsewhere. The new manual, Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, advances successful use of similar context-sensitive solutions in planning and design of major urban thoroughfares. The manual was developed by the Institute of Transportation Engineers (ITE) and the Congress for the New Urbanism (CNU), and sponsored by FHWA. It provides guidance on how context-sensitive design principles and techniques can be applied where community objectives support new urbanism and smart growth, walkable, connected neighborhoods, mixed land uses, and easy access for pedestrians and bicyclists.

BRT and Transit as a Design Choice—EmX Green Line Project

The importance of multimodal roadway design is evident in the EmX Green Line BRT project. The project's main objectives included supporting existing and planned land use patterns, and providing for the transit line to grow in response to community demand. In making the final planning decisions and transit system selection, Lane Transit District (LTD) focused on the transit service's compatibility with the existing roadway, quality of life, and community scale. The stations were designed to be aesthetically pleasing to residents, complement the surrounding landscape, and provide shelter for waiting patrons. Oregon's One Percent for Art Program provided funding for station art created by community artists. The seamless integration of the final project with the existing community context reflects strong public involvement in the planning and design process.

EmX Green Line Project—Public Art

Source: Lane Transit District, 2007.[60]

Chattanooga Riverfront Parkway

In many urban areas, past design decisions have produced a roadway that is incompatible with contemporary social and economic conditions, land use, and development context. Application of highway-oriented design standards in downtowns can leave roads overbuilt for current capacity needs, with speeds that are incompatible with urban areas. Transportation agencies are reluctant to relinquish system capacity and control, and allocation of scarce project resources to rebuilding a road with no capacity gain can be difficult to defend. As a result, overbuilt roads remain in urban areas, even when their traffic benefits are outweighed by the lost opportunities for community building.

In Chattanooga, TN, one such roadway provides a powerful example of how this seeming incompatibility was addressed. The conversion of Riverfront Parkway from a four-lane, limited- access expressway to an urban surface street played a key role in fulfilling a long-term vision for transformation of Chattanooga's downtown. It is also an example of how roadway function can change over time and how project design needs to address such a change.

For decades, Riverfront Parkway provided easy travel through the center of the city, primarily for freight traffic. The limited-access highway responded to needs of the 1960s and 1970s, but Chattanooga had changed as a community by 2000. An overall decline in industrial output and activity eliminated the previously forecast growth in truck traffic volumes. Several properties along the parkway were beginning to redevelop into commercial uses and civic destinations, adding population and visitors to parts of central Chattanooga that had been occupied by industrial uses. This shift in the city's economic geography left the parkway as the central spine of the waterfront, serving multiple visitor destinations. This highlighted the need to reconsider the road's balance of access and mobility, including improved access to and from downtown, since there was only one direct downtown access point. Travel lanes were divided by concrete barriers and flanked by guardrails and fences, designed for high-speed movement and truck traffic, and limited crossing by vehicles and pedestrians wanting to reach riverfront destinations.

Chattanooga Riverfront Parkway

The Riverfront Parkway was originally a four-lane expressway with one signalized access point to downtown Chattanooga.

Source: Glatting Jackson Kercher Anglin, 2000.[61]

Construction of Ross's Landing Park, the Tennessee Aquarium, and several other riverfront improvements emphasized the need to make the riverfront accessible to pedestrians from downtown, which was prevented by the limited-access nature of Riverfront Parkway. Since the parkway was a major link in and out of downtown Chattanooga, under control of the Tennessee Department of Transportation (TDOT), its ultimate design was not completely within the control of the City of Chattanooga.

Overcoming Challenges

The City of Chattanooga and RiverCity Partners, a private, not-for-profit organization, commissioned a consulting team to develop an integrated transportation-land use design for Riverfront Parkway. Downtown development efforts were predicated on east-west improvements to regional capacity that could be achieved by making the parkway more accessible from downtown, so the design focused on this as well as improving pedestrian and local vehicle trip access to riverfront destinations. This included identifying places where downtown access could be enhanced by adding intersections, leading to a new design for Riverfront Parkway that turned it into more of an urban surface street.

Three primary objectives guided the design:

1. Better vehicular and pedestrian connections to downtown,
2. Better accommodations for a broad range of users and a design that supports quality urbanism along the riverfront, and
3. Capacity (in terms of number of travel lanes) that better matches expected traffic volumes.

The last point reflects the general understanding among city and community leaders that Riverfront Parkway's original design goals were based on a different economic role for the city and its downtown.

The project focused on converting Riverfront Parkway to an at-grade street with four added downtown intersections. A portion of the street was designed as a two-lane section with widened sidewalks and enhanced landscaping, with the remainder a four-lane, median-divided street with similar features.

Chattanooga Riverfront Parkway—Map of Changes

Recommended changes to Riverfront Parkway included the addition of access to downtown Chattanooga through new at-grade intersections and, in some places, the reduction of roadway width from four to two lanes. Designers made a case that the use of network preserved overall system capacity but that the re-design of the Parkway restored riverfront access from downtown.

Source: Glatting Jackson Kercher Anglin, 2001.[62]

The additional intersections were intended to improve traffic operations by distributing entering (westbound) traffic into downtown at more intersections, reducing pressure on the Riverfront/Chestnut intersection at downtown's western end. This assumed that volumes would gradually decrease from east to west, as more traffic would use these new intersections to access downtown. The reduced volumes enabled a reduction in width to two lanes in the most critical areas of pedestrian travel, in front of the Tennessee Aquarium and Ross's Landing Park. Since pedestrian access from downtown to the riverfront was always seen as a key issue in Chattanooga's Vision 2000 goals, stakeholders in downtown planning and vision implementation agreed to pursue a more pedestrian-friendly cross section with midblock crossing access.

**Chattanooga Riverfront Parkway—
Concept Sketch for Riverfront Parkway Street Design**

Source: Glatting Jackson Kercher Anglin, 2001.[63]

Chattanooga Riverfront Parkway Today

Photo Credit: Glatting Jackson Kercher Anglin.
Source: City of Seattle, 2007.[64]

Outcomes and Results

TDOT was not originally supportive of the city's vision and design proposal, and was not willing to advance the project despite ongoing efforts to find a workable solution. Chattanooga, with strong local leadership from then-Mayor Bob Corker, worked with State legislators and the Governor to have ownership and maintenance responsibility of the road transferred from the State to the city, effectively circumventing TDOT's opposition and allowing the city to proceed with construction. The completed Riverfront Parkway has improved downtown access, allowing more direct commuting patterns and renewing economic viability for the eastern portion of downtown. The project also realized Chattanooga's desired connection to the Tennessee River. Reduction of the roadway footprint created space for a pedestrian path connecting the Tennessee Aquarium with Ross's Landing, as well as access to public entertainment-oriented spaces stepping down to the river's edge.

Lessons Learned

As with Palm Canyon Drive, the redesign of Riverfront Parkway was only achieved when the State DOT agreed to cede control of the road to the city. In this case, however, this was accomplished only when the Governor of Tennessee directed TDOT to relinquish control. This required strong leadership, but it also shifted the burden of funding entirely to the city. The city successfully met this challenge through a complex PPP and the dedication of revenue from a tax on lodging, and sees this project as helping to generate economic development benefits.

Highways like Riverfront Parkway are common in urban areas throughout the United States. As cities and towns strengthen their focus on quality of life and the economic development potential that it creates, adapting mobility-oriented infrastructure to a more flexible, multimodal design that supports community livability will become more accepted. The Riverfront Parkway design approach most easily reproduced is the use of an existing street network to assist in traffic distribution. Urban expressways were either built as new roadway alignments or as replacements of pre-existing streets, and intersections with local streets were closed or limited. The primary downtown access from Riverfront Parkway was focused at one signalized intersection, with expressway traffic shifting to local downtown traffic at a single point. By restoring an urban street grid with multiple access points, the new design was able to maintain through-traffic flow while improving vehicle and pedestrian access to downtown and the riverfront.

