



# GOING THE DISTANCE TOGETHER

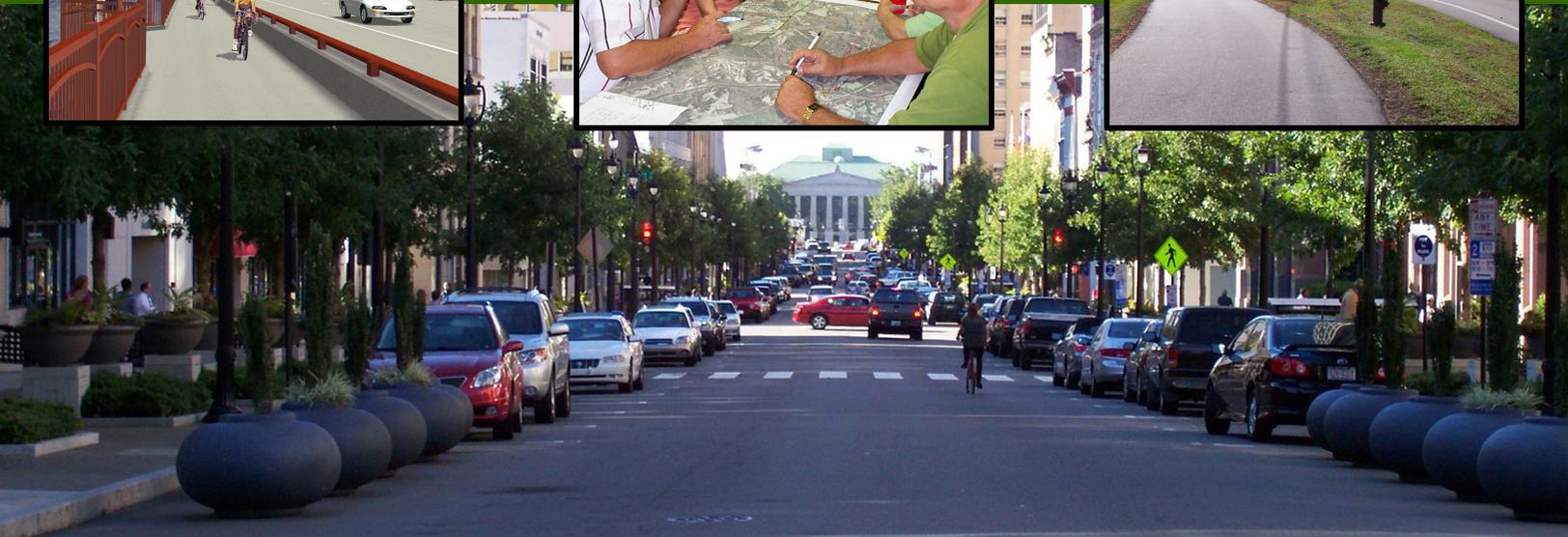


## *Context Sensitive Solutions for Better Transportation*



### A CITIZEN'S GUIDE

SEPTEMBER 2010





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# INTRODUCTION

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*The key is in not spending time,  
but in investing it.*

Stephen R. Covey

As you turn the first page of this book, you ask yourself, “What’s in it for me? Am I spending my time or investing my time?”

We live in an exciting time of great innovation and rapidly changing thinking about how to solve transportation problems. Since the early 1990s, hundreds of new organizations have formed to advocate for cyclists and pedestrians; curb sprawl and promote smarter solutions to growth; save scenic roads and promote heritage tourism; support local sustainable agriculture; bring back freight rail and promote light rail; and protect the environment by adopting new energy technologies and constructing resource efficient buildings. Curious people can tap into a vast universe of transportation information and technical assistance on the web, quickly educating themselves and their neighbors about new approaches in planning, design, construction and maintenance. The result has been an explosion of ideas and innovative transportation projects that has brought new life to urban neighborhoods, greater mobility to rural communities and provided solutions to many long-standing problems.

And yet ... too often citizens feel distant from transportation decision making and powerless to do anything about it. Isn’t there a better way to communicate with the “powers that be,” a better way to engage in transportation decisions that will profoundly affect our lives?

This guide can help you invest your civic energies wisely. Context-sensitive solutions (CSS), a consensus-building process, invites you to become a full collaborator in all aspects of transportation planning, from national, state and local policy to operations and maintenance; from broad community visioning to specific project construction.

We have tried not to “dumb down” the technical concepts and terms commonly used by professionals, but have organized the material to be accessible both on first read and as a future reference tool, with five chapters, illustrations, quotes and case studies to convey complex information at a glance. The chapters are organized as follows:

## **I. Transportation and the Quality of Life**

- Transportation is fundamental to achieving national goals, sustaining community values and promoting personal well-being.
- Asking the right questions can contribute to the right solutions.
- The relationship between transportation and quality of life requires an understanding of how, when and by whom transportation decisions are made as well as the community context in which they occur.
- Citizens must take the lead in scripting the transportation “play” by formulating and communicating the information that will feed into the *Community Context, Vision, Values and Plans*.
- The best process to foster collaboration and build consensus to make the transportation play a success is through *Context Sensitive Solutions (CSS)*.

## **II. Research on Community Context, Vision, Values and Plans: The Foundation of Context Sensitive Solutions (CSS)**

- Context questions can guide the *Community Context, Vision, Values and Plans* (abbreviated in this Guide to *Community Context*).
- Joint agreement between citizens and professionals on the definition, principles, qualities and outcomes of Context Sensitive Solutions (CSS) establishes the foundation of collaboration.
- Professionals from many disciplines can ensure that accurate information and best practices inform the definition of context, including the transportation context, and are included in the analysis of alternative solutions.
- Citizen stakeholders make an indispensable contribution to defining context.
- Asking the right context questions is the most important step in getting the right answers.
- Various tools and techniques can help to define context.

## **III. Shaping Transportation Decisions**

- It is important to be in the right place at the right time to influence transportation decisions.
- Important decisions are made at each stage in the *Life of a Transportation Project*.
- Citizens, practitioners and public officials all have a role in shaping decisions.
- Inter-disciplinary teams are essential in making good decisions.

## **IV. Understanding Professional Responsibility and Design Flexibility in Project Design**

- Learning about a transportation project in its earliest stages increases your chances of influencing its outcome.
- Projects should be linked to community vision, land use and the transportation context.
- Citizens should understand how practitioners view transportation context.
- Citizens should become familiar with both the analytical framework of engineers and the tools of the trade in transportation design.
- Citizens should understand how practitioners define their responsibilities.
- Citizens should adopt and adapt innovative tools of the trade.

## **V. Going the Distance Together: Partnership Through Collaboration**

- Collaboration and consensus have many benefits.
- Collaborative partnerships achieve better project results.
- Collaboration is challenging.
- Citizens, practitioners, and decision-makers should adopt a proven method for achieving collaboration that fits the community's needs and preferences.
- Citizens and practitioners should objectively measure project outcomes, including effectiveness of process and on-the-ground solutions.

As a concerned citizen, you are both a collaborator and a civic critic. You represent one of many perspectives, some of which may appear to be mutually exclusive. For example, community residents may focus only on how a particular transportation project works in their neighborhood whereas transportation engineers may be charged to ensure that the same project also moves people and goods throughout the region. At its finest, collaboration between citizens and transportation practitioners is a dynamic process that can address many needs and incorporate many perspectives, yielding results that are greater and better than the sum of their initial perspectives.

The purpose of this guide, and its companion guide for transportation practitioners, is to help you *ask the right questions at the right time* to ensure that transportation projects fit the context of your community. Context Sensitive Solutions (CSS) is based on the principle that if transportation professionals – policy-makers, planners, engineers, designers and operators – and citizen stakeholders collaborate, all parties will have less to criticize and more to applaud.

While the focus is on processes and decision stages common to all states and metropolitan areas, the principles, qualities, and multiple benefits of early and continuous CSS collaboration apply equally to the wide variety of transportation systems managed by city, county and regional agencies, from roads to rail. For example, when the text refers to the Statewide Transportation Improvement Plan (STIP), the local equivalent might be the Capital Improvement Program, though the form and timing of these two investment planning documents may be different. The point is that CSS is a commitment to a collaborative process to address all transportation needs, whether those are national, state, regional or local.

“Go the distance” to the end of *Going the Distance Together* and become a more powerful force for improving the quality of life in your community.

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# CHAPTER I.

## TRANSPORTATION AND THE QUALITY OF LIFE

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***“Whether it’s the best of times or the worst of times,  
it’s the only time we’ve got.”***

Art Buchwald, humorist

### Summary

- Transportation is fundamental to achieving national goals, sustaining community values and promoting personal well-being.
- Asking the right questions can contribute to the right solutions.
- The relationship between transportation and quality of life requires an understanding of how, when and by whom transportation decisions are made as well as the community context in which they occur.
- Citizens must take the lead in scripting the transportation “play” by formulating and communicating the information that will feed into the *Community Context, Vision, Values and Plans*.
- The best process to foster collaboration and build consensus to make the transportation play a success is through Context Sensitive Solutions (CSS).

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### WHY CARE ABOUT TRANSPORTATION?

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Transportation – our network of streets, roads, bridges, rail lines, waterways, sidewalks and bike paths – serves as the lifeblood of our communities. Perhaps this is why moderate and high-capacity roads are called “arterials,” fanning out into a series of smaller capillaries or “collectors” that feed the entire organ.

To be successful, a transportation system must provide both *mobility* – the potential for movement or the ability to get from one place to another -- and easy *accessibility* – the potential for access and interaction from place to place. In the United States, the term mobility has often meant movement by motorized vehicles, but increasingly communities are fostering mobility by non-motorized means such as biking and walking. Many communities today are fundamentally shifting their transportation paradigm from mobility – with its emphasis on driving speed and road capacity – to a new paradigm that balances accessibility with mobility through a variety of transportation modes.

Like the roots of a healthy tree that feeds community values, transportation mobility and accessibility affect every aspect of our quality of life: social and cultural factors; the economy; housing and education; the natural environment and resources; the built environment and mobility; public health and safety; and governance and public services.

# Quality of Life Common Community Values

Governance and  
Public Services

Economy

Built Environment  
and Mobility

Housing and  
Education

Natural  
Environment  
and Resources

Social and  
Cultural

Public Health  
and Safety

Transportation System  
supports all aspects of quality of life

Air Transportation

Railroads

Roadway  
Infrastructure

Public  
Transit

Water  
Transportation

Sidewalks, Bike Lanes  
and Greenways

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## ASKING THE RIGHT QUESTIONS IS KEY TO UNDERSTANDING CONTEXT AND EVALUATING PROCESS.

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***“If you ask the wrong question, of course, you get the wrong answer. We find in design it’s much more important and difficult to ask the right question. Once you do that, the right answer becomes obvious.”***

Amory Lovins, Chairman and Chief Scientist of the Rocky Mountain Institute

Asking the right questions is essential to achieving the right solutions. The place to begin is with your community’s **Quality of Life, Common Community Values**. As you describe your community to transportation practitioners, it is important to be clear about what matters most to you, what your problems are, and what you are trying to achieve.

In many communities, this is clearly stated in an updated comprehensive plan in which everyone has had a voice. The questions below can help you look at all aspects of the community to identify the issues that factor into good decision making.

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### **GENERAL**

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- What local/regional plans or policies best describe the community’s quality of life values to the transportation agency?
- What quality of life values are not currently documented in an adopted plan or policy?
- What can the community and/or citizen groups do to work with the transportation agency to address these gaps?

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### **BUILT ENVIRONMENT AND MOBILITY**

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- How would you characterize the general character of the community (urban, suburban, small town, rural)?
- What types of land uses are present (residential, commercial, industrial, institutional, agricultural) and where are they located? How is land use regulated?
- Is the public infrastructure capable of supporting the degree of development, both existing and planned?
- Is the community primarily auto-dependent or is it currently multi-modal?
  - Does the community provide infrastructure for non-auto modes (transit, sidewalks, bike paths)?
  - Do the majority of residents have non-auto alternatives to access employment, shopping and recreation opportunities?
  - Does the current development and infrastructure pattern accommodate or encourage walking/bicycling?
  - Does the current development and street pattern encourage and support transit use?
  - Does the community have a “Complete Streets” policy requiring streets to be designed and operated in a way that enables safe access for all users including pedestrians, bicyclists, motorists and transit riders?
- Is the area currently investing in operational improvements to address accessibility and mobility problems?
- Do any human-made physical features help to define the community's character or identity?
  - Is the scale of the transportation system in keeping with the character of the community/sub-communities?

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**NATURAL ENVIRONMENT AND RESOURCES**

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- Do natural features contribute to the character and aesthetics of the community?
- Is the scale of the transportation system in keeping with the surrounding natural features of the area?
- Are there significant protected natural resources within the planning area?
- Is there a protected or locally valued scenic vista or viewshed in the planning area?

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**ECONOMY**

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- Where are the primary employment centers?
  - Where do potential workers live in relationship to these employment centers?
  - What are the patterns of commuting in and out of the community?
  - Are there locations within the study area that are already targeted or are good candidates for redevelopment as employment centers?
  - How does the transportation system support or hinder job creation and retention for the area as a whole? For sub-areas?
- Where is commercial activity located and/or desired?
  - What is the character of primary commercial areas (for example, town center, neighborhood commercial, strip commercial, mall/shopping center)?
  - How does the transportation system support or hinder commercial activity for each primary commercial location?
- Is tourism a major factor in the area economy?
  - If yes, why are visitors attracted to the area? Does the transportation system recognize and support access to community assets?

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**HOUSING AND EDUCATION**

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- Where are the primary residential locations?
  - How close are these locations to daily commercial services? Can residents walk or bike to frequently needed commercial services?
  - Do residents have reasonable auto access to appropriate employment centers? Do they have public transit or other non-auto access?
- What sub-areas have been identified or targeted for new residential development?
  - Does the transportation system support or hinder provision of a broad range of transportation choices to new residential development?
  - Is the area actively seeking or implementing in-fill development? Are multi-modal options available or planned for these potential in-fill development sites?
- Are there sub-areas where housing prices and/or property tax values are impacted by the location, character or type of transportation infrastructure or services available?
- What percentage of children can walk or bike to school?
- Do transportation agencies have an on-going relationship with school boards or administration staff determining future school sites?
- Are roads and streets adjacent to schools safe for walking and biking?

- Do roads and streets adjacent to schools provide safe access for cars?
- If there are institutions of higher education – colleges/universities, training institutes, etc. – in the area, are there multi-modal travel options available?

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***SOCIAL AND CULTURAL***

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- How cohesive is the community? Do people have similar or varied values or lifestyles? Do they share the same history and culture? How do residents deal with their differences?
- Are there regional or community events, arts, music and/or other cultural opportunities that engage residents and attract visitors to the area?
  - Does the transportation system support or hinder access to these opportunities?
  - Are there multi-modal transportation options -- cars, buses, bikes, trains, etc. -- available to access these opportunities?
- Are there ethnic, cultural or religious groups with special needs that should be addressed during transportation planning?
- What cultural or historic resources have been identified or listed on local, state or national registers of historic places? Is the scale and type of adjacent transportation in keeping with the character of these resources?
- Does the area have formal or adopted aesthetic guidelines or regulations?

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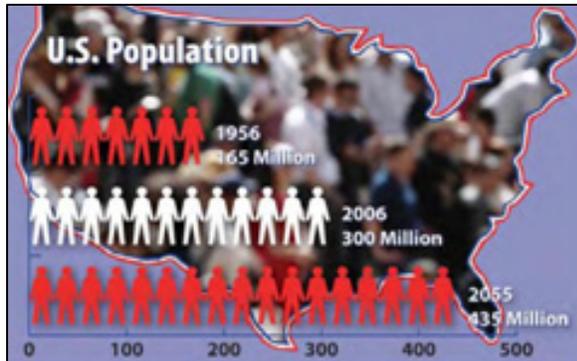
***PUBLIC HEALTH AND SAFETY***

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- Are transportation facilities safe and accessible to all residents, including people with disabilities?
- Are crimes associated with any transportation facility or service?
- Is the area designated as a non-attainment area that fails to meet air quality standards?
- What transportation strategies are in place or could be implemented to improve air quality?
- Is there transit service to hospitals and primary health care facilities?