CASE STUDY HIGHLIGHT

Charlotte Urban Street Design Guidelines

To better facilitate the connections between land use and transit called for in its Centers, Corridors and Wedges Plan, the City of Charlotte developed and adopted a set of street planning and design standards that allow complete streets—streets that provide mobility for motorists while also providing safe and comfortable pedestrian and bicycle travel. With this tool, Charlotte is using street design to shape its development patterns and provide residents and visitors with viable choices for how they move about the city. In the process, it is working to ensure that its broader, jurisdiction-wide livability goals are integrated at the fine-grain level of local street design. The guidelines include innovative policies, implementation processes, and a context-driven set of standards. Some of the policies include recommending street network block dimensions for new development to promote connectivity, use of wide landscaping strips to enhance the pedestrian environment and improve aesthetics, and guidance on improving crosswalks and traffic signal timing to better accommodate pedestrians.

The city has since applied the guidelines to more than 20 streets and 10 intersections, including 7 road diets, where excess vehicle capacity on a street was better matched to actual travel demand through lane width reductions and conversion of unneeded travel lanes to bicycle or pedestrian space. The guidelines have facilitated the increase in Charlotte's bicycle lane network from 1 mile in 2000 to more than 55 miles in 2009. The City Council adopted the Urban Street Design Guidelines (USDG) in October 2007. The USDG received the 2009 EPA National Smart Growth Award and is widely regarded as a model for expanding conventional thinking to context-based street design that considers multimodal travel, infrastructure, green space, and neighborhood and business impacts.

Route 50

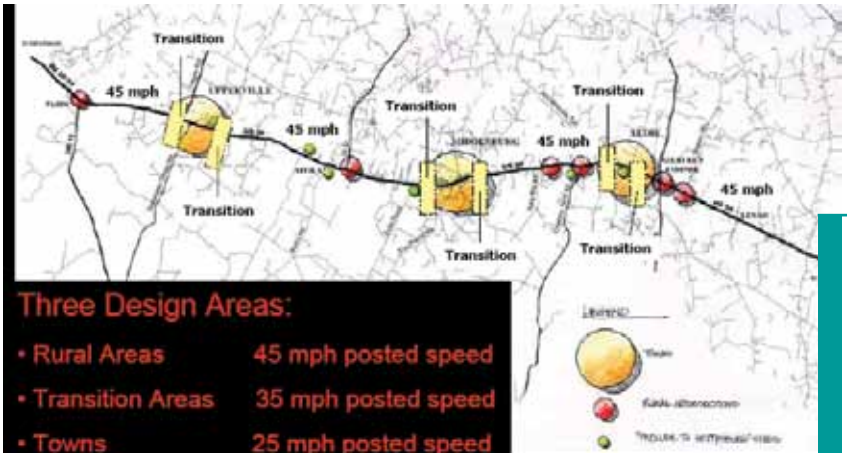
Roadway capacity and safety projects can be just as controversial in rural areas and small towns, typically in the form of either widening or bypass projects. Both approaches are seen by many residents and businesses as threatening community character and small-town economic vitality. Transportation agencies may understand this but are often bound by existing policies to preserve functional LOS along the road. U.S. Route 50 is one example of how a different approach to rural roadway improvements using a broader range of design tools preserved roadway function and performance within the context of a rural and small-town environment.

In the mid-1990s, VDOT began to discuss a potential bypass for U.S. Route 50 in Loudoun and Fauquier Counties around the towns of Middleburg and Aldie, as well as potential widening projects. Community residents opposed the concepts because of perceived impact on the corridor's character and the potential to invite further suburban development. However, they also understood the commuting patterns in the corridor and recognized the need to address the safety and congestion problems brought by increased traffic.

Overcoming Challenges

To address these issues, the Route 50 communities formed the Route 50 Corridor Coalition, and hired engineering consultants to develop a corridor traffic calming plan. The plan focused on maintaining the character of existing two-lane sections where possible, while improving capacity, safety, and multimodal connections in the small towns and hamlets. The plan introduced a more sophisticated array of design treatments to manage the motorist's transition from rural to town sections, and included using vernacular design materials and attention to contextual detail.

Route 50 Design Context Zones



The VA Route 50 Traffic Calming Plan includes design context zones and transitions from rural highway to towns.

Source: Fauquier and Loudoun Counties, Virginia, 2003.[65]

Design tools included a transition from open shoulders to curb-and-gutter roadways, to slow traffic entering the towns. Within the town contexts, sidewalks, raised medians, and midblock pedestrian crossings helped raise motorist awareness of pedestrians and further slow traffic. In purely rural contexts, the wide shoulder was replaced with a stabilized turf shoulder that would support vehicles leaving the road but also provide a more aesthetic transition to the surrounding rural context. Roundabouts were used to address traffic congestion and safety at key intersections such as Route 50 and Route 15 at Gilberts Corner. The use of roundabouts prevented excess widening typically required for turn lanes at conventional intersections and improved traffic flow and safety while reducing speeds. Instead of focusing traffic movements on a single intersection, the Gilberts Corner design added three roundabouts: one at the primary intersection point of Routes 15 and 50, and two others connecting a new roadway between these roads that accommodated movements between the south and east directions.

Outcomes and Results

The traffic calming plan was adopted by the Middleburg Town Council and the Loudoun and Fauquier County Board of Supervisors in 1997, and was recognized by the ITE President's Award for Excellence. The following year, Virginia Senator John Warner secured $13 million in congressional funding for the traffic calming demonstration project under the Federal TEA-21 transportation bill. In 2000, a second round of planning and design began with VDOT and the Route 50 Corridor Coalition working together in the Route 50 Traffic Calming Task Force. The Task Force is responsible for overseeing the plan's implementation as it goes through project development, final design, and construction. A design memorandum was produced in 2003, followed by full construction design documents. Project construction began in 2007, with various elements of the project completed and some underway.

Gilberts Corner Roundabouts

Along VA Route 50, the Gilberts Corner roundabout plan accommodates substantial turning movements between Route 50 and Route 15 by adding a new diagonal connecting road with additional roundabouts.

Source: Virginia DOT, 2008.[66]

Photo Credit: Ginny Finley, Vanasse Hangen Brustlin, Inc.

Lessons Learned

This was the first time that VDOT applied traffic calming to a primary State highway. On the scale of a 20-mile corridor, the project has faced complications from design exception processes, costs, and drainage. Implementation proved to be more complex and time- and resource-intensive than anticipated, which in turn delayed the overall project implementation schedule. Many of the conceptual design tools were not typically used in VDOT's roadway design projects, and proved challenging during design development. Challenges to constructability of some initial concepts might have benefited from greater design expertise. Several design concepts were not allowed by VDOT standards. These had to go through the design exception process for approval, requiring approval above the district VDOT office responsible for project management and construction (adding significant delay). Route 50's location in a mostly rural area limited availability of alternative detour routes, leading to added costs for maintenance of traffic operations.

Through anecdotal accounts, the new design has significantly altered the behavior of drivers along the Upperville portion of Route 50, and at Gilberts Corner, the intersection of Routes 50 and 15 and historically the source of greatest travel delay along the 50 corridor. Fewer cases of acute congestion are observed at the new roundabouts at Gilberts Corner compared to the previous signalized intersection (at this writing, VDOT planned to conduct more formal studies to measure the effect of the traffic calming measures).

Positive outcomes have also occurred in the form of structural and institutional change, though this has not yet occurred on a scale to enable such a project without special review. VDOT has adopted the AASHTO Policy on Geometric Design of Highways and Streets as its standard design guidance, and has created a process where projects not compliant with VDOT standards but falling within AASHTO's suggested parameters can qualify for a design waiver at the district office level (and thus do not have to seek a formal design exception from the chief engineer at the central VDOT office).

CASE STUDY—ROUNDABOUTS

Roundabouts: Improved Safety, Capacity, Mobility, and Placemaking

Roundabouts have emerged as a design tool that meets the seemingly competing objectives of improved traffic flow through busy intersections, traffic calming, vehicular and pedestrian safety, and economic revitalization. Long used in the United Kingdom and other Commonwealth countries as an alternative to signalizing intersections, they have seen relatively recent adoption in the United States and are gaining increased acceptance for intersection control.

From a livability perspective, roundabouts offer several key benefits: they manage queuing and congestion at intersections by allowing simultaneous operation of some crossing movements; they break potential vehicle-pedestrian conflicts into two discrete points by use of their splitter islands; and they slow traffic moving through the intersection, while increasing capacity. They offer greater safety, eliminating the potential for head-on collisions and focusing drivers' attention on the roadway ahead, and toward other cars and pedestrians. Although they require construction and adjustments to existing geometry of the intersecting roadways, they offer safety and operational benefits that make them work more effectively than traffic signals by most measures.

One-lane roundabouts are appropriate for smaller, lower-volume roads with single-lane approaches. Larger two-lane roundabouts can handle higher volumes. While roundabouts provide significant benefits over signalized intersections, most intersections could be built with signals instead of roundabouts, although with less capacity, safety, and more delay. The signalized intersections would also typically require wider roads than roundabouts, to allow for added lanes to stack vehicles waiting to turn.

Woodrow Wilson Bridge

Another challenge that agencies face is incorporating facilities for walking and wheeling on major highways functionally designated and designed primarily for automobile and truck use. The Woodrow Wilson Bridge carrying I–95 and I–495 (the Capital Beltway) over the Potomac River south of Washington, DC, is one example of how multimodal project planning can be incorporated into large-scale highway facilities. Interstates and other limited-access, high-speed roadways are not typically focused on accommodating multimodal, nonmotorized use. An increase in regional demand for walking and biking, combined with limited Potomac River crossings, underscored a unique opportunity to pursue these improvements in reconstruction of the bridge.

Overcoming Challenges

Initially designed to carry 75,000 vehicles per day, the old bridge had traffic volumes of 195,000 vehicles per day by 2004. Consequently, heavy traffic congestion and major delays became daily occurrences, leading to regional demands for a new and larger bridge. Excessive traffic loading also took a toll, accelerating deterioration and raising safety concerns. As planning for redesign and reconstruction of the bridge began, stakeholders expressed a need for this critical connection—the only Potomac crossing south of downtown Washington within the metropolitan area—to include potential carrying capacity for expanded transit and nonmotorized travel.

When planning for the bridge began in the late 1980s, FHWA maintained the following four objectives for the project:

1. To provide adequate capacity for existing and future travel demand by improving operating conditions and fixing the bottleneck caused by eight Capital Beltway through-lanes converging into six lanes across the river;
2. To facilitate intermodal travel, such as transit or HOV lanes, walking, bicycling, and maritime access up the Potomac River;
3. To improve safety by reducing the number of accidents and improving access for emergency response vehicles; and
4. To protect and improve the character of the surrounding environment.

With these in mind, design focused on increasing vehicle capacity as well as providing a separate envelope for walking and wheeling. Significant challenges existed, such as negotiating complex agreements between VDOT, MDOT, and FHWA; lawsuits filed by condo owners; and opposition from the City of Alexandria. MDOT and its State Highway Administration sponsored a design competition that led to several ideas ultimately integrated into project design. After a series of revisions from a contentious environmental review and NEPA compliance process, with four separate review panels to ensure that the design fit appropriately within its environmental context, FHWA finalized the bridge design in late 1999. This included 12 lanes of vehicular traffic with a separate bicycle-pedestrian trail component on the northern side of the bridge span connecting to the Mount Vernon Trail in Virginia and Potomac Heritage Trail in Maryland. The 12 vehicular lanes are configured with 6 per direction: 3 per direction used for local traffic, 2 per direction for express traffic, and 1 per direction for HOV and bus traffic.

Outcomes and Results

The new bridge opened to traffic in 2006, with the bicycle and pedestrian path on the northern side of the bridge span opening in 2009. The trail design also included bridge crossings over the vehicle lanes at each end, so pedestrians and bicyclists can safely cross the bridge.

Lessons Learned

Although the bridge itself provides excellent multimodal facilities and connects to trails on both sides, bicycle advocacy groups have been critical about the limited bicycle network on the Maryland side. This highlights the need to implement complete streets and networks approaches in all projects, so that users of all modes can access the same destinations. Although there are no current plans for such facilities, the

width and load-bearing capacity of the bridge were designed to accommodate future heavy rail transit.

6.3. Conclusion

In many ways, design-based approaches begin to emerge when a transportation agency has already embraced livability concepts, and learned through visioning, planning, and policy how best to apply them at the institutional level. The case studies demonstrate that certain design tools and techniques can carry this agency commitment to the project level. In some cases, such as Hillsborough Street, transportation agencies have been proactive partners with the communities they serve, expanding their thinking beyond conventional highway planning to understand the benefits of a livability approach. These cases demonstrate the benefits and necessity of designing transportation projects with livability in mind, understanding that the design stage is where many of the human-scale factors of livability are incorporated.

Many early creative projects were not done within the typical institutional parameters of transportation agencies. Their supporters sidestepped agency-based limitations, either by removing a project from the State agency's purview or involving other political leaders. These case studies did not proceed through a conventional, transportation agency-led project development process, but were initiated through community interest in promoting livability.

- ***Design is where the agency's approach to livability becomes most visible to communities.*** Agencies that successfully incorporate livability are able to improve a project's design while maintaining the original transportation-related goals. Although some communities may see other livability goals as their highest priority, the cooperation of transportation agencies with jurisdiction over infrastructure projects is essential to making an innovative project happen, and for it to become a model approach. The case studies identify several techniques that balance a community's livability objectives with a transportation agency's traditional mission of mobility of people and goods. These can all be adopted by other State transportation agencies in project development and even by MPOs as a policy guideline for how to tie projects to broader community needs. They include:
  - ***Roundabout intersections***, which improve pedestrian crossing conditions, control speeds, enhance aesthetics, and move traffic safely and efficiently;
  - ***Enhanced local street networks***, which can help distribute traffic and separate the burden of carrying regional and local trips that many arterials face;
  - ***Multiway boulevards as an access management approach***, allowing access to local properties and parking to be separated from the principal roadway, leaving them to accommodate through traffic more safely and efficiently; and
  - ***Space for non-motorized users in the roadway envelope***, allowing sometimes-critical connections to larger bicycle and pedestrian systems.
- ***Increasingly, livable transportation projects are what communities want.*** Increasing community interest suggests that livability will continue to be a goal of communities and local governments. It also suggests that design flexibility should be incorporated into the project delivery process. Livability-oriented transportation projects should not be seen as exceptions to the rules, but rather as an increasingly common application of flexibility in project design.
- ***Design-based approaches to livability start with early agency-community dialogue.*** Early agency involvement in visioning and conceptual design can better incorporate livability principles into project-level design. By participating in an agency's design process, community partners can understand what is possible within reasonable cost and engineering parameters. Projects developed outside transportation agencies' standard process may need to rely on administrative changes, process modifications, and sometimes executive action to move forward, and the disconnect between community expectations and agency constraints can lead to frustration and even failed attempts at project delivery. Integrating livability is much easier when administrative issues are anticipated and overcome in advance of implementation.