The condition of our nation's transportation system determines our ability to reach national goals for economic prosperity and social justice; energy independence and reduction of carbon emissions; national security; and healthier, safer, better-planned communities. Transportation affects our personal goals every day because it is inextricably linked to land use; defines the relationship of the natural and built environments; and constrains our choices about where and how we live, work, shop and play.

Statistics show that we are facing significant challenges in balancing transportation with other quality of life values. Our transportation infrastructure is aging. In many parts of the country we do not have capacity to meet our needs.



Population growth and increasing vehicle and freight traffic have led to increased congestion, reduced air quality, and high transportation costs for families. As shown in the figure at left, the U.S. population grew by 135 million people in the fifty years between 1956 and 2006, and is expected to add an additional 135 million by 2055.

Texas Transportation Institute (TTI) congestion data for 2007 (*2009 Annual Urban Mobility Report*, [http://mobility.tamu.edu/ums/congestion\\_data/tables/national/table\\_2.pdf](http://mobility.tamu.edu/ums/congestion_data/tables/national/table_2.pdf)):

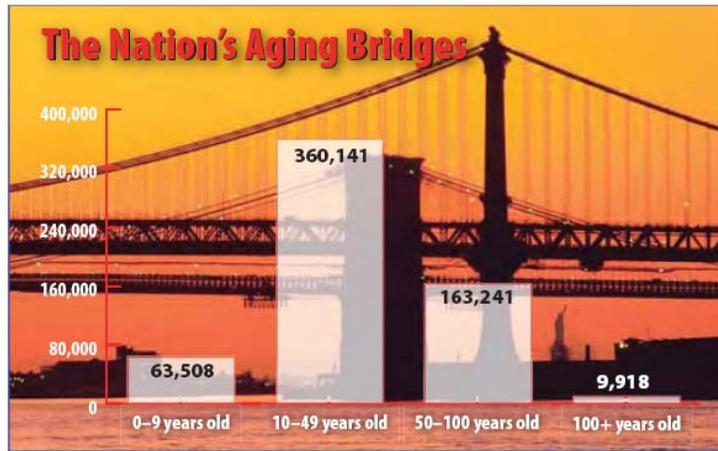
- 4.2 billion hours of delay caused by traffic in U.S. metropolitan areas in 2007;
- 2.8 billion gallons of wasted fuel consumption caused by traffic congestion in US metropolitan areas in 2007; and
- \$87.2 billion spent in lost time/productivity and wasted fuel due to congestion in the United States in 2007.



Maintaining and improving transportation safety through both infrastructure and driver behavior is a matter of critical importance to citizens and practitioners. The National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System web site presents some sobering statistics for the United States:

- 34,017 fatal vehicle crashes in 2008, with 37,261 people killed;
- 19,220 of those killed were the drivers of motor vehicles; 7,469 were passengers in vehicles; 5,290 were motorcyclists; and 5,282 were pedestrians, bicyclists, or other non-motorized users; and
- The number of fatal crashes decreased 8.3% between 1998 and 2008; the number of people killed (fatalities) decreased 10.2% over the same period.

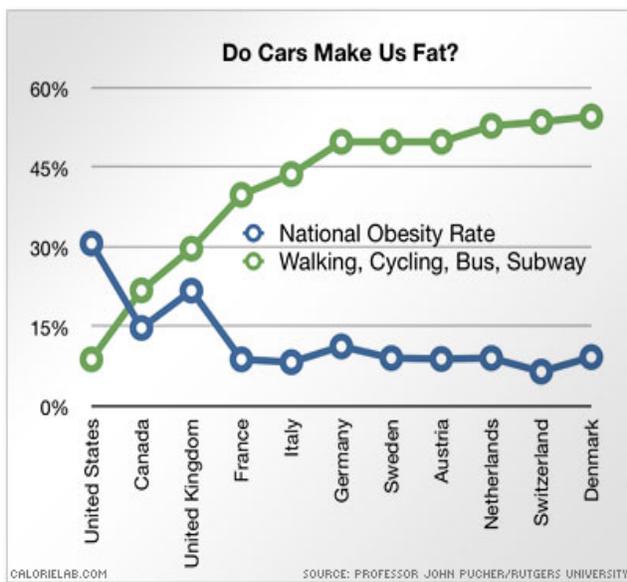
More than 30 years ago, in 1978, Congress determined that the number of bridges in need of significant repair or upgrading to maintain safety or improve capacity had reached dangerous levels. While we have made progress, statistics on the condition of our nation's bridges provide an alarming picture of the ongoing problems we face with aging infrastructure. A 2009 report from the American Association of State



Highway and Transportation Officials (AASHTO), America's Top Five Transportation Headaches – and Their Remedies, states “Approximately one in four of the nation's bridges are either in need of significant repair or are too narrow to handle today's traffic.”



For many, public transit is their only link to medical treatment, employment, personal business, or shopping. Research shows that investment in public transportation provides benefits in time savings, avoided job loss, avoided congestion and pollution, increased mobility for people without private vehicles, improved educational opportunities and increased access to jobs for urban residents.



A growing body of research points to the conclusion that our auto-oriented transportation system cannot be sustained into the future. Providing mobility options improves public health, and reduces transportation costs and the need for additional vehicle capacity.

The aging of the population is also a serious concern. Robert Darbelnet, President of the American Automobile Association, notes that “...the population is aging, and the future transportation system needs to be mindful of that change in demographics. By the year 2020 there will be 40 million people in this country over the age of 65 who will still have a license ... it’s not just a matter of allowing them to drive, it’s a matter of offering them alternative transportation solutions.”




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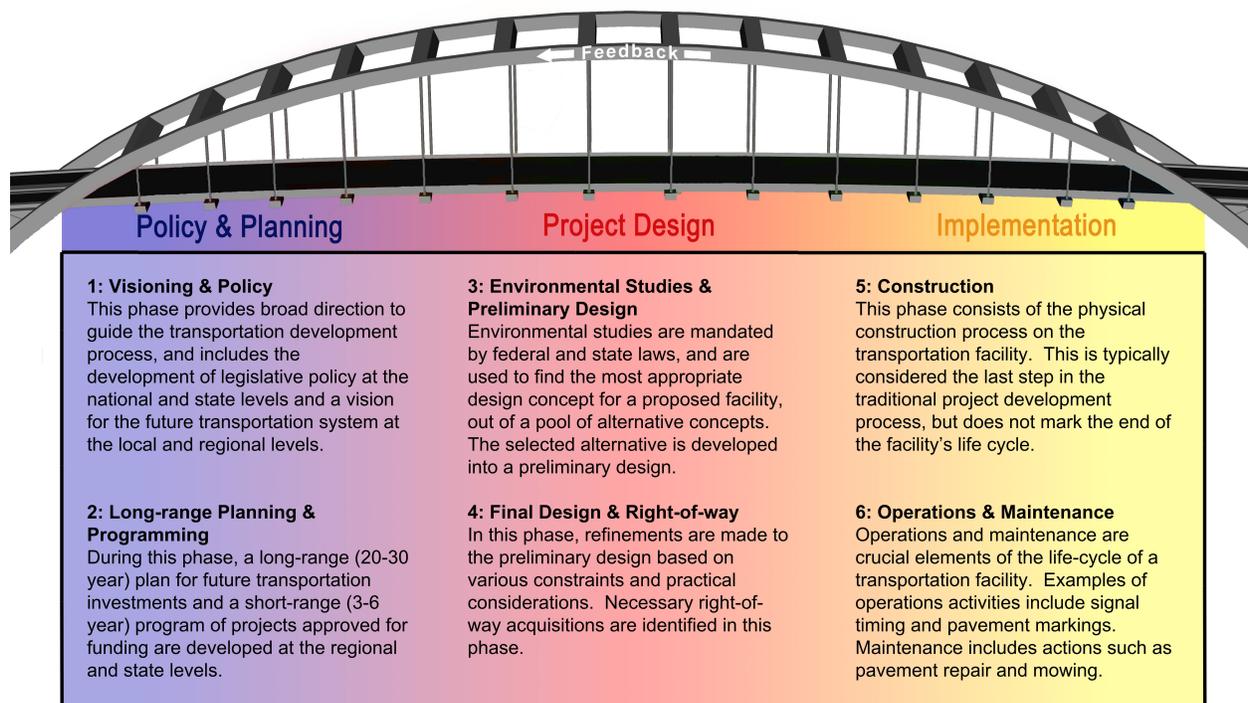
## THE LIFE OF A TRANSPORTATION PROJECT: A PLAY

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The transportation roots feeding the Quality of Life tree do not grow of their own accord. Many people are involved in producing, directing, designing, constructing, operating and maintaining the transportation system in an ongoing cycle of activities. The *community context* – the qualities and characteristics of the time and place in which people live – exerts a powerful effect on all of the actors and on the ultimate success of the project.

The life of a transportation project is somewhat analogous to a theatrical production. The play between quality of life and transportation unfolds in six stages that often overlap:

### Life of a Transportation Project A Play in Six Stages



To achieve authenticity in the theater, everyone – the producers, director, actors, set and costume designers – must understand the **context** of the dramatic composition and representation of the main elements of the drama. In transportation planning, the *Community Context* establishes the setting for the actors – citizens, transportation officials, financiers and others – who will determine the outcome of the play for the community's quality of life.

In the absence of a written planning framework, collaboration may become just a facile technique, with everyone struggling to establish the story line. The *Community Context* underlies all else, from beginning to end, and it provides the benchmark for evaluating success.

To successfully guide a transportation project, the *local community* is responsible for defining its own goals, unique qualities and characteristics, and projected needs to achieve a future vision for each quality of life element:

- Social and cultural life
- Economy
- Housing and education
- Natural environment and resources
- Built environment and mobility
- Public health and safety
- Governance and public services

The *Community Context* should be in place or well underway prior to undertaking a transportation project. Chapter II provides a guide to context questions your community needs to address as it crafts a vision, frames its values and translates them into plans that will inform every aspect of the transportation play.

**THE PRODUCTION TEAM:** Who is responsible for the production of good transportation? In our democracy, one can argue that every citizen is responsible for the future of his/her neighborhood, city/town, state and nation. But if we are responsible for everything, we may feel accountable for nothing. And so it is with the complex, tangled issues of transportation, where power seems to rest with government entities that own and control most roads and transit systems, set standards for safety and durability, and determine local land use. While citizens finance transportation with their tax dollars, they are often disengaged from what those tax dollars buy.

To answer the question of who is responsible for the production, it helps to untangle the players:

**THE PRODUCERS: ELECTED OFFICIALS** are at “the top of the heap,” chosen by the electorate to represent our interests and to make it possible for us reasonably to affect change:

- Senators and representatives in Congress establish transportation policy, set funding levels and decide who will control spending.
- Governors appoint agency heads for transportation, the environment, public health and safety, planning and much more; and they set the tone for state agency relationships with the public.

- State legislators decide how to spend your tax dollars on roads, mass transit, bike and pedestrian paths.
- Mayors appoint heads of local agencies whose plans and priorities will affect everyday community transportation choices.

Unless the producers are the very best, we cannot expect a long running, highly acclaimed play worthy of our financial backing. Therefore, candidates for elective office deserve serious scrutiny and tough questioning:

- How well do they understand transportation needs for the nation, state and local community?
- What is their vision for a future transportation network that addresses important national priorities?
- How well do they understand the critical link between land use and transportation?
- How well do they listen to the transportation concerns of their constituents? Have they demonstrated an ability to engage citizens in thoughtful planning and decision making?
- Do they have a good track record of surrounding themselves with people who are well qualified and who look to the future?
- What kind of working relationship do they have with the state DOT? Do they ask tough questions, demand good planning and require top transportation system performance?
- What is the evidence that they can make tough decisions on transportation or anything else?

***THE DIRECTORS: APPOINTED AGENCY OFFICIALS*** oversee the operations of government and carry out policies and funding decisions of elected officials who appoint them – at least in theory. The directors hire the crew, cast the actors and decide who will be in the play, when they will appear and what they will do. There are questions to consider here as well:

- Will the directors include only paid professionals or is there also a prominent role for citizens?
- Do citizens interact with the paid professionals throughout, or do they just pay the bills and make a guest appearance at the end?
- Does the director encourage collaboration or does he/she permit stage-hogs?

***SPONSORS AND FINANCIERS: TAXPAYERS, STATE LEGISLATURES, CITY COUNCILS, BONDING AUTHORITIES, PRIVATE EQUITY INVESTORS*** are essential to the production. Without funding, little can happen. Traditionally, a substantial percentage of transportation funding has come from federal and state gas taxes. Increasingly, however, state and local governments are looking to the private sector for partnerships in transportation funding. Sometimes this takes the form of a business tax on certain transit improvements. Ultimately, it is citizen taxpayers who fund the largest share of transportation infrastructure.

***PAID SCRIPT WRITERS, CREW AND ACTORS: TRANSPORTATION PRACTITIONERS*** are usually civil servants within government agencies or outside consultants. Here you will find a vast talent pool responsible for metropolitan planning and programming, environmental studies, project

design, acquisition of real estate, construction, and operations and maintenance for roads and transit systems. Depending on the nature of the project, experts from many fields may be involved: landscape architects, civil engineers, environmental scientists, transportation and land use planners, archaeologists, public health experts, architectural historians and many more. (See Appendix A and Chapter II for more on interdisciplinary teams.) These practitioners are usually licensed professionals trained to carry out many complex legal responsibilities for safety, environmental quality and durability, among others, all within strict financial constraints.

MAJOR TRANSPORTATION PLAYERS	
National	Congress
	Federal Highway Administration (FHWA) and Federal Transit Administration (FTA)
	Others including the U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, U.S. Department of the Interior, Federal land management agencies
State	Governor
	Legislature
	Department of Transportation (DOT) or State Board/Commission
	Air Quality Planning Agency (may be a regional agency in some metropolitan areas)
Regional	Metropolitan Planning Organization (MPO)
	Regional/Local Transit Agencies
	Rural Planning Organization (RPO)
Local	Elected Officials (Mayor, County Executive, City and County Council Members)
	Local Department of Transportation/Public Works
	Local Planning Department

Professionals in the trenches often understand the importance of citizen engagement, but they also take their cues from the top. If the boss stresses the importance of collaboration and consensus building with citizens, practitioners will follow. If they have attended training in context-sensitive solutions (CSS), they may have a better understanding of the value of early and continuous citizen involvement.

**UNPAID ACTORS: CITIZEN TAXPAYERS AND COMMUNITY ADVOCATES** are far more important than most directors acknowledge. Citizens can provide information about the

From STPP, Margins to the Mainstream, 2006.  
[www.transact.org/PDFs/margins2006/STPP\\_guidebook\\_margins.pdf](http://www.transact.org/PDFs/margins2006/STPP_guidebook_margins.pdf)

community context, vision and values that is essential to melding transportation with the community's desired quality of life. Unfortunately, rather than being collaborators in the production with elected officials, directors and paid professionals, citizen advocates are often relegated to a seat in the audience.

Federal transportation and environmental laws, from the National Environmental Policy Act (NEPA) in 1969 to the Safe Accessible Flexible Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU) in 2005, provide clear direction for public involvement in transportation. Too often, however, transportation agencies have followed the letter of the law but not the spirit of the law, and have viewed public involvement as just a legal requirement, often time-consuming and expensive, to be checked off the project development "to do" list.