- *Design-based approaches rely on creativity and astute project management.* In each of the community-led visions, the project was supported by planning and engineering consultants familiar with agency operating procedures as well as innovative design approaches. Creative and knowledgeable support is crucial, whether from consultants or government staff, because it can inspire support and keep community expectations at reasonable levels. Early identification of design features likely to require exceptions can help identify concerns of the responsible transportation agency, leading to workable solutions.

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7. Implementation and Funding

7.1. Inroduction

Implementation and funding issues can pose some of the biggest hurdles to aligning transportation projects with livability goals. Growing budget constraints have forced transportation agencies to explore alternative funding sources, while still following multiple funding and regulatory criteria for planning and project selection. Planning and transportation agencies have usually focused largely on vehicular mobility and capacity when allocating project funds. As many of the case studies demonstrate, aligning transportation investments with community livability goals can improve transportation system performance and coordinate additional public and private investment.

In a climate of severe budget constraints, a practical set of phased infrastructure improvements coordinated with local land development decisions can maximize the effectiveness of existing transportation investments. Many regional scenario planning studies have compared the impacts and costs of continued dispersed development against a strategy of infill and compact growth around existing town centers. Compact, village-scaled development patterns can have far less impact on fields, forest, farmland, air, and water quality, while reducing project costs. A balanced, multimodal transportation network can 1) improve connections throughout the region; 2) improve mobility within neighborhoods, towns, and counties; and 3) increase transportation choices that foster livable communities.

Several approaches can be used to achieve these goals:

- Getting the regional vision and State policies aligned with livability principles
- Using corridor and area plan-level strategies to identify multimodal networks
- Using project-level and operational strategies to develop cost-effective improvements
- Developing innovative, realistic funding strategies with partners

As livability principles are incorporated into transportation project implementation, the most successful examples will include new policies at the State, regional, and local levels; strong public, private, and community partnerships; innovative multimodal designs; and innovation in building, operating, and maintaining the system. As State and regional agencies adjust their project selection and funding criteria to meet broad community livability goals, they will want to be met halfway with commitments from local partners that transportation investments will be sustainable and supported by local land use regulations, infrastructure investments, and ongoing operational and access management decisions.

7.2. State and Regional Strategies

Achieving livability in transportation can start with identifying and analyzing quality-of-life issues by considering a range of elements at the regional or State policy level:

- ***How will the residents live?*** In what types of communities do we want to live and work 50 years from now? Where will the jobs be and how do we get there?
- ***Where will residents live?*** What areas in the region are suitable for urban and village-scaled development, and what areas are off-limits?
- ***How will the community get there?*** What steps are needed to move the region from where it is now to the desired types of communities and growth patterns?

Many communities have done this through vision-based planning approaches. Detailed scenario modeling and analysis of costs and benefits demonstrate the cost-effectiveness of integrating transportation with land use (usually for more compact development to support mode choice). This scenario analysis at a regional scale, including surrounding rural areas, typically helps identify appropriate locations for transit-supportive growth around existing rural towns and villages. It also underscores the effectiveness of strategies to use limited public funds to connect the dots of private investment in local and neighborhood roadways.

Implementation strategies at the regional and local plan levels typically include:

- Linking cities and suburban corridors, growing rural counties, and small towns with a complete street network and targeted transit improvements;
- Re-engineering existing roadways to improve vehicle capacity; pedestrian, bike, and transit service; and requiring new facilities to be complete streets;
- Developing a multimodal network of parallel roadways through existing underused shopping centers and strip commercial development, for local travel and to connect surrounding neighborhoods to jobs, shopping, activities, and each other; and
- Identifying operational and access management improvements to roadways—to improve throughput and local travel, safety, business access, and transit operations.

Implementing regional strategies requires reinforcing actions at the corridor, area, and project levels, supportive State policies, and matching funding to specific strategies. All the case studies promote this regional approach. The Gateway Route 1 Corridor Coalition will implement many of these actions at the appropriate level. Gateway Route 1 also demonstrates an effective regional visioning and public involvement process to promote livability by leveraging traditional transportation funds. These funds helped develop an integrated transportation, land use, and environmental plan across a 110-mile rural corridor. The Community-Centered Corridor Plan helps link several different types of small towns and rural areas while protecting their character. MaineDOT has committed to new roadway standards for maintenance and upgrade to match the regional vision. The communities have agreed to support implementation of the parallel network through updates in their comprehensive plans and in development review. The State and localities have also agreed to coordinate operations and access management decisions to improve throughput and safety along the corridor.

In many cases, it is important to have a receptive regulatory atmosphere for projects to be implemented. While local governments have a big role to play since they have control over land use regulations, an updated regulatory environment and supportive State policies will help align transportation projects with livability goals. This can include reduced parking requirements, acceptance of alternative performance measures, complete streets standards, multimodal LOS, and encouragement of appropriate land use development forms as a response to transportation investment.

State-level policy changes are effective implementation tools, as demonstrated by PennDOT's Smart Transportation Guidebook. The smart transportation principles emphasize overall project cost in decisionmaking, a need to respond to project context, and considering value-to-price ratio as a reason to

select and develop a project. PennDOT developed the guiding principles to direct agency resources, then created a flexible design guidebook (in partnership with NJDOT) to enable projects to be planned, designed, and constructed to be consistent with the agency's guiding principles, including tailoring solutions to the context and emphasizing a "complete the streets" philosophy.

MDOT changed legislation to enable creative funding and implementation of TOD. The goal of MDOT's TOD program is to "surround stations with vibrant neighborhoods where people can live, work, shop, or eat out, all within a safe and pleasant walk to trains, subways, and buses." The program is ensuring that station areas are market-ready for development, educating Maryland State agencies and localities to understand TOD and their roles, promoting TOD as a concept statewide, and enhancing the potential for Federal funding to expand transit by showing that development patterns can support transit. This programmatic goal has been successful in the West Hyattsville and State Center projects.

CDTC's New Visions plan also aligns regional-level transportation plans and programming with local planning and projects. The community and MPO have chosen to support more compact and connected development patterns. The New Visions program shows how the vision can continue to be implemented through subsequent updates, and at the same time reinforce and reassess community goals, such as updated new environmental goals.

By recalibrating the conventional housing affordability index to take into account the importance of place and its impact on household transportation costs, the Housing + Transportation Affordability Index is a practical tool to help agencies define relevant transportation and livability performance goals specific to their regions. Utilizing neighborhood-level housing and transportation cost data for 337 metropolitan areas, model results allow State and regional agencies to measure policy outcomes, and to coordinate regional transportation and housing investments more cost-effectively. For example, the San Francisco Bay Area's MTC is using the tool to determine variations in housing and transportation affordability based on location at the neighborhood scale, while understanding more fully the impacts of projected housing and transportation costs on the region. The detailed analysis generated from this tool can help inform policy dialogue about how to best identify affordable mobility options while preserving and building economic prosperity in communities, including rural areas, across the country.

7.3. Corridor and Area-Level Strategies

Several strategies support livability goals by implementing regional and State policies at the corridor and area level. Examples include:

Completing the networks and building transit-oriented and transit-ready corridors. Because many urban and suburban commercial corridors developed over time without strong connections or access to surrounding neighborhoods, many of the roadways are over capacity and clogged with local travel. A better connected network of neighborhood streets parallel to major highways can help relieve traffic growth along heavily used corridors, reduce congestion at major choke points and intersections, and improve multimodal choice within and between neighborhoods.