Citizens should understand the role they can play in developing transportation plans and projects. How is public involvement in transportation carried out in your community? Is the public treated as a collaborator with decision-makers at all of the stages in the life of a transportation project, or as an outsider invited to the table only to fulfill a legal requirement?

To be an effective member of the transportation production:

1. **Do not wait for the DOT to define the community context and vision for the future; do it for them.** What is the vision for your community? How does it reflect the community values that characterize a high quality of life? Does the vision build on local assets and

tackle local liabilities? Does it exist in a few peoples' heads or have they written it down, held public discussions and made sure the vision appears in the adopted comprehensive plan? (See Chapter II.)

2. **Walk in the other person's shoes by accepting that everyone on both sides of the table has a job to do.**

Successful collaboration requires everyone to understand everyone else's job, their skills and training and the terms of their engagement in a project.

**Collaboration** - To cooperate with others in a joint endeavor or area of mutual interest in order to influence or effect the outcome.

<http://www.transportationforcommunities.com/>

- *Citizens* are responsible for making government work to reinforce community values and vision. Citizens should not expect state transportation planners to know their community values unless they express these values through a vision statement and comprehensive community plan. Citizen activists must also understand what is possible under current laws, regulations and professional practice. In turn, transportation professionals should not be surprised when citizens air their opinions to elected officials or in the press.
  - *Transportation practitioners* are responsible for many technical tasks to identify and solve transportation needs, fulfill laws, and find solutions that provide the best balance for transportation, the community and the environment. For example, *transportation planners* are responsible for accurately predicting needs far out into an ever-changing future; *transportation engineers* for carrying out many legal mandates, from easing congestion and operating under-funded transit systems to protecting the environment and improving communities; and *environmental and historic preservation agencies* for reviewing and making professional recommendations on difficult issues of planning and design.
3. **Educate yourself on the basics.** How are transportation decisions made? Who makes them? What are the key context questions at each stage in the life of a project? Understand why it is essential to *ask the right questions at the right time* to be effective in achieving your ends. (See Chapters III and IV).
4. **Don't go it alone.** Amplify your voice by aligning with like-minded local, state or national transportation advocacy organizations that have intimate knowledge of the issues. Where citizens organize, they often prevail.
5. **Gain a commitment from the DOT that there will be a meaningful public involvement process** and get specifics about how the agency will carry out that commitment in community meetings, the availability and transparency of documents, and the incorporation of citizen comments and concerns into final plans and project designs.
6. **Get your elected and appointed officials behind you.** Public agencies will pay more attention to a town's official representative than to a single individual.
7. **Adopt a proven method of collaboration: Context Sensitive Solutions.** The first task that citizens and practitioners can accomplish on a project is to establish a collaborative, interdisciplinary process that builds consensus. This process is known as *Context Sensitive Solutions (CSS)*. Chapter II defines CSS and its principles, qualities and outcomes, and shows how CSS can result in better projects. Chapter V focuses on how to establish a collaborative process and measure project success.

The Project for Public Spaces outlines the following four recommendations for designing quality places (from *A Citizen's Guide to Better Streets*. Project for Public Spaces, 2008, [http://www.pps.org/pdf/bookstore/How to Engage Your Transportation Agency AARP.pdf](http://www.pps.org/pdf/bookstore/How%20to%20Engage%20Your%20Transportation%20Agency%20AARP.pdf)):

1. Make “place-making” – i.e. the quality of a place – and far-sighted land-use planning central to all transportation decisions.
2. Re-envision zoning laws that typically separate rather than combine different land uses.
3. Get more mileage out of existing roads to maximize travel on local rather than state roads for local trips.
4. Rethink streets as public spaces.

Three projects from Colorado, Arizona and New Jersey illustrate the importance of translating community context, vision and values into carefully shaped transportation projects.

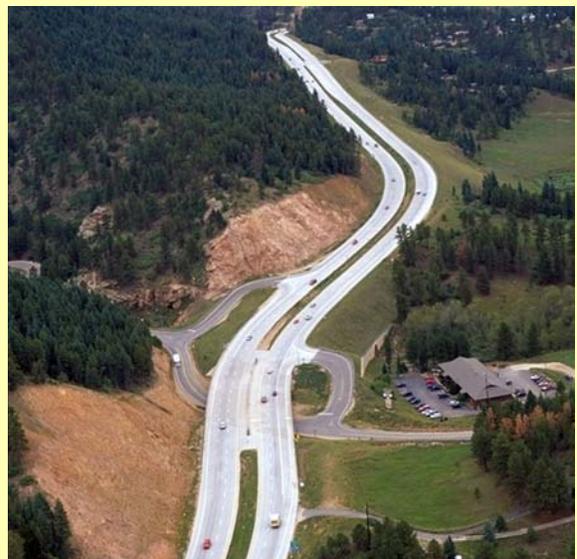
### US 285 Corridor in Colorado

The US 285 widening from Foxton Road to Bailey represents the convergence of a number of collaboration-based ideas in transportation planning, such as:

- Early commitment to environmental stewardship;
- Serious engagement of resource agencies and non-governmental agencies from the start;
- Small neighborhood and one-on-one meetings;
- Willingness to gather large scale environmental information (such as the aerial photography) to support early planning level consensus-building and decision making, and avoid revisiting decisions later;
- Flexible design;
- In-field multi-agency meetings, solution-seeking, and decision making;
- Context Sensitive Solutions- Integration of value engineering; and
- Continuity and minimization of time gaps in the planning and project development processes.

Most of these concepts are captured in the general theme of context sensitive solutions. In this case, context sensitivity is based largely on the development of informed alternatives resulting from resource knowledge and transparent decision making, with public comment and direction. Implementation of these organizational concepts by an experienced and professional team of planners created a successful process for US 285.

EPA Region 8 NEPA Programs specifically recognized the US 285 project for its use of CSS to avoid and reduce environmental impacts, noting “outstanding work was done by CDOT and its consultants. This is a great example of how impacts can be minimized.” Similarly, the ACOE noted the “excellent job the participants have done in avoiding and minimizing impact to the aquatic ecosystem.” (SHRP II C01: A Framework for Collaborative Decision Making on Additions to Highway Capacity; <http://www.trb.org/Publications/Blurbs/169691.aspx>)



## Sedona, AZ, Identifies Retention of Small Town Character in Community Vision

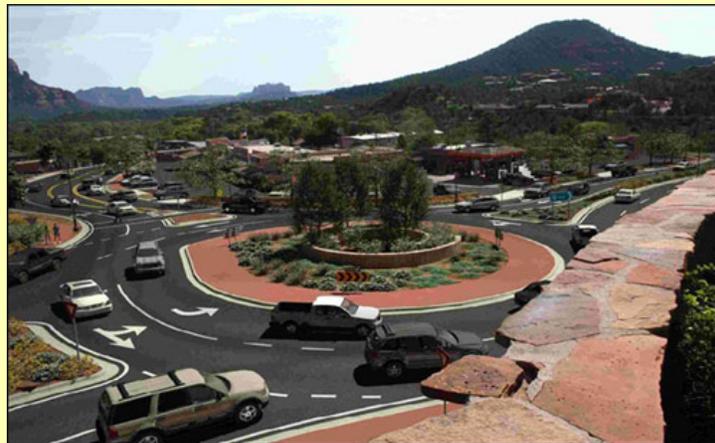
Sedona, AZ, identified its primary value as “*retaining small town character.*” The vision statement from the community plan is inspirational, stating Sedona’s aspirations to be:

- “...a city that is constantly vigilant over the preservation of its natural beauty, scenic vistas, pristine environment and cultural heritage;”
- “... a city that retains its small-town character and creates its manmade improvements in strict harmony with nature;”
- “... a city that lives up to the challenge of proper stewardship of one of the earth’s great treasures.”

The 2002 Sedona Community Plan shaped the vision for proposed improvements to State Road 179:

*“The design of the highway is also important relative to the small-town character of the community. Within the city, the highway should have the effect of a “context-sensitive” street rather than a high-speed thoroughfare. A 2-3 lane highway with the amenities and considerations mentioned above, provides the best opportunity to maintain a small-town character and be sensitive to the context in which it operates.”*

In 2009, construction was completed on Phase I of improvements to State Road 179. Based on an extensive stakeholder collaboration process, state and local officials, citizens, and other interested stakeholders were able to reach a compromise improvement plan that called for a divided two-lane facility with medians and roundabouts. The design allowed for improved mobility in the corridor, while limiting impacts on surrounding natural and community resources.



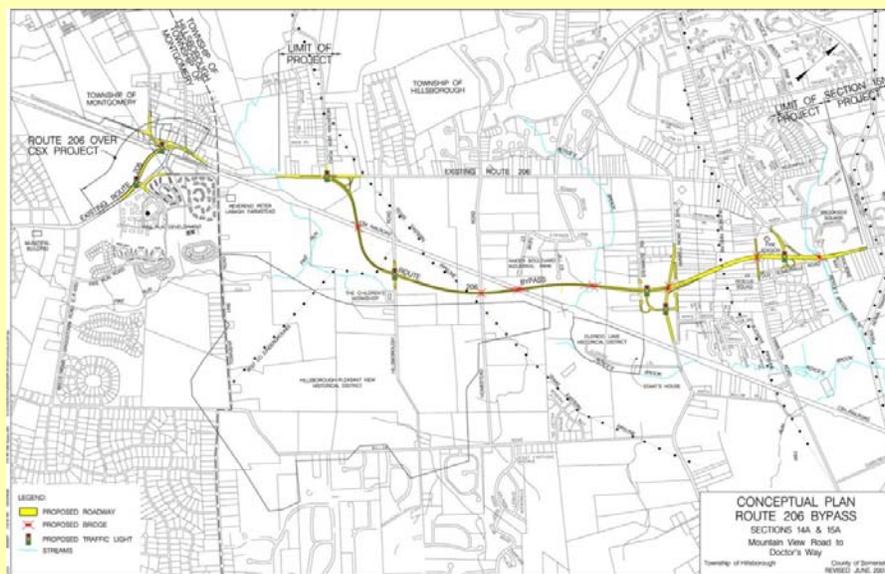
*(Sources: Arizona Route 179: Valuing a Unique “Sense of Place” by Ernie Strauch, Vice Mayor, City of Sedona; and SR 179 Reconstruction Case Study, NCHRP Report 642)*

## Mayor Leads NJDOT to Cost-Effective Innovative Design Solution Route 206 Bypass in Montgomery, NJ

The Route 206 Bypass is part of a state highway that runs north-south for the entire length of New Jersey. In Montgomery Township, Route 206 serves as a connection between I-287 and the New Jersey Turnpike in central New Jersey. The Mayor was very concerned about the potential impact of the alignment and design of a proposed Route 206 bypass through her township. She began to attend every meeting about the project, raising questions and voicing objections formally and informally, developing relationships with staff at NJDOT, and working with other stakeholders, particularly a citizens' transportation advisory committee and other residents whom the project would affect.

The Mayor also asked key NJDOT staff to work with Montgomery to revisit the project's alignment using the principles of CSS. Staff suggested some ways to reduce the impact of the project, dropping the design speed of the roadway and reducing the number of lanes from four to two. But it was the Mayor who proposed the most significant change: re-routing the southern terminus of the project to reduce traffic impacts on the town. The Mayor persisted in presenting this design alternative to DOT staff and leadership at every opportunity.

Recognizing the value of a design that could achieve a better and more cost effective project, NJDOT's Bureau of Value Engineering, in collaboration with the Division of Project Planning and Development, initiated a "Smart Solutions" process that culminated in an intensive workshop that drew elected officials, planning board leaders and engineers from Montgomery Township, Hillsborough Township, Somerset County, NJDOT and a key member of the New Jersey State Assembly. NJDOT staff presented the original and alternative designs and, with support from Somerset County planners, worked to forge a consensus around support for the new design.



As a result, the new alignment proposed by the Mayor eliminated two bridges and a cloverleaf interchange, avoided bisecting a neighborhood in a manner that isolated affordable housing, reduced the impact on the environment and local farmland, and prevented the need for NJDOT to purchase additional right-of-way. The result was a project that was less expensive and had less impact on local traffic, neighborhoods, habitat and farmland. The project is now moving forward with state funding, and construction is scheduled to commence in 2010.

***Money frees you from doing things you dislike. Since I dislike doing nearly everything, money is handy.***

Groucho Marx, Actor

One important context element to identify early on in project planning is the budget:

- How much is the project estimated to cost?
- What assumptions went into this estimate? How realistic are they? How do they constrain choices?
- Has agency staff established a budget for the project?
- Have elected officials and/or private investors approved the budget?
- Is the budget transparent -- that is, do all stakeholders understand the same set of budget numbers and facts?

No one likes to face financial constraints in implementing their community vision. Many would argue that if the vision is exciting enough the money will follow. There is much to commend this point of view. Yet, avoiding understanding budgets we dislike can lead only to untenable plans that may never see the light of day.

The key to implementing visionary plans and projects is to keep in mind that public and private funding are scarce, and that many people and projects are competing for the same funds. As Groucho Marx notes, "money is handy," but you are better off if you accept the challenge to do more with less.



***Without a vision,  
the people perish.  
Proverbs 29:18***

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## CHAPTER II.

# COMMUNITY CONTEXT, VISION, VALUES AND PLANS THE FOUNDATION OF CONTEXT SENSITIVE SOLUTIONS (CSS)

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*“For me context is the key – from that comes the understanding of everything.”*  
Kenneth Noland, American artist

### Summary

- Context questions can guide the *Community Context, Vision, Values and Plans* (abbreviated in this guide to *Community Context*).
- Joint agreement between citizens and professionals on the definition, principles, qualities and outcomes of Context Sensitive Solutions (CSS) establishes the foundation of collaboration.
- Professionals from many disciplines can ensure that accurate information and best practices inform the definition of context, including the transportation context, and are included in the analysis of alternative solutions.
- Citizen stakeholders make an indispensable contribution to defining context.
- Asking the right context questions is the most important step in getting the right answers.
- Various tools and techniques, including planning/design charrettes and visual simulation, can help to define context.

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### IT’S YOUR CALL: COMMUNITY CONTEXT

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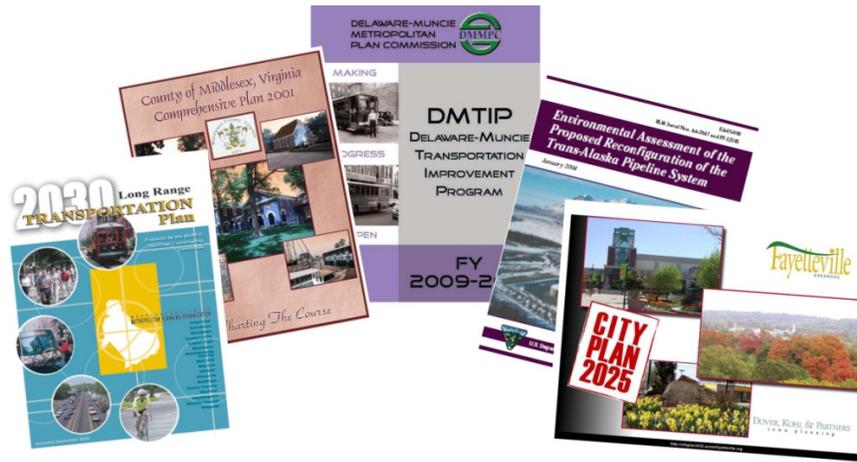
How does your community define its quality of life goals? Is the vision of the future set forth in a formal comprehensive plan in which the community and elected officials have participated? Does the plan speak to different values that may be held by different segments of the community? In other words, what is the generally agreed-upon context within which transportation projects will take place?

As noted in Chapter I, the *Community Context* underscores the importance of context, vision, values and plans in informing transportation planning at the state, regional and local levels. Many excellent written and professional resources can help communities undertake comprehensive planning (see <http://www.planning.org/education/citizen/index.htm>). Even in the best-planned communities, all transportation players must share some common understanding of context if they are to collaborate towards a common end.

*Community Context* helps your community more precisely define how transportation projects can help achieve your goals. In Chapter III, you will learn about the stages in transportation decision making where citizens can be the most effective collaborators and achieve the greatest impact on the outcome. But first, *Community Context* should set the stage and closely guide the script.

Developing *Community Context* is the responsibility of the community and its citizens. It requires substantive discussion of the future “look and feel” of the community, as well as a robust process to ensure that everyone hears and appreciates all ideas and perspectives.

Transportation practitioners should play a supporting role in developing a community vision. Further, they need to understand who participated – and more importantly who did not – and the level of consensus achieved in order to ensure that the public involvement processes for transportation plans and projects are designed to fill any gaps or rationalize any inconsistencies.



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## WHAT ARE CONTEXT SENSITIVE SOLUTIONS (CSS)?

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In the transportation world, the concept of Context Sensitive Solutions (CSS) evolved in response to frustrations shared by many citizens and transportation practitioners:

- Too often, communities failed to clearly define their community vision, values and plans, or to clarify their need for a specific transportation project prior to planning and design.
- Public participation was not working well to ensure that quality of life and community values guided all phases of a project.
- Failure to ask the right questions, define the right context and apply the right design guidelines had too often resulted in unnecessary damage to the natural and built environments without necessarily solving the transportation problem.
- Transportation practitioners too often worked in “silos,” failing to include interdisciplinary perspectives essential to creative problem solving.
- The failure to reach consensus led to persistent and mounting delays, escalating costs, and recycling of projects year after year.

In 1998, *Thinking Beyond the Pavement*, a conference of transportation professionals and citizens, addressed these issues. At the conclusion of the meeting, a working group proposed what has come to be known as “Context Sensitive Solutions.” Since that time, numerous conferences, working groups, and research projects have expanded the transportation community’s knowledge and understanding of CSS. The most recent definition, principles, outcomes, and qualities of CSS, published by the Federal Highway Administration (FHWA) and American Association of State Highway and Transportation Officials (AASHTO) in March 2008, are shown in the graphics on pages II-4 and II-5.

To foster good collaboration between communities and transportation planners, CSS requires that the community make available in writing the basic Quality of Life context, values, vision and plans outlined in local and regional documents.<sup>1</sup>

CSS also requires understanding the *transportation context* and planning documents may or may not adequately address important transportation questions. Transportation planners and engineers are trained to ask context questions such as: What role does a particular road segment or transit mode play in the larger system? What are the crash rates? What is the condition of the road? Are there issues in the right-of-way such as poor visibility, flooding or inadequate signage that contribute to hazards? **No discussion on CSS is complete without a full understanding of both the community context and the transportation context.**

“Of course,” you say. “CSS makes sense. Why would you do it any other way?” As noted in Chapter I, in the transportation play, public agencies can sometimes view their role as director, producer, scriptwriter, set designer, crew and cast. But to achieve the best outcome, they must engage citizens as essential actors and beneficiaries whose local knowledge and wisdom are indispensable and whose quality of life is at stake. After all, it is public tax dollars that make the production possible.

The implications of CSS for public agencies are substantial and go well beyond the usual scope of public involvement. CSS requires a sincere agency commitment to:

- Benefit from interdisciplinary perspectives by including a variety of disciplines;
- Develop a full understanding of community values and the physical setting;
- Engage in sustained, substantive collaboration with citizens to build consensus;
- Apply design flexibility;
- State a clear project purpose and examine various alternatives to meet that purpose;
- Track the project throughout its life cycle; and
- Monitor, evaluate and continuously improve the collaborative process.

At the time of the *Thinking Beyond the Pavement Conference* in 1998, few transportation agencies had adopted these requirements, yet most wanted the positive outcomes that CSS promised: safety, harmonious design and more satisfied stakeholders. Initially called CSD (context-sensitive design), this concept applied primarily the project design stage. Subsequently, as states and citizens saw the benefits of CSD, CSS (context-sensitive solutions) evolved to include public engagement and collaboration during all aspects of transportation and policy and planning, design and environmental review, construction, operations and maintenance. Since 1998, many states have implemented changes to their planning and project development processes that are consistent with the CSS definition, principles, qualities and outcomes. The most current list of these states can be found by clicking on State Profiles on the national website for CSS, <https://www.fhwa.dot.gov/planning/css/>.

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<sup>1</sup> This guide refers to the planning and visioning documents collectively as the ***Community Context, Vision, Values and Plans***.

## CSS DEFINITION

Context sensitive solutions (CSS) is a collaborative, interdisciplinary approach that involves all stakeholders in providing a transportation facility that fits its setting. It is an approach that leads to preserving and enhancing scenic, aesthetic, & historic, community and environmental resources, while improving or maintaining safety, mobility, and infrastructure conditions.



## CSS PRINCIPLES

These core CSS principles apply to transportation processes, outcomes and decision making.

- Foster continuing communication and collaboration to achieve consensus.
- Exercise flexibility and creativity to shape effective transportation solutions, while preserving and enhancing community and natural environments.
- Demonstrate a comprehensive understanding of contexts.
- Strive toward a shared stakeholder vision to provide a basis for decisions.



## CSS OUTCOMES

Context sensitive solutions lead to outcomes that:

- Demonstrate effective and efficient use of resources (people, time, budget) among all parties.
- Are in harmony with the community and preserve the environmental, scenic, aesthetic, historic and natural resource values of the area.
- Are safe for all users.
- Solve problems that are agreed upon by a full range of stakeholders.
- Meet or exceed the expectations of both designers and stakeholders, thereby adding lasting value to the community, the environment and the transportation system.



# CSS QUALITIES

Context sensitive solutions is guided by a process which:

- Involves a full range of stakeholders (including transportation officials) in all phases of a transportation program.
- Communicates early and continuously with all stakeholders in an open, honest, and respectful matter, and tailors public involvement to the context and phase.
- Clearly defines the purpose and seeks consensus on the shared stakeholder vision and scope of projects and activities, while incorporating transportation, community and environmental elements.
- Encourages agency and stakeholder participants to jointly monitor how well the agreed-upon process is working, to improve it as needed, and when completed, to identify any lessons learned.



- Seeks to understand the landscape, the community, valued resources, and the role of all appropriate modes of transportation in each unique context before developing engineering solutions.
- Encourages mutually supportive and coordinated multimodal transportation and land-use decisions.
- Tailors the transportation development process to the circumstances and uses a process that examines multiple alternatives, including all appropriate modes of transportation, and results in consensus.

- Establishes an interdisciplinary team early, including a full range of stakeholders, with skills based on the needs of the transportation activity.
- Draws upon a full range of communication and visualization tools to better inform stakeholders, encourage dialogue, and increase credibility of the process.
- Secures commitments to the process from local leaders.
- Uses a clearly defined decision-making process.
- Tracks and honors commitments through the life cycle of the project.



National transportation organizations have funded research to identify the benefits of CSS and provide guidance on implementation and measuring the results. While most states have implemented new policies, practices and/or procedures that are consistent with CSS, what they do is not always called CSS. This can definitely be confusing for citizens, but it is the philosophy of CSS that is important, not the name. The following table contains a partial list of program names that are sometimes linked with CSS, but are not entirely equivalent to CSS. When state and local transportation agencies use these terms, citizens should be aware of this potential connection, but should not take it for granted. Some of these policies may contain only certain elements that are related to CSS – for example, some may emphasize design flexibility but not necessarily reflect other key CSS principles such as collaboration among citizens, practitioners, and other stakeholders.

**Other Program Names Related to CSS**

***A rose by any other name would smell as sweet ... or would it??***

Context Sensitive Sustainable Solutions (Oregon)	Complete Streets Initiatives (ITE)
Transportation Design for Livable Communities (Florida)	Stewardship Initiatives (North Carolina)
Practical Design/Right Sizing (Kentucky and Missouri)	Integrated Design (AIA)
Sustainable Transportation Strategies (AASHTO)	Common Sense Solutions
Smart Transportation (New Jersey and Pennsylvania)	Streamlining Initiatives (FHWA)
Community Sensitive Design (Wisconsin)	Linking Planning and NEPA (Arkansas)
Urban Transportation Initiative (Texas)	

**Federal Highway Administration's Commitment to CSS**

The Federal Highway Administration is committed to improving the natural environment and community outcomes of transportation decision making. The Vital Few Environmental Streamlining and Stewardship goal (Environment VFG) sets expectations, measures, and methods for advancing an improved and efficient environmental review process and for demonstrating environmental stewardship. CSS is one of the specific supports of the Environmental Streamlining and Stewardship goal. Specifically:

*To improve the environmental quality of transportation decision making, all 50 States, the District of Columbia, Puerto Rico, and the Federal Lands Highway (FLH) Divisions will use, by September 30, 2007:*

- Integrated approaches to multimodal planning, the environmental process and project development at a systems level; and/or
- Context Sensitive Solutions (CSS) at a project level.

*From Federal Highway Administration's Vital Few Goals:*  
<https://www.environment.fhwa.dot.gov/strmlng/vfovervw.asp>

States with Formal CSS Policies/Programs			
Alaska	Idaho	Michigan	Pennsylvania
California	Illinois	Minnesota	Rhode Island
Connecticut	Indiana	North Carolina	Tennessee
Florida	Kentucky	New Jersey	Utah
Georgia	Massachusetts	New Mexico	Washington
Iowa	Maryland	New York	Wisconsin

Source: [www.fhwa.dot.gov/planning/css](http://www.fhwa.dot.gov/planning/css) – list is partial, and reflects information as reported by state DOTs.

By 2010, CSS had achieved official recognition:

- The Federal Highway Administration (FHWA) had designated CSS as one of its Vital Few Goals, provided funds for conferences and training, and set up a CSS website rich with information ([www.contextsensitivesolutions.org](http://www.contextsensitivesolutions.org)).
- The American Association of State Highway and Transportation Officials (AASHTO) had conferred awards on CSS projects through well-publicized competitions.
- The Transportation Research Board (TRB) had funded considerable research and guidance on CSS (including this Citizen’s Guide and the companion Practitioner’s Guide). See Appendix C for a listing of research projects.
- Many states had instituted CSS policies and training courses, and a few had adopted some form of CSS legislation.
- Projects produced through CSS had demonstrated new and exciting results and received high community praise.

**What is the Status of CSS in Your State or Locality?**

- Does your state or local transportation agency have an adopted policy on CSS?
- Does your state or local transportation agency include any information about CSS on its website?
- Have your state or local transportation agencies held formal training sessions related to CSS? When? Who was involved?
- Are there examples of projects where your state or local agencies have applied CSS?

However, CSS still has a long way to go to become standard operating procedure in most state and local transportation departments. Many discuss CSS but, in reality, few have integrated CSS into routine decision making and followed its principles comprehensively and consistently.

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**MANY DISCIPLINES CONTRIBUTE TO DEFINING THE CONTEXT**

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***“A problem well stated is a problem half solved.”*** –  
**John Dewey, Psychologist and Educational Reformer**

The mission of transportation agencies is to solve problems related to moving people and goods without creating new ones. How they define problems determines how they will solve them. To state a problem

well requires understanding the *context* of that problem. To define context, frame transportation problems, analyze alternatives and find solutions requires experts from many disciplines and citizens with many different perspectives.

Professionals in a variety of disciplines are indispensable in understanding context. The chart below shows the role each one plays in a project. **Appendix A: Transportation Disciplines** describes these roles in greater detail including professional training and certification, contributions to defining the context of a transportation project, roles at certain stages in the life of a transportation project, and work samples.

Professional Disciplines and Their Roles in Transportation Planning and Project Delivery	
Discipline	Role
Archaeologist	Assists engineers and planners by investigating the potential presence of, or overseeing handling of, known historic artifacts.
Budget/finance professional	Forecasts expected revenues to ensure that planned projects can realistically be funded.
Construction engineer	Oversees fieldwork, ensuring that the design engineers' plans are followed accurately, infrastructure meets safety standards and pavement conditions are adequate.
Economist	Provides understanding of the economic impacts of transportation projects on communities.
Environmental scientist	Assesses, documents, and mitigates the environmental impacts of transportation projects to comply with state and national environmental laws and regulations. Environmental scientists also participate in earlier stages of long-range planning and programming and offer insight on selecting and prioritizing potential transportation improvements to minimize potential environmental impacts.
Geographic Information Systems (GIS) specialist	Assists engineers and planners by mapping data and conducting analysis using geographic data.
Historian/architectural historian	Assists engineers and planners by providing information about buildings or lands of historical or cultural significance.
Land use planner	Works with transportation planners and engineers throughout the life of a project to integrate and coordinate land use and transportation plans, policies and implementation.
Landscape architect	Integrates a working knowledge of art, architecture, civil engineering, environmental science, social science and physical planning to preserve, design, and manage practical, safe, healthy, aesthetic and sustainable relationships between people, infrastructure and development on the land.
Maintenance engineer	Maintains the constructed transportation facility through activities such as pavement repair and vegetation management.
Marketing/communications professional	Designs user-friendly documents and websites to more effectively communicate information about transportation planning and projects with the public.
Project manager	Shepherds each specific project from beginning to end, with the ultimate goal of getting the project delivered on time and within budget.

Professional Disciplines and Their Roles in Transportation Planning and Project Delivery	
Public health professional	Assists engineers and planners in understanding the potential negative impacts of transportation projects, and analyzes how the design of a project could improve public health.
Public involvement specialist	Designs and conducts public engagement strategies for transportation policy, planning, programming, and preliminary design phases.
Real estate appraiser	Determines the value of properties and/or easements that must be acquired for transportation projects.
Social scientist	Evaluates the social context and/or impact of transportation plans and projects through methods such as estimating the social impacts of specific policies and projects or recommending in the preliminary design phase how best to fit a project within a specific community.
Traffic operations engineer	Focuses on how transportation facilities function, such as appropriate applications of traffic signals, stop signs, yield, and speed limits.
Transportation engineer (design engineer)	Combines information from many other professionals (such as planners, environmental scientists and others) and the community with established engineering principles to design a project that safely serves the intended purpose.
Transportation planner	Forecasts future transportation needs using current demographic and traffic data and develops priorities for multi-modal transportation improvements to address shortfalls in capacity, safety and accessibility.
Urban designer/architect	Assists engineers and planners in preliminary and final design of transportation projects to ensure that project design complements nearby buildings and structures.
Urban forester	Assists environmental scientists, planners and engineers by proposing strategies to preserve existing trees and finding appropriate locations for new ones when designing, constructing and maintaining transportation projects.

Every problem exists in a unique and complex context. No one person can fully understand this context or interpret its meaning. Like the story of the blind men and the elephant, one's conclusions may be very wrong if one is acquainted with only a particular part of a thing. In projects such as the US-131 S-Curve replacement in Michigan and environmental studies for the Kelly Parkway in Texas, citizen and stakeholder collaboration with state DOT practitioners resulted in significantly better decisions for all aspects of these projects.

The story of the **blind men and an elephant** originated in India. In various versions of the tale, a group of blind men (or men in the dark) touch an elephant to learn what it is like. Each one touches a different part, but only one part, such as the side or the tusk. They then compare notes on what they felt, and learn they are in complete disagreement. The story suggests that reality may be viewed differently depending upon one's perspective – that what seems an absolute truth may be relative due to the deceptive nature of half-truths.

## US 131 S-Curve Replacement in Grand Rapids, Michigan



In January 1998, the Michigan Department of Transportation (MDOT) discovered that a pier supporting a heavily traveled urban bridge had suddenly settled several inches with a resulting dip in the road surface. The bridge was part of the “S-Curve,” a raised portion of US-131 that runs through downtown Grand Rapids, Michigan and traverses the Grand River. Faced with the discovery of this serious structural damage to a major bridge located in the downtown of Michigan’s second largest city, MDOT had to decide whether the bridge could remain open. After completing emergency repairs to fill the bedrock voids that caused the pier to sink, MDOT determined that the S-Curve could safely continue in service, but that planning for a more permanent solution must begin immediately. MDOT and the Grand Rapids MPO reached an agreement to replace and improve the 1.2-mile S-Curve with more lanes, wider shoulders, and longer merging lanes.