Effective corridor-level planning usually incorporates local land use and development decisions that offer fast, frequent, and dependable transit service and support seamless connections throughout the region, either through TOD or transit-ready development. TODs are either 1) currently served by transit or 2) planned in conjunction with transit route expansion. Transit-ready development principles are applied to redevelopment and greenfield sites on corridors where priority transit service is desired but not yet established. Planning and developing compact, mixed-use, and walkable neighborhoods at key intersections helps create transit targets for future enhanced and expanded service.

Align major facility design with the surrounding network and community context. As part of the Northeast Corridor Station Area Planning effort, the City of Charlotte's station area planning team helped change the design direction of a planned $50

million highway interchange near the proposed City Boulevard and Rocky River transit stations. Because of its scale and access limitations, the interchange as designed posed a challenge to achieving the station area's development potential. At the same time, construction was not being advanced due to funding shortfalls. City departments worked with stakeholders to develop an alternative interchange, with an expanded street network providing access to large underutilized properties adjacent to the proposed stations and the interstate. This effort saved the city and State $25 million and enhanced the future potential for TOD. Final design is complete and scheduled to be bid out in spring 2010.

Although primarily a major highway capacity project, the Woodrow Wilson Bridge was also designed and constructed to support Metro line expansion, if the transit agency wished to add a rail line across the bridge in the future. It also includes a multiuse path for bicycles and pedestrians. The bridge is a good example of proactive decisionmaking to incorporate a mode-balanced "complete facilities" approach in major highway projects, even if the surrounding pedestrian/bicycle network is not yet complete.

Linking land use and redevelopment decisions with transportation investments. Where land use and transportation practitioners have collaborated on an integrated vision to meet community goals, implementation still requires ongoing coordination and follow-through by all partners. While State and regional agencies are usually responsible for funding corridor-level and network improvements, many have also found it worthwhile to help localities update plans, codes, and ordinances to better align development with an integrated transportation system. Local government codes and ordinances—coupled with their own investment policies—can play a strong role in implementing an integrated regional and corridor framework. This can include updating zoning to be consistent with plans, revising development regulations to require building form and placement supporting walkability, complete streets standards, and a range of other policies, such as requiring less parking adjacent to transit.

CASE STUDY HIGHLIGHT

Hudson Bergen Line—Catalyzing Development

A hallmark of the Hudson-Bergen Light Rail Line expansion is that it has acted as a catalyst for both residential and commercial development. Throughout the project, the light rail line has encouraged compact growth and high-density housing along its entire route. In Jersey City alone, 8,000 housing units were constructed by 2007 and 10,000 more have been approved for construction. Along the line, the total number of new housing units is expected to reach 36,000, all with pedestrian access to light rail stations. In addition, the line facilitated construction of 18 million square feet of prime office space, enough to accommodate 60,000 jobs, all within walking distance of transit. The line also serves a station connected to Jersey City's 1-million-square-foot Newport Centre Mall, which was planned concurrently with the light rail line.

While the line has spurred new development, it has also supported existing communities by allowing reclamation of hundreds of acres of abandoned and often contaminated rail yards and industrial facilities along the Hudson River waterfront. The product is a corridor of high-value, mixed-use redevelopment enabling a renaissance for an older industrial city that had lost thousands of jobs and residents in the three decades prior to initiation of the light rail project. The light rail line serves the existing urban fabric of Jersey City, Bayonne, Hoboken, Weehawken, and West New York using former rail ROW. This ensures a link to existing low- and moderate-income neighborhoods with new employment locations along the waterfront.

LCI Funding

Project Type	Funding Amount	Percent
Pedestrian	$68,396,056	53%
Bike/Ped	$24,470,991	19%
Multi-Use Facility	$7,097,602	5%
Transit	$20,192,900	16%
Roadway Operations	$6,165,241	5%
Roadway Capacity	$3,181,618	2%

Source: Atlanta Regional Commission.[67]

At its inception in 1999, ARC's LCI committed $1 million of Federal transportation funds have been given annually to complete land use and transportation studies. The program also dedicates $500 million to fund transportation projects identified by the planning studies. The planning grants have been given annually to local governments and nonprofits to prepare plans for livability-focused enhancements of towns and activity centers and corridors. The grants are designed to encourage jurisdictions to more closely link transportation and land use decisions when determining development strategies. Funds are also geared toward expanding housing and transportation options to connect people to home, work, and recreation. "LCI plans generally attempt to take advantage of the infrastructure and private investments committed in the local community to achieve more balanced development and reduce vehicle miles traveled," according to ARC.

Transportation elements in downtown Fargo's Broadway Streetscape project were linked to a larger redevelopment initiative. Started in 1999, the 39-block Renaissance Zone exempts new development from local and State property and income taxes for 5 years, and exempts commercial tenants from State income taxes for 5 years. The program is the foundation for the Downtown Fargo Redevelopment Framework Plan and has spurred more than 180 projects, including several mixed-use developments. Building values in the Renaissance Zone have risen 110 percent—from $103 million in 2000 to more than $218 million in 2009. Among the $93 million in the 180 projects is the $18 million Cityscapes Plaza, a newly opened retail and student housing project. More than 60 infill and adaptive reuse condominium and apartment projects have been completed. The local housing authority is also leveraging affordable housing programs, such as HUD's Community Development Block Grants (CDBG), and has built 559 units of affordable housing. A smaller historic preservation zone within the Renaissance Zone leverages State and Federal income tax credits for restoration. The city's storefront and downtown rehabilitation program uses CDBG funds to provide a 50 percent matching grant.

Similarly, Chattanooga's Riverfront Parkway was central to the downtown's waterfront redevelopment and revitalization. The carefully redesigned parkway helps reconnect downtown to the river, while maintaining multimodal capacity.

Chattanooga's Redesigned Waterfront Under Construction

Chattanooga's riverfront underwent significant changes to help maintain the downtown's connection to the river.

Source: City of Chattanooga.[68]

7.4. Project-Level and Operational Strategies

Many transportation agencies have incorporated a livability-oriented program in planning, but have trouble following through during project programming, design, and delivery. Transportation agencies and local governments that have developed a sophisticated understanding of livability look beyond the project's transportation purpose, treating it as an investment that must be carefully designed and managed. Project-level implementation can reinforce livability goals by ensuring that there are appropriate design guidelines and standards, effective monitoring strategies, and performance measures. Linking transportation system design and operations with surrounding buildings, development, and open space can help create places that people value. Integrated design principles can be applied to downtown neighborhoods, growing suburbs, or rural small towns:

- Create focal points and gathering places that reinforce community identity
- Provide a variety of activities to encourage interactions and improve convenience
- Design buildings and infrastructure at a pedestrian scale
- Provide options to walk, bike, drive, and use transit

- Make open spaces accessible and available
- Reinforcing livability goals at project-level implementation can be supported through both design and operations.

Completing the street at the project level. Completing the street focuses on enhancing transportation user choice and experience in any mode. Depending on the context, this means defining users to include pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. A complete street can include sidewalks; bike lanes, or multiuse trails; special transit lanes; comfortable and accessible transit stops; protected crossing opportunities; median islands; accessible pedestrian signals; curb extensions; and more. Urban and rural streets may look different but still aim to balance the needs of different users. More complete streets can also improve safety, allowing people to access nearby destinations on smaller scaled, walkable, bikeable, and transit-friendly roadways.