Safety concerns raised by a deteriorating S-Curve coupled with the S-Curve’s status as the main north/south transportation corridor required that construction be completed as quickly as possible. This gave rise to an overarching project concern about potentially lengthy planning and construction schedules. The mayor of Grand Rapids was concerned that delay would create potential adverse economic impacts to downtown commercial and business interests from years of traffic congestion. As a result, the mayor, city officials, and MDOT met frequently and formed a powerful team to push for a seldom-used solution: full closure of an important urban transportation link.

In response to concerns about maintaining access to downtown and the potential for increased traffic congestion, MDOT took an extensive and transparent approach, meeting with local media, the chamber of commerce, community organizations and affected businesses to explain its plans, listen to concerns, and propose solutions to the problems raised.

Through the agency’s extensive public outreach efforts and its specific and effective responses to the transportation and commuting concerns, MDOT gradually persuaded the business community and the public that a full closure was feasible and in the best overall interests of the city and region. MDOT effectively implemented its plan with contributions from many organizations:

- The city, an adjacent university, downtown businesses, and other organizations contributed to aesthetic designs for the S-Curve structure;
- The local transit agency created a shuttle bus service to bring people into downtown;
- The State Historic Preservation Office assisted in negotiations to remove an historic building that would be demolished; and
- The State Archaeologist and staff from Grand Valley State University assisted in archaeological work on the S-Curve construction site.

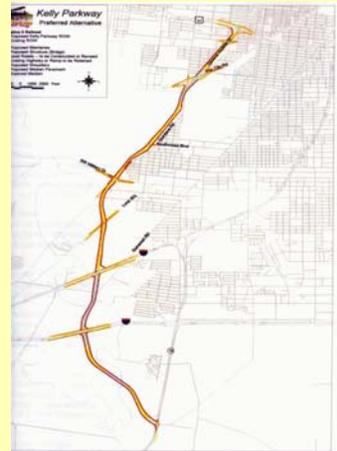
MDOT accommodated plans to fit the existing alignment in order to avoid more extensive environmental impact analysis requirements and other planning processes that would require years to complete. On October 26, 2000, 33 months after the discovery of the sunken pier, both north and southbound lanes of the new S-Curve were open to traffic. On November 15, 2000, MDOT’s project staff and other key players received a National Quality Initiative Bronze Award for their model partnership.

*Source: SHRP II C01 – A Framework for Collaborative Decision Making on Additions to Highway Capacity – <http://www.trb.org/Publications/Blurbs/169691.aspx>*

## Environmental Studies on Kelly Parkway, Texas

The Kelly Parkway project was a corridor study that looked at constructing an approximately 8.8-mile limited access highway in south San Antonio, Texas. With the closing of the Kelly Air Force Base, political and business leaders in the city viewed the project as a redevelopment opportunity for the base property and for the south San Antonio community. The highway would consist of two through lanes in each direction on a parkway-style road, connecting businesses, air, and rail facilities in south San Antonio to other major highways. By adapting pre-existing roads and constructing some completely new alignment, the Kelly Parkway would provide needed highway access to local residents, relieve truck congestion, and bring economic opportunities to the south side of the city.

All highways have community impacts. The project area was 95 percent Hispanic and had a high rate of poverty, with 34 percent of reported incomes below the poverty level. The goal was to minimize impacts on the community to the maximum extent possible by working closely with local citizens and designing a roadway that had real community benefits. The community's Hispanic heritage, socioeconomic status, and Spanish language were challenging for the project team, but they collaborated with the community to find a solution.



The level and quality of the public involvement was directly related to the funding. The level of opportunity for interaction afforded by the budget was really unique. Typically a big budget is for ads – mass outreach – not outreach at a more personal level. In this case the funding was for community outreach, and the project team could use it as they saw fit. Most interviewees pointed to the importance of the public involvement office; they noted that there is not usually funding to do that.

There was a personal aspect to the community involvement as well. In the case of Kelly Parkway, the use of context sensitive solutions meant knowing the community and being able to effectively engage them and bring them into the process. TxDOT picked their consultant strategically and developed a good team with a combination of local people who had insight into the community, as well as those who brought expertise on process and insights from elsewhere. These details and personal characteristics paid off in project efficiency. Members of the project team rode bikes through the neighborhoods and met with people one on one. It worked so well that they have been invited across the country to talk about the public involvement process and how it was made into a success against such odds. One project member said, "We participated in career days at the local middle school, and picked up trash through the neighborhoods on the weekends. We would eat breakfast with people – pulling people into committee meetings. A dozen of us had a two-and-a-half to four year commitment on the project." Another project team member remarked, "Knowing that it would be hard going into it, it did work out well. [Our TxDOT Project Manager] called it a textbook example. We got minimal comments because we covered everything early in the process." Yet another said, "The project was made almost impervious to community opposition."

Source: SHRP II C01 – A Framework for Collaborative Decision Making on Additions to Highway Capacity – <http://www.trb.org/Publications/Blurbs/169691.aspx>

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## CITIZENS' RICH PERSPECTIVES ARE INVALUABLE IN DEFINING CONTEXT

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Ultimately, no one cares more about your community and transportation choices than you do. After the professionals go home, you and your neighbors will live with the consequences. You understand many aspects of the local context not apparent to those outside the community. For example, the scenic overlook on the edge of town that every tourist visits may provide an iconic and treasured view of the beautiful surrounding landscape. Any transportation project affecting that vista should consider visual impacts from the outset.

Of course, it is naïve to speak of “citizens” as if they spoke with one voice. In fact, citizens represent many points of view, professional expertise and perspectives on community issues. Often these views are quite different and lead to tension. For example:

- Some advocates focus on “complete streets” that include bike lanes, trees and wide sidewalks to accommodate people of differing abilities; or on “traffic calming” with narrower street widths, slower speeds and speed bumps. Other advocates are concerned primarily with congestion and the need for high speed limited access roads.
- Some citizens are more familiar with how government operates and how to get things done; others bring insights from their work in the private sector.
- Some citizens may give priority to retaining and enhancing community character through protection of viewsheds and historic resources; others may think it more important to build more efficient streets and highways.
- Citizen advocacy organizations – homeowner and neighborhood associations, environmental and historic preservation groups, or even sobriety groups concerned with transportation safety – may play different roles at different stages in transportation policy, planning, project design, and operations and maintenance. For example, the national policy office of a non-profit environmental or safety organization may be most effective in working on national and state legislation; their local chapters may be most effective in monitoring project delivery and maintenance.

It can be very difficult for transportation professionals to establish a collaborative relationship with citizens where there are significant differences among groups related to the community vision, goals and priorities. When these differences represent substantial conflicts, transportation practitioners face a quandary about how to proceed. The responsibility for sorting out these differences lies with both the DOT and the community. Practitioners can establish a process that brings everyone to the table, but unless the multiple citizen voices are willing to collaborate with each other as well as with the DOT, a CSS approach will not be successful.

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## OTHER TOOLS AND TECHNIQUES CAN ALSO HELP TO DEFINE “CONTEXT.”

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***“When the only tool you own is a hammer, every problem begins to resemble a nail.”***

Abraham Maslow, Psychologist

Many tools can help define context – comprehensive plans, transportation plans, opinion surveys, visual assessments, state and local resource inventories, policy statements and much more. The information in

**Appendix B: Tools to Define Context** can help you get started. Some of these tools are intended for application early in the life of a project during visioning or planning, while others

are useful during the later stages of environmental studies or operations and maintenance. There's nothing sacred about these tools, so feel free to adapt them as you see fit or to design your own. The goal is to frame a transportation problem by understanding the context in which that problem exists.

Asking the right questions about context at the right stage in the Life of a Project will help both citizens and practitioners understand how the context should shape the approach to any transportation problem. And if the problem is well stated, it will be half solved.

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## THE PLANNING OR DESIGN CHARRETTE

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Photo source: NCI website.

The National Charrette Institute (NCI) (<http://www.charretteinstitute.org/>) defines the term *charrette* as “...a holistic, collaborative planning process that harnesses the talents and energies of all interested parties to create and support a feasible plan.” In transportation planning, a charrette led by a professional designer trained in this method of group process can bring people together early in the project planning process to consider both constraints and a range of realistic options. (See **NCI Charrette System: Stories of Community Transformation DVD**, <https://shop.charretteinstitute.org/product-p/nci-dvd.htm>)

The Charrette Center (<http://www.charrettecenter.net/charrettecenter.asp?a=spf&pfk=7&gk=261>) describes a three-step timetable for urban planning charrettes in which small groups meet in intense multi-day meetings to define plans for their communities or to work on a design for a new facility, as outlined below.

<b>Charrette Timetable</b>	
<b>INFORMATION GATHERING</b>	The design team listens to the views of stakeholders and citizens while examining the project area and its context with the help of local experts. Issue identification workshops are held to discuss issues that the stakeholders feel are important to the project. There is often a kickoff presentation the first evening.
<b>DESIGN &amp; REVIEW</b>	The design team, armed with this information, proceeds to collaborate about the best approaches for the area. Starting with general large-scale issues such as important natural features and development patterns, the debates and designs eventually evolve to fine grain issues. At regular intervals, the public is invited to review the team's progress and then give comments on what they see. These intervals are usually complete design loops in which the cycle of info gathering, design & presentation repeat.
<b>PRESENTATION</b>	The charrette ends with a final presentation of designs and findings. The presentation is highly graphic with lots of drawings that communicate the team's recommendations. A final report or design manual that summarizes and illustrates the plan and design is then assembled and delivered to the community and the charrette sponsors. This document is used to help restate the goals identified during the charrette and to supply a guiding vision during implementation.

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## VISUALIZATION AND VISUAL SIMULATION: LOOKING AT CHANGE BEFORE IT OCCURS

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Do you wish you could look at change *before* it occurs? Thanks to computer techniques known as *visualization* or *visual simulation*, you can. When applied to planning and design, visualization can sharpen public analysis and discussion, community visioning, and transportation planning by translating words into pictures and creating a common visual understanding for all participants. Unfortunately, visual simulation is still not routinely used in planning, leaving citizens with varying, and often inaccurate, images of what change will look like.

The Minnesota Department of Transportation (MnDOT) has long embraced both two-dimensional visual simulation and three-dimensional animated simulation as essential planning, design and public engagement tools. The department has established a visualization section within the agency whose mission is “...to provide computer generated renderings of proposed roadway designs. [Their] products include photo simulations as well as animations that aid in the project development process and provide a valuable communication tool for [their] clients.” (<http://www.dot.state.mn.us/visualization/>) MnDOT provided the examples on the following pages illustrating some of the possibilities for using visualization as part of the transportation decision-making process.

Photoshop can transform images so that neighbors and travelers can understand how proposed changes will affect their community and mobility. For example, a segment of State Highway 61 (London Road) at 36<sup>th</sup> Avenue in Duluth, MN (pictured below), is shown as it now exists and with one of a handful of improvement alternatives that have been explored with stakeholders and the public as part of a planning study. This particular alternative seeks to avoid adverse neighborhood impacts while improving multimodal safety and capacity within the existing London Road footprint with improved facilities for pedestrians and bicyclists; added, but narrowed, travel lanes; and intermittent raised and landscaped medians for protected left-turn lanes, pedestrian crossing refuges, and traffic calming.



Existing London Road and 36<sup>th</sup>  
Avenue, looking northeast



Visualization of 4-lane proposal  
(26<sup>th</sup> Avenue to 40<sup>th</sup> Avenue)

Pictorial representations of new facilities, such as the Wakota Bridge on I-494 between South St. Paul and Newport, MN shown below, foster greater understanding of how a proposed design will look and function in context. By establishing a common visual language, visualization encourages community participants to offer specific feedback in the early stages of design.



Visual simulation can also introduce new ways of thinking about streets, such as MnDOT's illustration of how a "Complete Streets" policy could affect a major urban thoroughfare.



Existing conditions show a street designed for cars only, with a 40 MPH speed limit, a pedestrian attempting to cross without any break in traffic, and a cyclist traveling without benefit of a marked bicycle lane.



A redesigned "complete street" alternative reallocates the existing street space to better accommodate mobility and safety for all users through narrowed travel lanes; enhanced streetscaping and traffic calming treatments; a lowered speed limit of 25 MPH; intermittent left-turn lanes; intermittent raised and landscaped medians with pedestrian refuge points; clearly-marked and visible pedestrian crosswalks with curb bump-outs and pedestrian-actuated signals; dedicated and clearly-delineated bicycle lanes; and relocation of sidewalk clutter to improve pedestrian travelways and sight lines while accommodating appropriate locations and spacing for additional pedestrian-level lighting and street trees, to fit this urban context.

Simulation is also effective for demonstrating how a new service will operate. For a new bus rapid transit line in the I-35W corridor, a QuickTime movie showed citizens how the improvements would operate prior to their completion in 2005. Both low- and high-resolution versions were available. <http://www.dot.state.mn.us/projects/brt/>

**Citizens should request visual simulation early in the collaborative process to ensure that the best technology is informing their perspectives and understanding of proposed changes.** To ensure that all simulations are accurate, trained professionals, not amateurs, should produce all simulations.

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## CHAPTER III. SHAPING TRANSPORTATION DECISIONS

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*“I’ve always been in the right place at the right time. Of course, I steered myself there.”* Bob Hope, Comedian

### Summary

- It is important to be in the right place at the right time to influence transportation decisions.
- Important transportation decisions are made at each stage in the life of a transportation project.
- Citizens, practitioners and public officials all have a role in shaping decisions.
- Inter-disciplinary teams are essential in making good decisions.

In transportation decision making, timing is everything. This chapter will help you understand the six phases in the life of a transportation project and the importance of voicing your community vision and questions about community context at each stage.

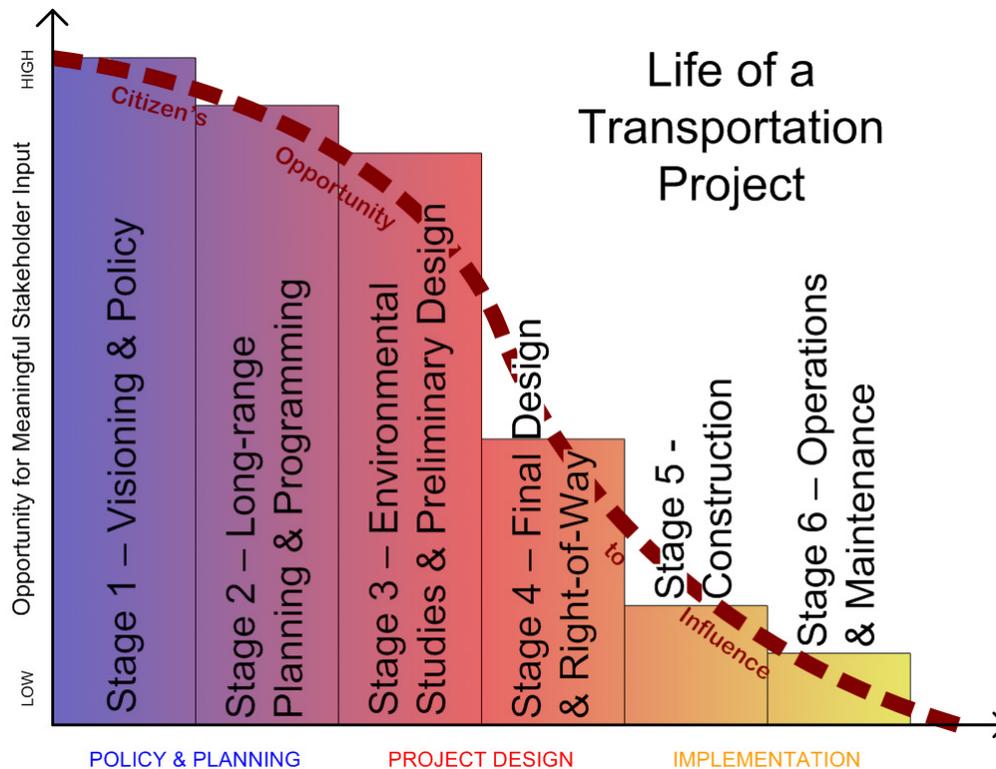
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### WHERE IS THE RIGHT PLACE? WHEN IS THE RIGHT TIME?

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As noted in Chapter I, transportation and quality of life engage in a play with six often-overlapping stages, an unfamiliar vocabulary, and many players. Lives are disrupted. Huge sums of money are charged to future debt. From the outside, transportation issues can appear impenetrable.

But transportation is not as complex as some insiders would have you believe. If you understand the basic purpose, key players, appropriate questions, resulting decisions, and desired products for each of the six stages in the life of a transportation project, then following Bob Hope’s advice to steer to “the right place at the right time” becomes easier to follow.



One of the most common and serious public complaints is that when citizens first learn that a project is taking place in their community, it is already in the design phase. Citizens feel powerless and irritated when the DOT engineer arrives with preliminary project designs before they have discussed the underlying problem the design presumably addresses. At this point, it is very late to alter the fact of a project's existence and citizens can only comment on the features of a project. To illustrate the consequences of being "late in the game":

- In **Stage #2: Planning**, it is too late to set a regional priority to expand freight rail with federal funds if freight rail is not adequately addressed in **Stage #1: Policy**. Translation: Don't blame the transportation planners if your congressional representatives fail to write national legislation that improves movement of goods by rail.
- In **Stage #3: Preliminary Design**, it is too late to give priority to transit expansion if this expansion has not been included in **Stage #2: Planning**. Translation: Don't blame the project engineer if the state DOT, local mayor and council failed to push for a well-developed transit system.
- In **Stage #5: Construction**, it is too late to bemoan the lack of tree boxes or street furniture if they were not included in **Stage #4: Final Design**.

*Citizens have the greatest influence on community transportation projects during two phases:  
Stage #2 – Long-range Planning and Programming  
Stage #3 – Environmental Studies and Preliminary Design*

At each phase it becomes progressively more difficult to reverse decisions without significant contention, messy political intervention and/or legal action. Decisions made in later stages are often driven by the direction provided in earlier stages, so it is important to ensure that issues related to these later stages, notably Stages #5 and 6, are adequately addressed in

the earlier stages. The tables below are designed to provide a succinct and understandable overview of the six phases:

- Purpose: Why is this stage important?
- Citizen's Role: How can a citizen influence decisions?
- Practitioner's Role: What are the responsibilities of the transportation professional?
- Key Decision-makers: Who makes and influences decisions?
- "Test" Questions: Will the results meet the needs of your community?
- Products and Programs: What are the products?

Becoming familiar with these tables is well worth your time. If you do not understand the process to move a project from idea to reality and identify the points where your engagement can have the greatest impact, you will almost surely be confused and disappointed by the outcome. Practitioners can also benefit from understanding those project phases in which they are not directly involved so as to collaborate more effectively with citizens during the phases when they are involved.

How can you be certain that each stage is producing decisions to carry out the intentions stated in the *Community Context*? The test questions can help you measure performance and hold decision-makers accountable for top performance.



## **Stage #1: *POLICY AND VISIONING*** **(*National, State and Local*)**

**In Stage #1, the play is just an idea in the executive producer's mind.** He/she is seeking advice from all the people who must agree to back the production, design the set and costumes and play the roles.

### ***PURPOSE***

- To establish national and state transportation goals and the means to accomplish those goals;
- In national legislation, to authorize federal funding for transportation and to establish categories of funding;
- To determine the rules of the game within the framework of existing laws or make new laws to reflect current concerns;
- To determine requirements for transportation projects to receive federal or state funding;
- To identify national and state funding priorities and apportion funding for specific project types (e.g. transit, rail, roadways); and
- To develop local/regional vision and goals for transportation as part of the overall quality of life in the community.

### ***CITIZEN'S ROLE***

- Elect national, state and local public officials who are committed to the community's quality of life, vision and transportation goals. National, state and local policies determine who will be the producer and the director of the transportation play and the money available for the production.
- Be assertive by suggesting qualified candidates and commenting on nominees for appointed administrators who will be responsible for implementing national, state and local transportation policies. Offer to serve on local committees and boards where you can have direct influence.
- As legislators create and update legislation, actively contribute ideas (both in conversation and in writing) at public meetings, in personal visits to elected representatives' offices, and through resolutions from those with special interests and expertise.
- Participate in local and regional visioning and planning. Local governments and regional planning organizations develop community vision and goals, usually as part of the comprehensive planning or land use planning process. Policies created at the local level have a major influence on land development patterns and transportation needs. Metropolitan Planning Organizations (MPOs) develop long-range transportation plans and funding allocations in urban areas. Citizen involvement in these plans—through workshops, hearings, focus groups and other means—is an important part of setting the community context, vision, values and goals.

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- Don't "go it alone." National, state and local policy is the special purview of public interest groups with paid professional staff who advocate for transportation including those representing national, state and local governments; transportation officials and professionals; public finance institutions; business/economic development interests; community planners; and advocates for environmental, historic, cultural, and scenic resource protection, bicycle and pedestrian facilities, safety, public health, "aging-in-place" and much more. Join citizen advocacy groups that represent your concerns and follow activities on their web sites. A small sample of policy advocacy groups includes:

#### **National**

- AASHTO (American Association of State Highway and Transportation Officials): <http://www.transportation.org/>
- AMPO (Association of Metropolitan Planning Organizations): <http://www.ampo.org/>
- Transportation For America: <http://www.t4america.org/>
- AARP: <http://www.aarp.org/ppi/>
- Environmental Defense Fund: <https://www.edf.org/>
- National Complete Streets Coalition: <https://smartgrowthamerica.org/program/national-complete-streets-coalition/>
- NARC (National Association of Regional Councils): <http://www.narc.org/>
- NLC (National League of Cities): <http://www.nlc.org/>
- NACo (National Association of Counties): <http://www.naco.org/>

#### **State/Regional**

- Transportation Choices Coalitions (WA): <https://www.transportationchoices.org/>
- Transit Alliance (CO): <http://www.transitalliance.org/>
- Coalition for Smarter Growth: <http://www.smartergrowth.net/>

#### **PRACTITIONER'S ROLE**

- Local, state, and federal transportation staff research emerging issues and public opinion to help provide direction to national and state policies and goals. Transportation agencies often work through professional organizations to propose policy changes.
- Few transportation staff engage directly in legislative changes.
- In some states or regions, transportation practitioners are involved in conducting/facilitating visioning processes at the local and regional levels.

#### **KEY DECISION-MAKERS**

- U.S. Congress – House and Senate, informed by the expressed interests of their constituents, staff advisors, and lobbyists
- Federal –Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Council on Environmental Quality, other federal agencies
- State – Governor, state legislature, department of transportation, air quality planning agency
- Local – Mayor, council, Metropolitan Planning Organization (MPO), local department of transportation

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## PRODUCTS AND PROGRAMS

- National legislation for surface transportation, reauthorized every five to seven years, authorizes federal transportation funding and defines funding categories. The most recent legislation is the 2005 Safe, Accessible, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA- LU) <https://www.fhwa.dot.gov/safetealu/index.htm>
- Additional federal legislation and regulations <https://www.fhwa.dot.gov/resources/legsregs/>
- Sample state legislation for surface transportation:
  - Colorado Funding Advancements for Surface Transportation and Economic Recovery (FASTER) <https://www.codot.gov/projects/faster>
  - Massachusetts Transportation Reform Law [http://www.mass.gov/bb/h1/fy11h1/prnt\\_11/exec\\_11/pbuddevcost.htm](http://www.mass.gov/bb/h1/fy11h1/prnt_11/exec_11/pbuddevcost.htm)
  - California Complete Streets Act of 2008 [http://www.leginfo.ca.gov/pub/07-08/bill/asm/ab\\_1351-1400/ab\\_1358\\_bill\\_20080930\\_chaptered.html](http://www.leginfo.ca.gov/pub/07-08/bill/asm/ab_1351-1400/ab_1358_bill_20080930_chaptered.html)
  - New Jersey Transportation Trust Fund <http://www.state.nj.us/ttfa/about/legislation.shtm>
  - Michigan Public Act 51 of 1951 [http://www.michigan.gov/mdot/0,1607,7-151-9620\\_10694---.00.html](http://www.michigan.gov/mdot/0,1607,7-151-9620_10694---.00.html)
  - Maine Sensible Transportation Policy Act of 1991 <http://www.mainelegislature.org/legis/statutes/23/title23sec73.html>

## TEST QUESTIONS TO EVALUATE POLICY

- Are national lawmakers addressing your quality of life values in transportation laws and regulations?
- Is there meaningful and continuous public participation? Does transportation legislation and policy provide the opportunity for transportation choices? Are funds flexible enough to meet local, state and national needs including transit as well as highway priorities? How are concerns for safety and efficiency addressed?
- Has your DOT or MPO adopted agency-wide policies and practices that require genuine community collaboration to ensure that community values guide decision making?
- What has been the practical experience with these policies and practices? What are the strengths? The weaknesses? Do other agency policies (such as complete streets, practical design, sustainability, streamlining, or others found on page II-6) incorporate CSS principles?
- Do your state and local transportation departments have policies that relate transportation investments to each of the quality of life factors discussed in Chapter I of this guide? Are transportation planning, programming and project development integrated into economic planning, both at the project and regional levels? Do transportation policies actively foster citizen engagement in decision making?
- What local or regional plans best communicate the community's quality of life values to the transportation agency? What quality of life values are not currently documented in an adopted plan or policy? How can citizens work with transportation agencies to address these gaps?

For more details on Policy, see Chapter I, pp.2-8 *From the Margins to the Mainstream: A Guide to Transportation Opportunities in Your Community* <http://www.wsdot.wa.gov/NR/rdonlyres/BC59E9E1-52E7-4D2F-B337-4B5F168AECFA/0/STPPGuidebooktoSAFETEALU.pdf>.



## Stage #2: LONG-RANGE PLANNING & PROGRAMMING

*Statewide Long-range Transportation Plans (LRTP)*  
*Metropolitan Transportation Plans (MTP)*  
*Rural Transportation Plans (RTP)*  
*Transportation Improvement Program (TIP)*  
*State Transportation Improvement Programs (STIP)*

In Stage #2, the executive producer develops a long-term business plan for the play, including the budget; secures financing; assembles the production team; approves the script; and hires the actors.

### PURPOSE

- To develop a variety of detailed transportation-related plans (see Products below);
- To ensure that state and local transportation expenditures for both urban and rural areas are based on plans that consider factors such as financing capacity, air quality, environmental protection and enhancement, public engagement, congestion management, bicycle and pedestrian facilities, highway safety and security, transit service, freight movement, energy conservation, and preservation of the existing transportation system, etc.;
- To require that plans be fiscally constrained to specific sources of funding;
- To ensure that these plans outline ways to improve the quality of life;
- To identify funding sources for specific transportation projects described in long-range plans that are based on national, state and local policy direction and funding priorities in Phase #1: Policy and Visioning; and
- To develop or update a fiscally constrained program of multimodal transportation projects and priorities at least every four years.

In long-range planning, citizens can have maximum influence on transportation choices and expenditures, affect the methods and frequency of citizen participation, and introduce consideration of *community context*. The state and regional policies, programs, priorities and funding determined as part of transportation planning set the stage for everything that follows in the life of a transportation project. As with the director and producers of a play in its early stages of development, both elected officials and practitioners are more receptive to alternative approaches and ideas to solve problems during this stage than they are at later stages in the life of a transportation project.

Programming means “*show me the money.*” In the transportation play, the producers (elected officials) and directors (the agency appointed officials) obtain funding commitments from the play’s sponsors and financiers (the governor, state legislatures, and city councils acting on behalf of the electorate, and bonding authorities and private equity investors acting on behalf of business investors). The “program of projects” assigns available funds to priority projects.

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### **CITIZEN'S ROLE**

- Seek participation in citizen advisory committees, obtain and comment on public participation plans, meet with transportation officials to discuss your expectations of the planning process, identify other participants, review background information and provide your perspectives. Transportation planning has steadily improved since Congress first passed the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 by requiring state and metropolitan planners to be more inclusive of the public, to offer help in community visioning and data analysis, and to serve traditionally underserved populations.
- Actively promote your Community Context and call for studies or other actions to address specific transportation problems or opportunities you have identified.
- Participate in the development of your community's "program of projects", commonly referred to as the Transportation Improvement Program (TIP) as well as the State Transportation Improvement Program (STIP). Recognize the importance of being involved in developing the TIP and STIP, since these documents prioritize specific projects. The TIP is a list of priority transportation projects and programs and their sources of funding. Projects that appear in the TIP usually, but not always, are backed by planning studies, represent the will and wishes of elected officials and set priorities for construction. Once a project is in the TIP, it becomes increasingly difficult to reverse course.

### **PRACTITIONER'S ROLE**

- Transportation planners should become thoroughly familiar with the Community Context they are representing in the transportation planning process.
- Transportation planning should reflect the transportation, community and environmental context of the specific area covered by the plan. At a minimum, transportation plans should be multi-modal, integrated with land use, and supportive of economic development and environmental planning for the area. The expertise required will vary considerably based on the size of the geographic area included in the plan and the complexity of the planning process. Some of the disciplines required are very specialized and transportation agencies often hire outside consultants to provide additional expertise.
- The role of the practitioner is (1) to develop recommended priorities for all categories of projects, (2) to balance funding allocations to meet federal and state legal and regulatory requirements, and (3) to facilitate consensus on the final TIP and STIP among diverse and sometimes competing interests of stakeholders and decision-makers.
- Competing players who have direct interests in particular projects focus heavily on the programming aspect of Phase #2. In many MPOs, state political appointees and elected officials are directly involved in setting project priorities for larger projects and some program categories, such as funding for new lanes on existing roads or new highways. Practitioners often develop project priorities for programs such as pavement rehabilitation or bridge replacements.

**Disciplines:** Integrated planning and programming requires that a broad range of disciplines be involved in transportation planning including, but not limited to:

- Economist
- Environmental planner and/or scientist

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- GIS/spatial analyst
- Landscape architect
- Land use planner
- Multi-modal planner(s) including specialists in transit, bicycle and pedestrian planning
- Public involvement specialist
- Transportation engineer
- Transportation planner
- Travel demand modeler

#### KEY DECISION-MAKERS

- **Metropolitan Planning Organizations (MPOs)** are regional transportation policy-making organizations representing local government and transportation authorities. There is an MPO for each urbanized area with a population of 50,000 or more. MPO boards are responsible for developing and approving Metropolitan Transportation Plans (also known as Long-Range Transportation Plans) and Transportation Improvement Programs.
- **Rural Planning Organizations (RPOs)** have been established in some states to serve as a regional transportation planning body for non-metropolitan areas. RPOs are typically organized and managed by a regional development organization (RDO). State laws governing RPOs vary, but generally require them to coordinate with state and local governments in developing long-range plans and programs. Decision-making authority and accountability vary from state to state based on state law (contact your state DOT for more information).
- **State** - The DOT is responsible for developing the Statewide Long-Range Transportation Plan and Statewide Transportation Improvement Program. The governor is responsible for approving the Statewide Transportation Improvement Program, although this responsibility is often delegated to the DOT or a state board/commission.