- *Cathedral City, CA* improved capacity for Palm Canyon Drive, its main corridor leading through downtown, with a partial multiway boulevard, which also improved the image of the area. The boulevard slowed down through traffic and incorporated angled parking and pedestrian buffers. The design reorganized lane and intersection configurations to relieve bottlenecks and improve operations. It incorporated current bus operations, with potential for future light rail. Similarly, with Loudoun County, VA's Route 50, the design incorporated traffic calming, especially roundabouts, an improved capacity and safety while improving alternative transportation options.
- *The Broadway Streetscape enhancement* is a $10 million facelift of the main commercial and retail corridor of downtown Fargo. It included more pedestrian-friendly street design, decorative pavers, ornate light poles, iron street furniture, bicycle racks, trees, planting beds, and a road diet. Street designs were implemented to slow down traffic and promote walkability, and the area is now an official bicycle/pedestrian safety zone. It features a multiuse path, on-street bike racks, and bike lockers. Transit is conveniently available from downtown to other points in the area, and has increased in part due to transit programs implemented by NDSU.

Broadway Streetscape Enhancement

Source: Short Elliott Hendrickson, Inc., 2007.[69]

Operational strategies can increase choice and maximize existing investments. Operational strategies can help support overall livability by maximizing the performance of existing transportation system investments, often at less cost than building new capacity. They can also provide more transportation choice and access. While operational improvements have focused largely on vehicle throughput, balanced multimodal design can improve performance for all system users. Operational strategies can include improving system efficiency through transportation system management (TSM), travel demand management (TDM), improved transit service, and access management. Operational solutions can provide immediate benefits, get more results for the dollar, and offer flexibility for future system changes.

- *TSM* uses lower cost improvements, such as turn lanes, improving intersections, repairing bridges, improving technology, and traffic calming, and can deliver immediate improvements without major changes in roadway function or character. TSM is used more often in urban and developing areas facing congestion and user conflicts, but can also be applied to rural roadways. Raleigh's busy urban Hillsborough Street includes improved pedestrian crossings and signal timing changes, along with roundabouts at key intersections, to improve capacity and safety for all users. Route 50 demonstrated that roundabouts, median crossings, and other elements could deliver similar results on a rural roadway.

Hillsborough Street Improvements

Source: City of Raleigh, 2007.[70]

- *TDM* strategies support livability by providing more choice in travel through carpooling, vanpooling, carsharing, transit use, biking, walking, telework, designated park-and-ride lots, and parking management strategies.

Eugene BRT Visualization—After Photograph

Source: Federal Transit Administration, 2009.[71]

- *Transit Improvements.* The EmX Green Line BRT improved transit service between Eugene and Springfield, OR. The Green Line reduced average travel time and increased ridership by almost 50 percent, while providing neighborhood connections, more reliable service, and greater person-carrying capacity. The project integrated increased transit capacity with improved connectivity to major regional transportation hubs, offering more options to support travel demand.
- *Intelligent Transportation Systems* use computer technology to manage vehicles and routes, control signals and signs, and provide traveler information. ITS can enhance safety, reduce travel time, help drivers find the quickest route, and greatly improve transit service. Integrated ITS can allow a transit vehicle to hold a traffic signal longer to get through, or get a head start when it turns green, while displays at each transit stop let customers know exactly when the next bus will arrive.
- *Access Management* promotes safe and efficient use of the transportation network by coordinating access to major corridors, driveways, safe turning lanes, and median treatments, While often used along suburban corridors to limit access, many new corridor planning initiatives have shown that careful roadway design and addition of parallel local road networks can improve overall corridor performance. Gateway Route 1 includes agreed-upon standards at both the local and State levels. Palm Canyon Drive's partial multiway boulevard design includes faster through lanes and a local lane for business access.

7.5. Funding Strategies

Transportation funding for major projects has long been primarily a Federal and State obligation, financed largely through fuel taxes, sales tax revenues, fees, and bonds. Although statewide funding is essential, regions and localities do have the power to multiply its effectiveness (where allowed by State law). The private sector (for-profit and not-for-profit developers) is also instrumental in advancing livability at the local level. For example, building walkable, transit-oriented neighborhoods and connected street networks are effective ways to stretch limited public dollars.

In almost every case study, multiple funding sources were used toward common goals. For Gateway Route 1, MaineDOT used Federal Surface Transportation Program funds and a local match. Other projects were more complicated, such as FasTracks, which used a combination of Federal, State, and local funds; a local sales tax; TIFIA loans; and private funds. Charlotte coordinated multiple funding sources across different programs and departments. The Route 50 Corridor Coalition was initiated with local funding and contributions, followed by Federal and State funds as practical strategies were identified.

Livability also involves thinking ahead about long-term maintenance responsibilities. Roundabouts have been shown to reduce long-term operating costs when compared to signals. On Hillsborough Street, planners considered the maintenance of landscaping in relation to public utilities, especially overhead power lines. This requires coordination in the design phase and maintenance commitments after the project is finished. For example, utility agencies should not cut down trees added to a street to improve pedestrian conditions or place utility poles in the middle of sidewalks.

Guiding and leveraging private investment for public livability goals. Public investment in transportation can be maximized by creating an integrated framework to guide private investment. By including the development community in early planning and exploring realistic development potential at key sites during corridor or transit system planning, individual buildings or developments can add to the larger multimodal transportation network. Much of the network can be built by developers as new growth occurs, either in new greenfield development or as part of redeveloping existing "greyfield" shopping centers. Limited available public funding can be targeted toward connecting the dots of private investment with key segments, bridges, transit enhancements, or intersection improvements. An adopted transportation master plan and complete streets standards can help provide certainty and a level playing field for developers.

In Chattanooga, much of the redevelopment money from the city was coupled with private donations and maximized through the River City Corporation's involvement. In Fargo, the main funding source for redevelopment was private funds invested in the Renaissance Zone. Public-Private Partnerships are an advanced form of this. The private partner can expand its business opportunities in return for assuming the new or expanded responsibilities and risks of public projects. FasTracks has been successful in using broad-based funding mechanisms. FasTracks is funded through a combination of sources, including the voter-approved sales tax increase of 0.4 percent passed in 2004. RTD has leveraged public funds and used partnerships to start building much of the system through design, build, operate, and finance agreements.

Using regional and local money to align goals with implementation. MPOs are typically decisionmaking bodies for federally funded projects of regional significance. Working with government agencies at each level, as well as with communities, these organizations are responsible for completing the MTPs and TIPs, which identify funded projects. Projects included in a TIP are forwarded to the State for inclusion in the State Transportation Improvement Program (STIP). Regional, State, and local partners can effectively coordinate funding and award implementation money based on regional visions, supporting projects with feasible multimodal plans, adopted local land use plans and design guidelines, additional committed private investment and ROW donated, and public/private consensus on priorities.

Several of the case studies exemplify successful application of this strategy. CDTC has funded more than

65 planning studies through the Linkage program and has fast-tracked related projects. ARC approves approximately $1 million in study funds annually and allocated $350 million for priority funding of transportation projects resulting from LCI studies. Another $150 million was approved in the 2030 Regional Transportation Plan for transportation projects resulting from LCI studies. The projects derived from the Gateway Route 1 initiative are well positioned to receive better project scores in funding decisions under the State's Sensible Transportation and Land Use Policy Act. The PennDOT Smart Transportation initiative tries to ensure that fiscal realities affect project selection and development.

At the local level, governments are usually able to create and administer their own funding mechanisms (where allowed by State statute). Although specific conditions vary by State, local governments typically oversee the responsible administrating agencies for TIF districts, created to generate additional funding for public infrastructure improvement in the name of economic development and increased property values. In many cases, these financing instruments are critical to deliver the livability components of a transportation project. RTD instituted a regional sales tax for FasTracks, as did Charlotte to fund the Lynx Blue Line.

Possible Federal Funding Sources

There are many Federal funding sources available to promote livability through transportation projects. Some of these funding programs are administered by USDOT, while others are run by EPA and HUD. The following select examples are meant to illustrate the range of available funding types, not to represent comprehensive options.

Brownfields Grants (EPA). Grants are available to help pay for area-wide brownfields planning, assessment, and cleanup. EPA encourages applicants to show how their projects will fit into their communities' master plans or development plans.

Community Development Block Grant (HUD). Provides communities with resources to address a wide range of unique community development needs. The CDBG program provides annual grants on a formula basis to general units of local government and States.

Congestion Mitigation and Air Quality Program (USDOT). Funds are awarded through States or MPOs in air quality nonattainment areas for projects that reduce transportation-related emissions, including transit, bicycle, and pedestrian facilities.

Federal New Starts (FTA). Discretionary New Starts program is the Federal Government's primary financial resource for supporting locally planned, implemented, and operated transit "guideway" capital investments. From heavy to light rail, from commuter rail to BRT systems, the FTA's New Starts program has helped to make possible hundreds of new or extended transit fixed guideway systems across the country.

FTA Livable Communities Initiative (USDOT). Uses sustainable design concepts such as TOD to strengthen linkages between transportation services and communities. Eligible recipients are transit operators, MPOs, city and county governments, States, planning agencies, and other public bodies with the authority to plan or construct transit projects. Nonprofit, community, and civic organizations are encouraged to participate in project planning and development as partners with eligible recipients.

Sustainable Communities Initiative (HUD). Competitive grants in partnership with USDOT and EPA to stimulate integrated regional planning that guides State, metropolitan, and local decisions to link land use, transportation, and housing policy.

Sustainable Communities Program (formerly Smart Growth Implementation Assistance) (EPA). Provides technical assistance to Tribal, State, regional, and local governments, in partnership with HUD and USDOT, for integrating smart growth.

Transportation Infrastructure Finance and Innovation Act (USDOT). Provides Federal credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to finance surface transportation projects of national and regional significance. TIFIA can help advance qualified, large-scale projects that otherwise might be delayed or deferred because of size, complexity, or uncertainty over the timing of revenues. TIFIA funding is available to State DOTs, transit operators, special transportation authorities, local governments, and private investors.

7.6. Conclusion

Because of their comprehensive nature, livability and transportation projects often need to leverage a variety of implementation strategies and funding sources. In many cases, funding programs may be siloed or difficult to apply to more integrated transportation projects. Each of the case studies illustrates one or more ways of successfully innovating projects that meet broad livability goals. These strategies can help practitioners at all phases of project development deliver balanced, multimodal transportation networks that support infill and compact growth around existing centers—at the regional level, corridor level, and project level. More compact, connected development can reduce transportation project capital and operating costs, while reducing costs for households and businesses. It can also improve regional connections and personal mobility, increase transportation choices, and help foster livable communities.

- *Use a regional or statewide planning process to integrate livability into transportation policies.* Working at a regional or project level in several localities can be an effective way to develop and test new policies, design standards, and programs. This is especially true when linking transportation projects with land use, development, and economic goals and performance measures.
- *Broaden the scope of an existing corridor planning project.* Most MPOs have projects in their work program or TIP to address capacity issues on commercial corridors. Updating the project scope to include planning for a complete street network approach, land use and development planning, transit system expansion, and housing can relieve traffic growth along heavily used corridors, reduce congestion at major choke points and intersections, and improve multimodal choice within and between neighborhoods.
- *Use operational strategies to support phased implementation of livability projects.* Since rebuilding corridors, completing street networks, and building TOD can take time, short-term operational strategies can help maximize the performance of existing transportation system investments. They can also provide more transportation choice and access, get more results for the dollar, and offer flexibility for future system changes.
- *Coordinate current funding and programs to implement livability initiatives.* To ensure transportation investments are more consistent with broader livability goals, agencies can incorporate housing and community development policies and environmental concerns into investment decisions. Ensuring greater alignment in funding allocation starts with sharing funding resources for both planning and implementation. At the Federal level, the Sustainable Communities Partnership is integrating the planning process by encouraging metropolitan areas to integrate housing and transportation planning, providing HUD grants to support that integration, and coordinating other HUD, DOT, and EPA grant programs. The same approach can be effective at the State, regional, and local level.

7. Implementation and Funding—Endnotes

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Conclusion

Getting Started

For a practitioner or policymaker wanting to take the next step and incorporate livability principles into transportation, the comprehensive examples in this Guidebook might seem overwhelming—if you try to move forward on similar efforts all at once. Fortunately, taking all the steps at once is not how most agency or department work plans are organized. If you lead or work in a Metropolitan Planning Organization (MPO), you may be getting ready to update a Metropolitan Transportation Plan (MTP) or congestion management plan, or you may have a corridor plan identified in your work program. If you work in a State DOT planning office, you may be preparing to develop a statewide plan, working on new policies, or initiating a small towns planning grant program. In a Federal Region or Division office, you may be planning training workshops or supporting activities related to the HUD-DOT-EPA Partnership. In a transit agency, you could be embarking on a system or route expansion, a new light rail line, or working with local partners on transit oriented development (TOD) strategies. In city or county government, you might be starting on a comprehensive or neighborhood plan, creating new street design guidelines, initiating a corridor plan, working on downtown revitalization, or reviewing development proposals.

Whatever agency you work in or lead, whatever role you play, whatever resources are available, getting started on incorporating livability in transportation planning and implementation does not have to be complicated or intimidating. It could begin with an in-house meeting to review upcoming projects, discuss some of the examples in this Guidebook, and brainstorm potential ways to incorporate livability principles into an upcoming initiative. You might reach out beyond your own agency and regular activities to explore a partnership with people involved in land use planning, housing and community development, resource preservation, or transportation operations. You could decide to modify an existing project or program, initiate a new venture, or join and support one that is being led by a partner agency. You can pool and use existing resources, or use a new funding opportunity such as American Recovery and Reinvestment Act (ARRA), TIGER II, or HUD Sustainable Communities Grants to gather and focus partner efforts. A few considerations for selecting a kick-off project might include:

- *Engage community residents and stakeholders.* Understanding what livability means to the community is critical to developing comprehensive solutions. Many agencies have successfully used extensive public involvement and outreach in transportation planning. When the issues and partners start to include land use, housing, community development, and resource preservation, the messaging and outreach need to have a broader focus, without requiring attendance at many more meetings. It is equally important to develop an efficient,

engaging interagency process for the multiple new public-sector partners that may be involved. This can be done efficiently by working around the schedules of existing interagency efforts, adding a project-related meeting onto a regular meeting on housing or land use, making sure agendas match partner interests, and by rotating meeting locations and host agencies.

- *Start with something that matters.* It will take time, effort, and patience to develop comprehensive solutions that fit with community visions, so look for recognized issues and needs that will spark a big idea or compelling vision that can continue to inspire and engage partners and the public. In some cases, there may already be an ongoing community effort with widespread support—perhaps on climate change, sustainability, affordable housing, downtown revitalization, or green jobs—that would benefit from stronger transportation agency participation.
- *Welcome partners.* Successfully incorporating livability in transportation requires more partners than a typical planning process, both in terms of the kinds of agencies and organizations, and the level at which they operate. Depending on project focus, you may want to enlist housing agencies and private developers, resource agencies and utilities, city and county planning and zoning staff, business leaders and landowners, and a broad range of other community groups. You may find it easier to strengthen existing partnerships and working groups, such as an MPO or regional planning agency, than to start from scratch.
- *Pool and leverage funding.* While many transportation funding programs allow more flexibility than is typically used, it may not be realistic to expect that limited transportation funding can cover all the costs of a fully integrated planning effort. When a regional or corridor plan includes non-transportation partners and effectively addresses their issues and program requirements, it is reasonable to expect some cost-sharing. A carefully developed scope, work plan, and public involvement process can usually address individual agency needs and funding program restrictions at the same time.
- *Select a place.* Many of the case studies presented in this Guidebook address statewide or regional policies, while also solving corridor-specific or local issues. Since applying livability principles requires transportation agencies to work with localities (who typically have land use authority), public- and private-sector developers (who build the housing), and a range of other partners interested in specific places, it can be helpful to use a "place-based" approach even when working on broad policy and program development. This could mean focusing on a few demonstration sites along a multimodal corridor, such as potential transit development opportunities, selecting a few key communities or neighborhoods—urban, suburban, and rural—when working on a regional plan, or partnering with a few representative regions or MPOs when working at a statewide scale.