If there are air quality non-attainment areas designated within the state, the state air quality agency is responsible for ensuring “conformity” between transportation plans and the State Implementation Plan for Air Quality, essentially certifying that the plan and program will not worsen air quality in the designated areas.

- **Federal** – FHWA and FTA are responsible for ensuring that plans and programs developed by states and MPOs are in line with national policies, including planning requirements and funding restrictions. EPA must review and approve plans and TIPs for air quality conformity.
- **Interagency** – Various states and regions have formed interagency teams of transportation and environmental agencies to review and advise the DOT or MPO on potential environmental concerns during planning. Discussions can include suggestions for avoiding or mitigating environmental impacts. Often these teams include representatives from federal, state and tribal lands authorities including environmental regulatory agencies. Most commonly these are voluntary teams with decision-making authority defined by state or agency policy or interagency agreements.
- **Local jurisdictions** – Cities, counties and towns conduct land use planning and make land use implementation decisions (adoption of land use plans, zoning decisions and approval of land development). Local jurisdictions typically also have voting membership on MPO/RPO boards.

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- **Public transportation providers and operators** develop project cost estimates for public transportation improvements. Transit providers are part of the MPO transportation plan and TIP development. The transit provider participates in the MPO technical committees and policy board where the final decision-making authority is assigned.
- **Private equity partners and bonding agencies** may participate in financing large-scale projects.

### **PRODUCTS and PROGRAMS**

#### ***Common plans available from state DOT or other state agencies (names may vary by state):***

- Statewide Long Range Transportation Plan (LRTP) – required by federal legislation
- Statewide Bicycle and Pedestrian Master Plans
- Highway Safety Plan
- Freight Master Plan
- Public Participation Plan, which includes outreach mechanisms to Title VI, disabled and Limited English Proficiency (LEP) populations
- Rural Transportation Plan (RTP)
- State Transportation Improvement Program (STIP), the federally required statewide compilation of the MPOs' TIPs and the state-developed priorities for rural areas
- State Implementation Plan for Air Quality (where required)
- Wildlife and Conservation Plan

#### ***Plans available from MPO or transit agency:***

- Metropolitan Transportation Plan (MTP) or Long-Range Transportation Plan (LRTP) required by federal legislation
- Transit Service Plan
- Public Transit/Human Services Transportation Plan
- Public Participation Plan
- Congestion Management Process, required by federal regulation only in areas of 200,000+ population
- Transportation Improvement Program (TIP) for urban areas required by federal legislation that includes a description of project phasing (e.g., planning, right-of-way acquisition, design, and construction) for roadway and public transportation projects in other modes and programs.
- An air quality conformity finding, as required by federal regulations in non-attainment areas

### **TEST QUESTIONS TO EVALUATE PLANNING AND PROGRAMMING**

- Do the local, state, metropolitan and/or rural transportation plans incorporate the broad goals, priorities and direction stated in your *Community Context*? Do they consider the impacts of land use and natural resource decisions on other parts of the state or region?

(continued)

- Do the plans support a broad range of community programs (such as the Main Street program)? Do they reinforce prior public investments? Conversely, do they contain any provisions that will damage regional and local physical character and quality of life?
- Does the MPO/RPO clearly establish its own goals, tie priorities back to those goals, and include the public in generating and updating goals and objectives?
- Does the MPO/RPO acquire and incorporate the latest available data and research on transportation issues?
- Do the plans fully document air quality issues and propose strategies to address them?
- Do the plans adequately address ways to meet increasing public demand for transit and for walkable and bikeable communities?
- Do the plans recognize the importance of transportation design in achieving seamless connections between modes of travel, freight and freight intermodal connections; energy efficiency and green house gas emissions; and other environmental and community conservation priorities?
- Do the plans adopt newer technological approaches to manage traffic through Intelligent Transportation Systems (ITS)?
- How actively does the agency promote substantive, sustained public engagement? Does public participation go beyond the minimum established by federal law?
- How close and effective is the day-to-day working relationship between the MPO/RPO and state department of transportation? Is there a fair way of resolving disputes? Do these agencies consistently coordinate decisions on planning and investments?
- How well does the MPO engage the public in developing its required annual work program?
- Do the funding priorities included in the TIP or STIP reflect projects that meet high priority needs from your *Community Context*? Reflect community consensus? Follow logically from the Long-range Transportation Plan?
- How does each of the community planning and transportation agencies involve citizens in a collaborative decision-making process?
- Has the local and/or regional planning agency provided appropriate and timely information about current and future needs to the public?

For more details on Planning, see Chapter II, pp. 11-29, *From the Margins to the Mainstream: A Guide to Transportation Opportunities in Your Community*

<http://www.trb.org/Main/Public/Blurbs/156769.aspx>.



### **Stage #3: ENVIRONMENTAL STUDIES & PRELIMINARY DESIGN**

**In Stage #3, the play goes into rehearsal.** Citizens – the unpaid actors in the play – need to show that they can carry lead roles in the fast-paced dialogue about how specific transportation projects will impact community quality of life.

#### **PURPOSE**

- To identify and evaluate a full range of transportation solutions that fulfill the intended purpose and need of a transportation project as developed during Stage #2: Long-range Planning and Programming;
- To evaluate the potential human and natural environmental effects of a proposed transportation project to ensure that negative effects are avoided and/or minimized to the extent practicable, and to mitigate any negative effects that cannot be avoided;
- For road projects, to establish design criteria:
  - Design speed, which is influenced by the character of the terrain, density and types of adjacent land uses, traffic volumes and economic and environmental considerations
  - Level of service (LOS), based on the density/volume of traffic and roadway capacity
  - Vehicle mix
  - Functional classification (e.g. freeway, thoroughfare, collector, local)
  - Type of project: new construction vs. pavement resurfacing, restoration or rehabilitation;
- For other types of infrastructure (e.g. rail, bridges) to establish the preliminary design criteria; and
- For public transit, to select the service mode (bus, train, light rail, streetcar, etc.), determine route feasibility and service characteristics (e.g. headways or the distance between transit vehicles, vehicle types), station or stop locations and major amenities (e.g. preliminary station or shelter design).

The most common tasks in this phase include:

- Reviewing environmental data and information;
- Selecting a reasonable and feasible range alternatives for detailed study;
- Selecting a preferred alternative;
- Selecting concepts for preliminary design; and
- Reviewing final preliminary design.

(continued)

### **CITIZEN'S ROLE**

- Projects that have a significant impact on the community or the natural environment are required to undergo major studies to disclose the nature and extent of those impacts to citizens as well as federal, state and local agencies that have a role in transportation decisions. For these projects, the citizen's role is defined by the required public involvement plan. This plan should be developed in consultation with the community and interested parties, and it should reflect collaboration among the myriad of decision-making partners. Public involvement and stakeholder plans provide interested individuals, organizations and agencies a voice in focus groups, advisory teams, public meetings, testimony and correspondence, web discussions, etc.
- The vision of a community is only one of many factors that the practitioner must consider during environmental review and design. Transportation projects are subject to more than 40 federal laws and regulations. Primary among these is the National Environmental Policy Act (NEPA) and, depending on the context, the Clean Water Act and the Endangered Species Act. Practitioners have a difficult job in balancing the often-competing needs and requirements of the community and their natural resource protection partners. Citizen groups can perform best when they are well informed about the environmental review and laws so they understand the trade-offs that are inherent in the evaluation of potential alternatives and the selection of the final project.
- Public meetings are not required for projects that meet established criteria as having little or no impact on the environment. However, citizens can review local Transportation Improvement Programs (TIPs) and request public meetings for any project. If a formal request for a hearing is made to a state DOT, most will schedule a public hearing, though public involvement procedures vary by state.
- Environmental reviews (Environmental Impact Statements and Environmental Assessments) have received considerable criticism for looking too narrowly at an issue and for failing to identify impacts that go well beyond the immediate project study boundaries. This can be a significant problem and one that citizens should be careful to identify and call out early in the process.

### **PRACTITIONER'S ROLE**

The role of the practitioner during environmental review and preliminary design is to conduct technical studies of transportation and the environment and to provide the foundation for selecting a recommended alternative. In a CSS process, practitioners manage the decision-making process with citizen advocates and representatives of federal, state and local governments. The most common practitioner disciplines required for environmental review and preliminary design and the roles they play include:

- Natural and human environmental scientists collect and analyze data to compare different alternatives.
- Engineers develop conceptual designs for different alternatives and prepare cost estimates.
- Project managers oversee the decision-making process including coordination with federal and state regulatory agencies. They also make key decisions about public involvement strategies and decide which disciplines need to be consulted.

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- Right-of-way agents prepare preliminary right-of-way estimates to compare different alternatives.
- Land use planners look at the implications of land use for transportation and vice versa.
- Geographic Information System specialists or other spatial analysts help model data so that it is more easily understood.
- Public engagement specialists structure communications with the public.
- A wide variety of other disciplines may be required to complete technical studies to explore and document the impact on communities and the natural environment.

### **KEY DECISION-MAKERS**

Transportation project planning and design is subject to regulation by a host of federal and state agencies. The most commonly involved agencies, depending on the nature of the specific project, may include, but are not limited to:

- Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) for federally funded projects - approval authority
- State department of transportation (state DOT) for both federally and state funded projects - approval authority
- Local governments, Metropolitan Planning Organizations (MPOs), and Rural or Regional Planning Organizations (RPOs) - consultation
- Army Corps of Engineers, an agency of the U.S. Department of Defense - may be involved when subject to Clean Water Act requirements
- U.S. Fish and Wildlife Agency, an agency of the U.S. Department of the Interior when subject to the Endangered Species Act - approval authority
- Environmental Protection Agency (EPA)
- Numerous state regulatory agencies, particularly the state division of water quality and wildlife protection agencies - potential approval authority
- State Historic Preservation Officer

Contact your state DOT for more information. For a full list of potential federal agencies involved in transportation decision making, see [https://ceq.doe.gov/ceq-reports/cooperating\\_agencies.html](https://ceq.doe.gov/ceq-reports/cooperating_agencies.html)

### **PRODUCTS and PROGRAMS**

- Environmental reports describe and document the alternative selected for construction. These documents also describe the decision-making process and the technical studies that support the decision. Different types of environmental reports are required for different types of project, see: [https://ceq.doe.gov/docs/get-involved/Citizens\\_Guide\\_Dec07.pdf](https://ceq.doe.gov/docs/get-involved/Citizens_Guide_Dec07.pdf).
- FHWA or FTA approves the final alternative and issues the appropriate legal document, a Record of Decision (ROD), Finding of No Significant Impact (FONSI), or completed categorical exclusion (CE) depending on the type of environmental process required.  
[http://environment.transportation.org/pdf/linking\\_planning\\_nepa/Transportation%20Planning%20Requirements.pdf](http://environment.transportation.org/pdf/linking_planning_nepa/Transportation%20Planning%20Requirements.pdf)

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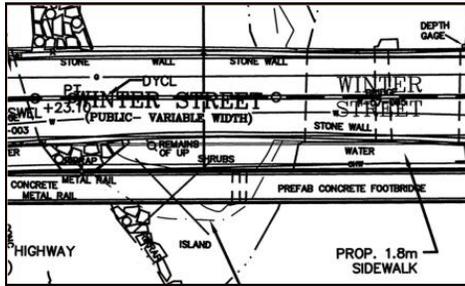
- Preliminary project design plans generally represent about 30-50% of the ultimate design requirements.

### TEST QUESTIONS TO EVALUATE ENVIRONMENTAL STUDIES & PRELIMINARY DESIGN

- How does this project fit into the priorities set forth in Phase #2, Planning and Programming?
- How do the options and alternatives reflect your *Community Context*?
- How might the project potentially affect elements of the **natural environment** – wildlife, plant life, water bodies, ecosystems such as wetlands, forests and other natural resources – and the **human environment** – social and cultural life, economy, housing and education, built environment and mobility, public health and safety, governance and public services -- might the project potentially affect?
- What are the potential natural and human environmental consequences of each alternative under consideration?
- What are the mobility goals of the project in terms of projected improvement in vehicle capacity, level-of-service or support for non-auto modes?
- What engineering design criteria are relevant to the project? Which design elements can be flexible if necessary to reduce potential impacts on the natural and human environments? (See Chapter IV. Understanding Professional Responsibility and Design Flexibility in Project Design.)
- Which federal and state laws and regulations apply to this project (e.g. wetlands, threatened/endangered species, impaired waterways, protected lands, historic structures)?
- Is this project required to undergo indirect and cumulative impacts analysis in this jurisdiction? What kind of new growth can the community expect as a result of the project?
- What has been the nature of the public engagement process and the resulting public comments? Have comments received been fully reflected in documentation of public meetings?
- How do budget realities affect which alternatives are viable?

For more information, see Chapter IV: Understanding Professional Responsibility and Design Flexibility in Project Design. See also *A Citizen's Guide to Better Streets*, Project for Public Spaces, 2008:

[https://www.pps.org/pdf/bookstore/How to Engage Your Transportation Agency AARP.pdf](https://www.pps.org/pdf/bookstore/How_to_Engage_Your_Transportation_Agency_AARP.pdf)



## Stage #4: FINAL DESIGN & RIGHT-OF-WAY

In Stage #4, the play reaches the end of rehearsals, the set designer and stagehands complete their work and everyone prepares for opening night. *The director and playwright may tweak the script, but it is too late to rewrite it.* In transportation, final design incorporates all the details for the project that will be built.

### PURPOSE

- To complete and submit final project design;
- To provide engineering drawings, calculations, plans, specifications, construction cost estimates and contract documents for a specific transportation project;
- To provide to the construction crew all of the details necessary to put the project on the ground, including the precise location of the roadway, fill and elevation, number of lanes, traffic signals, lane markings, etc.;
- To respond to comments made during the environmental review process;
- To secure real estate with purchase or agreement (including both temporary and permanent easements) for the purpose of constructing or widening a proposed transportation improvement. Property owners whose land is physically taken by eminent domain for a transportation project must be compensated the fair market value of the land; and
- To secure additional agreements, if necessary, for temporary access to an owner's property for construction and/or movement of utilities.

### CITIZEN'S ROLE

- Citizens are often engaged during this phase to provide ideas for design details such as aesthetic features or landscaping. The funding available for these final details will have been set during earlier phases but the implementation details will be determined here.
- Some state DOTs work with local businesses to develop traffic maintenance, detour or public information campaigns that will help maintain business access during construction. These plans should be developed and discussed with affected business owners during final design.
- Right-of-way acquisition is an individual contract between the DOT and the affected property owner that follows a process and requirements defined by federal and state law and regulation. If your property is affected, you will be very involved in the negotiations and legal aspects of this phase; if not, you can entrust this to right-of way practitioners at the state DOT.

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### **PRACTITIONER'S ROLE**

- Reconfirm the commitments made in the planning stage.
- Complete the design, undertake value engineering and prepare the construction contract specifications package.
- Seek any additional information from community.
- Acquire necessary right-of-way.

#### **Disciplines:**

- Architects
- Attorneys
- Engineers
- Landscape architects
- Mediators/negotiators
- Project managers
- Right-of-way agents

### **KEY DECISION-MAKERS**

- State DOT (agency in-house design review staff)
- FHWA
- Planning and environmental staff who are carrying out commitments from environmental studies
- Engineer/designer of record
- State DOT right-of-way agents
- Utility companies
- Other owners of transportation infrastructure that may include railroads, local governments, etc.