One Example: A Multimodal Corridor Investment Strategy

Gasoline Alley before-and-after simulation at Rio Road, Albemarle County, VA

Source: Urban Advantage, Albemarle County, Virginia DOT, and Thomas Jefferson Planning District Commission.[72]

Given the current economic uncertainty, a changing housing market, growing climate change and energy concerns, and reduced agency resources, a more integrated, phased approach to planning and project development increasingly makes sense to the public and policymakers. With many big-ticket conventional highway projects delayed due to budget issues, building a partnership and process focused on livability can help identify affordable, short-term, multimodal capacity, safety, and operational improvements—while creating a long-term vision and phased implementation plan for a corridor, transportation system, or region. Although this is just an example of one project type, and should not be seen as more important than any other type because it is explored in depth here, multimodal corridor planning is something in which virtually any agency staff could have a role; from initiating the study to bringing technical expertise or other perspectives into the process.

Multimodal corridor strategies can work at all scales, identifying an interconnected system of projects that can be implemented incrementally, project by project, over time as funding is available. For example, it is typical that much of a newly defined parallel road network can be built by developers as development occurs, either in new greenfield development, or as part of redeveloping existing greyfield shopping centers. Limited public funding can be targeted toward connecting the dots of this private investment, with a transit-ready development approach to support improved transit service over time. By focusing available housing and community development funds on these transit opportunities, transportation practitioners and urban planners can more readily provide a range of accessible housing opportunities and build the transit customer base, meeting multiple mobility and access needs in the process.

Multimodal corridors, and adjacent (re)development areas, are just one example project that agency staff or policymakers could initiate at any level: local, regional, State, or Federal; transit, aging, environmental or housing agencies; or advocacy groups. It is also a process that works best if they are ***all*** involved.

Cross-cutting corridor planning can be used to target and prioritize other investments in housing, community development, brownfield revitalization, water and sewer extensions, parks, schools, healthcare, senior centers, or climate mitigation and adaptation strategies. An extensive public outreach and engagement process provides an ideal opportunity for public education about related livability issues, including affordable housing, green building, and energy conservation. Combining a variety of marketing activities, like rideshare, energy conservation efforts, utility bill mailings, and advocacy organization marketing, with a corridor planning process can leverage transportation agency budgets and increase support for livability initiatives. Even if the vision seems grand, relatively small, incremental actions do add up. Completing street, sidewalk and bicycle networks to connect apartments, schools, and shopping; making every street walkable and wheelable within a half-mile of every transit stop or activity center; and making the street safe to cross at each bus stop can maximize the value of existing investments.

A multimodal corridor strategy fits well with emerging Federal policies such as DOT's Livability Initiative, EPA's area-wide brownfields approach, and the HUD-DOT-EPA Sustainable Communities Partnership. Integrated, multimodal transportation and land use planning can be used to link cities and suburban corridors, growing rural counties, and nearby small towns. Re-engineering existing roadways can improve vehicle throughput; safety; and pedestrian, bicycle, and transit service. A multimodal network of parallel roads can be laid out through existing underused shopping centers and strip commercial development. This new network can be used for local driving, walking, and bicycle trips, and to connect surrounding neighborhoods to jobs, shopping, and activities. Much of this local transportation network can be built by the private sector as development or revitalization occurs. Operational and access management improvements can boost regional throughput and local travel, safety, business access, and transit operations.

An all-hands-on-deck public process should include neighborhoods and nonprofits, businesses and developers, supported by inter-agency collaboration and a hands-on technical team of agency staff. Using

a voluntary incentive scheme that includes funding, transit access, and expedited approvals to encourage developer and landowner participation may work better than mandates. The corridor plan should be tied to local comprehensive plans, MPO plans, and State DOT and transit agency project programming, with projects used to demonstrate state-of-the art practices and policy changes.

Getting It Done

Once a vision is established and priorities identified, partners can focus on implementing the vision piece-by-piece, project-by-project. This could begin with including a planning or feasibility study in the MPO's Unified Planning Work Program, or broadening the scope of an existing study to include non-transportation partners and issues. Each partner agency should review community visions and program needs, considering potential strategies, project options and possible funding resources. Framing mobility needs within the context of community livability, while engaging representatives of other program areas (e.g. HUD, EPA, and local partners), may help identify a suite of resource options far in excess of what the transportation program alone could support. In some cases, funding accruing for long-term major projects that may be on hold can be re-purposed into multimodal corridor target areas, providing more immediate results. Targeted short-term action could include travel demand management (TDM), operational and access improvements, transit service enhancements, walk-bike improvements, and key connect-the-dots roadway links to private investment. Corridor implementation funding can be allocated in TIPs and agency budgets based on feasible multimodal plans that meet performance standards; adopted local land use plans and design guidelines; private investment committed; ROW donated; and substantial public/private consensus on project priorities.

Moving Forward

Although the preceding example describes a multimodal corridor strategy, the planning principles, process, partnerships, and implementation strategies can be applied to a much broader range of projects—from transit systems to regional scenario planning, urban neighborhood revitalization to rural main streets, or from county comprehensive plans to statewide policy development. For instance, a few regions or corridors could be selected for initial planning funding, with an expanded program ultimately available to any region meeting threshold requirements. The pilot projects might lead to development of new roadway design standards, access management or connectivity requirements, or new processes for State agencies and MPOs. In transit-system planning, the approach described above might be helpful in coordinating route selection and station-area design with revitalization planning for surrounding neighborhoods, and a HUD Consolidated Plan or local affordable housing program. A local implementation effort might include completing every street near downtowns, activity centers, schools, parks, or transit stops; for example, providing usable sidewalks, bicycle lanes or trails, comfortable transit shelters, and excellent street crossing details, to improve neighborhood accessibility, support infill housing development, and improve the transit customer-delivery system.

At whatever scale you choose to start in the transportation process, whichever agency takes the lead, an integrated planning approach can help jump-start short-term implementation projects, support sustainable economic development, and serve as a longer-term model for revitalization of corridors, neighborhoods, cities, and towns throughout the region and State. Many of these first steps, including planning efforts, code revisions, and policy changes can be pursued at the same time as operational improvements, streetscape investments, and housing development, rather than implementing each as an independent or sequential strategy.

The practice of incorporating livability into transportation plans, programs, and projects will continue to evolve. Existing transportation metrics are not typically comprehensive enough to also evaluate community development, housing, and environmental goals. New performance measures will be needed to allow communities and agencies to monitor the effectiveness of their actions and investments in livability over time.

Conclusion—Endnotes

72. Urban Advantage, Albemarle County, Virginia DOT, and Thomas Jefferson Planning District Commission. *Albemarle County Places29 Master Plan*. 2007.

U.S. Department of Transportation
Federal Highway Administration
Federal Transit Administration