### **PRODUCTS and PROGRAMS**

- Construction drawings, plans and specifications
- Construction permits
- Engineer's estimate of project cost
- Special provisions, which should include any major construction-related commitments made to citizens during Stages #2 and 3
- Bidding proposal
- Environmental permits
- Final right-of-way plans
- Recordable property plat
- Recordable deed descriptions
- Agreements with utilities, local governments, railroads, or other affected parties

(continued)

### **TEST QUESTIONS TO EVALUATE FINAL DESIGN AND RIGHT-OF-WAY**

- Does the final design fulfill your understanding from preliminary design? Are the results of environmental review reflected?
- Does the final design show that the engineers and other professionals involved have understood the community context and the concerns raised throughout the process? For example, is the project “right sized” to fit the context – that is, neither too big nor too small, but just right? Will it serve needs as intended?
- Does the final design exhibit sensitivity to all of the relevant quality of life values including historic, cultural, scenic, built and natural environments, and mobility?
- Does the design include creative enhancements and attention to detail that lift the project from ordinary to superior?
- Did the project acquire only necessary right-of-way? Were easements considered rather than full acquisition?
- Were appropriate eminent domain procedures followed with the relevant local jurisdictions?
- If the project was federally funded, how do the regulations of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 apply to the affected properties? (See [https://www.fhwa.dot.gov/real\\_estate/uniform\\_act/index.cfm](https://www.fhwa.dot.gov/real_estate/uniform_act/index.cfm)).
- Were secondary issues, such as location of utilities and landscaping, taken into account?



## Stage #5: **CONSTRUCTION** *Show Time!*

**In Stage #5, the show is on and there is no turning back.**

### **PURPOSE**

- To build the project as planned, approved and designed during Stages #3 and 4.

### **CITIZEN'S ROLE**

- Citizen influence on construction is strongest during Stage #3 (Environmental Studies and Preliminary Design). Most state DOTs have public information programs to make citizens aware of construction activities such as road closures or detours.
- Citizen engagement can be continuous from design through construction.

### **PRACTITIONER'S ROLE**

- To manage the construction process in compliance with laws and regulations;
- To establish a safe environment for workers and the traveling public; and
- To ensure quality control and quality assurance in accordance with contract plans and specifications.

#### **Disciplines:**

- Construction inspectors
- Construction managers
- Engineers
- Landscape architects
- Project managers

### **KEY DECISION-MAKERS**

- State DOTs
- Local DOTs or public works departments

### **PRODUCTS and PROGRAMS**

- **Completed project!**

### **TEST QUESTIONS TO EVALUATE CONSTRUCTION**

- Were commitments made during environmental studies, final design and right-of-way negotiations implemented as agreed?
- Did the agency overseeing construction communicate effectively with citizens throughout the project to minimize inconvenience and surprises for the community?
- Was the project construction on schedule? Was it on budget? If not, was the agency transparent and upfront about the reasons for delay or overruns?



## Stage #6: **OPERATIONS AND MAINTENANCE**

***In Stage #6, the final stage, the transportation show becomes a big hit in the community! Over its long and successful run, crews are constantly at work maintaining the set and the costumes, and the actors continue to refresh their lines. The financiers are happy to receive returns on their investment; the producers are happy to receive awards; and the actors are happy to have work!***

### **PURPOSE**

- To operate and maintain the transportation system and the new project that is now part of that system;
- To fulfill the project's intended purpose and to ensure safe operation of the system;
- To determine the transportation problems that operational changes can address (e.g. signal timing, lane reassignment, etc);
- To use existing guidelines from FHWA and the Manual on Uniform Traffic Control Devices (MUTCD) to determine appropriate remedies for various problems;
- To implement a planned maintenance program to manage and improve the condition of the equipment, pavement, bridges and appurtenances; and
- To ensure the structural integrity and cost effectiveness of the transportation system.

### **CITIZEN'S ROLE**

- Citizen involvement is generally limited to providing feedback to the DOT on operational and maintenance problems (e.g. potholes, traffic signal outages, pedestrian or bicycle safety issues) through letters, emails or telephone calls, etc. This information about current conditions or problems is extremely valuable to the DOT. For some DOTs, this information provides data that can inform Stages #2 and 3 to improve the planning and design of future projects.
- Citizens can provide support to the DOT by recognizing the importance of maintaining the system and voicing their support for maintenance funding with elected and appointed policy makers. Citizens generally focus their attention on transportation "projects" without thinking deeply about the importance of maintaining roads and bridges once they are built. Without adding a single new lane of road or new transit vehicle to our current transportation system, a significant public investment is still required both to ensure that it is properly maintained to extend its life and provide safe traveling for the public.
- While there are few opportunities for citizens to engage with the DOT during maintenance, it is important that you alert the DOT if current maintenance practices appear to conflict with the community context or values. DOT implementation of CSS in maintenance is less common than it is in Stages #1 through #4, but there are many DOTs that have adopted a "customer focus" philosophy and are open to hearing citizen ideas and concerns about current maintenance practices.

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- For many DOTs, maintenance is significantly underfunded, so there will be limits on what a DOT may be able to do.

### **PRACTITIONER'S ROLE**

The role of the practitioner in this phase is to ensure that the system is operated and maintained to the highest standards possible with existing funding.

- Consider the community context, vision, values and plans in identifying, evaluating and implementing operational alternatives for the region, a single transportation corridor, or a local project.
- Maintenance workers “touch” the transportation system on a daily basis and provide the most frequent and visible interface with the community. Their role is to:
  - Manage the maintenance program to establish a safe environment for workers and the traveling public;
  - Establish a list of necessary repairs and compare them to the established program priorities;
  - Provide quality control and quality assurance to ensure the maintenance personnel or contractors are delivering the required product in accordance with plans and specifications;
  - Verify that repairs are performed properly and report required data accordingly for financial management purposes (man-hours, equipment usage, material usage); and
  - Evaluate the project in light of the community’s context and values and the extent to which it solves commonly-understood problems.

#### **Disciplines:**

- Intelligent Transportation Systems (ITS) specialist
- Maintenance engineer
- Maintenance staff
- Project manager
- Traffic operations engineer

### **KEY DECISION-MAKERS**

- **FHWA’s Office of Operations** provides national leadership for the management and operation of the surface transportation system. FHWA establishes national policies, recommendations and research for operational procedures as part of its short and long term programs, but FHWA does not decide what operational improvements will be implemented within a state or region.
- **State DOT, MPO and local government officials** implement specific improvements to operations. Major operational improvements are part of the plans and programs developed during Stage #2 with MPOs and State DOTs as primary decision-makers.
- **FHWA Transportation System Preservation program** provides national leadership and guidance on maintenance-related issues, but FHWA does not decide the level of funding or maintenance policy, procedures or standards that state and local governments will implement.

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- **State DOTs** are responsible for maintenance of state-owned transportation facilities. The federal government does not provide assistance to maintain the transportation system, so the allocation of funds for maintenance is generally handled through the annual DOT budget that the governor and state legislature must approve. The regional DOT offices (often called districts, divisions or regions) handle individual maintenance priorities. Each area generally has planned maintenance activities that are done on a regular cycle (e.g. tree trimming, mowing) and response-driven maintenance activities as problems arise (e.g. fixing potholes, replacing signs).
- **City or county DOT or public works departments** are responsible for maintenance of locally-owned transportation facilities.

Contact your DOT for more information on how maintenance funding is identified and approved in your state.

### **PRODUCTS and PROGRAMS**

- For FHWA, operations products include national policies, regulations, technical guidance, manuals, public information literature, National Highway Institute (NHI) courses, demonstration projects, case studies, freight databases and national standards such as the Intelligent Transportation System (ITS) architecture. These products are developed and improved on a continuous basis.
- For state DOTs, MPOs and local public agencies, products include a well operated and maintained transportation system, special procedures and programs such as emergency evacuation, communication systems, management systems, traveler and weather information systems, and traffic control.
- The Transportation Asset Management (TAM) program minimizes the life cycle costs for managing and maintaining transportation assets, including roads, bridges, tunnels, rails, equipment and roadside features. By focusing on business and engineering practices for resource allocation and utilization, officials can make better decisions based upon quality information and well-defined objectives.
- State or local boards of transportation establish an annual or biannual maintenance or asset management budget, establish maintenance policies, conduct inventories and assess conditions as they constantly change.
- Maintenance manuals provide guidance on various tasks including repair of bridges, tunnels, highways, streets, turn lanes, traffic signals, etc.
- Some state DOTs and local government public works departments issue maintenance reports or performance measures, such as:
  - Caltrans Roadway Maintenance Division: <http://www.dot.ca.gov/maintenance/index.html>
  - Washington State Maintenance and Operations Division: <http://www.wsdot.wa.gov/Maintenance/>

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### **TEST QUESTIONS TO EVALUATE OPERATIONS AND MAINTENANCE**

- Do the planned operations implement the direction and policies as provided in federal, state and local policy?
- Does the proposed project fully recognize the importance of operations during final design and construction?
- Did the state DOTs, MPOs and local public agencies consider life cycle cost of new projects, including the long-term impact on maintenance and operations budgets?
- Are maintenance and operations priorities based on data derived from management systems? Do they implement best practices?
- Are performance measures in place for operations? Do they include crash rates, mobility goals and economic conditions?
- Do the public agencies charged with system maintenance understand the community needs and context within which they operate? Do they consider how changing land uses and new development will impact maintenance plans and priorities?
- Have these agencies established maintenance priorities with the community - e.g. safety repairs, facility upgrades, etc.?
- Do elected state and local officials allocate adequate funding for maintenance?
- Do maintenance crews perform their work in a way that is sensitive to the setting – i.e. properly repair sidewalks, stripe crosswalks, locate bus shelters appropriately, fill potholes to blend in with the pavement, etc.?

**Chapter IV. Understanding Professional Responsibility and Design Flexibility in Project Design** provides additional information to help you communicate and negotiate effectively to achieve a project that best serves your community.

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## CHAPTER IV.

# UNDERSTANDING PROFESSIONAL RESPONSIBILITY AND FLEXIBILITY IN PROJECT DESIGN

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*It is better to understand a little than to misunderstand a lot.*  
Anatole France, French poet, journalist, and novelist

### Summary

- Learning about a transportation project in its earliest stages increases your chance of influencing its outcome.
- Projects should be linked to community vision, land use and the transportation context.
- Citizens should understand the transportation context as practitioners see it.
- Citizens should become familiar with both the analytical framework of engineers and the tools of the trade in transportation design.
- Citizens should understand how practitioners define their responsibilities.
- Citizens should adopt and adapt innovative tools of the trade.

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### THEY'RE DOING WHAT?

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Many community residents first learn of a specific transportation project – often road or street construction – when the DOT schedules public meetings to present design concepts (discussed in Chapter III. Stage #3: Environmental Studies and Preliminary Design). While the DOT views preliminary design as the next logical step in a long planning process, the community – perhaps not engaged until this point – may view the proposed project with surprise. Residents want to know: What is the problem the DOT is trying to solve? Have we experienced this problem? Is it too late to influence the project? Has the DOT looked at the neighborhood context and consequences of the project?

Gaps in understanding between DOTs and citizens often emerge when activities overlap between stages. This is particularly true when, in the transition from Stage #2 to Stage #3, planning and budgeting lead to design concepts and the DOT determines the level of environmental review that it wishes to conduct.

As projects move from planning into detailed project-level study and design, the players and the language change dramatically. If you want to ensure that project design takes into account your community's concerns, it is worth your time to understand better the typical roles and responsibilities of the transportation engineers involved in project design.

***A Citizen's Guide to Better Streets***, 2008 (referred to here as ***Better Streets***), written by former NJ DOT transportation engineer Gary Toth for the Project for Public Spaces, provides valuable insights into dealing with DOTs. (See link for .pdf download or to order online: [https://www.pps.org/pdf/bookstore/How to Engage Your Transportation Agency AARP.pdf](https://www.pps.org/pdf/bookstore/How_to_Engage_Your_Transportation_Agency_AARP.pdf))

To better communicate with DOTs, it is useful to adopt some of their terms and concepts, which are introduced here and developed more fully in the companion ***Practitioner's Guide to CSS*** ([https://www.fhwa.dot.gov/planning/css/key\\_references/context/practitionersguide/](https://www.fhwa.dot.gov/planning/css/key_references/context/practitionersguide/)), numerous pages of the FHWA web site, and ***Better Streets***.

Chapter I of this guide emphasizes the importance of developing both a community vision linked to land use, and a list of transportation problems with a range of alternatives to solve those problems. Community vision is critical throughout all phases of decision making, especially in Phase #3 as transportation project concepts from Phase #2 are translated into specific capital projects.

Transportation engineers propose design solutions to address both the current problems and the future pressures that transportation facilities are expected to face, particularly in light of anticipated development and traffic growth. The local comprehensive plan and other planning documents must be clear about the *context of future transportation projects*.

- Does your *Community Context* include the transportation context that links all transportation elements to documented needs? Is the *Community Context* up-to-date and reflective of the community's current goals? Is this information readily available to the agencies that construct and operate transportation facilities?
- Does your *Community Context* take into account projected land uses 20 years into the future and are these projected uses the foundation of the region's Long-Range Transportation Plan (LRTP)?
- Do the transportation projects listed in the Transportation Improvement Program (TIP) help to achieve the goals of the comprehensive plan? Are funding sources and projected schedules realistic? Is funding projected for capital as well as operations and maintenance costs? Is there a business plan for how new systems such as transit services or toll facilities will operate?



Local elected officials need to share your community vision and represent your interests with the DOT and other public agencies to ensure that the LRTP and the TIP accurately translate the *Community Context* into physical form.

Staff of the Metropolitan Planning Organization (MPO) or Rural Planning Organization (RPO) should also conduct extensive public outreach to focus on the transportation needs and the transportation context. This work is particularly important where local comprehensive planning may be weak, or where new developments in a community are not reflected in the comprehensive plan.

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#### UNDERSTAND THE *TRANSPORTATION CONTEXT* AS TRANSPORTATION ENGINEERS SEE IT

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Three major concerns figure prominently in the minds of transportation practitioners:

1. **Safety, the factor generally regarded as least negotiable:** Understand the crash rates for the transportation facility and the system as a whole, specific structural (bridge, culvert, underpass) deficiencies, and how proposed transportation improvements might reduce these problems.
2. **The role or function of a particular stretch of road in the overall transportation system:** All roads serve two functions: mobility (keeping the traffic moving) and accessibility (providing access to adjacent development), but the balance between mobility and accessibility will have a major influence on the recommended design improvements. *Better Streets* gives this example: “If a road passes through the center of a number of communities.... and is paralleled by a large highway, then you can make a good case that its function is largely local even if it is a designated state highway.”<sup>2</sup> Balancing mobility and accessibility, particularly in areas with changing land use, is a major issue for practitioners.
3. **Characteristics of traffic in the area:** Before proposing changes to a transportation corridor, both the community and the DOT need to have a common understanding of the current situation. Who is traveling on your streets? Where do they come from and where are they going? What/who causes traffic congestion? Is congestion seasonal and related to recreational travel? Is it related to daily commuter travel? Some common measures to understand traffic characteristics are traffic volume counts, commercial vehicle counts, modeled forecasts of future traffic, and surveys of trip origins and destinations.

Safety, function and traffic characteristics are key factors that describe the *transportation system*. It is when this understanding is combined with the *community’s vision for the transportation system* that we understand fully the ***transportation context***.

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#### BECOME FAMILIAR WITH THE ANALYTICAL FRAMEWORK OF TRANSPORTATION ENGINEERS

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Every institution has its own vocabulary and frame of reference. In the theater, styles and methods of acting will differ according to the play – drama, comedy, mystery, tragedy, farce or theater of the absurd, to name a few.

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<sup>2</sup> p.15, *A Citizen’s Guide to Better Streets*, 2008, Gary Toth.

In transportation, the traffic engineer's vocabulary and analytical framework are also important in understanding any specific transportation project. Several engineering concepts structure the transportation play.

**Functional classification** – Road classification directly affects road design. Functional classification organizes streets and highways into classes according to the service they are intended to provide. Individual roads and streets do not serve travel independently; rather, most travel involves movement through a network of roads with varying purposes and characteristics. Functional classification defines the part that any particular road or street should play in serving the flow of trips through the overall highway network. The general hierarchy consists of:

- Interstates
- Expressways
- Arterials (sometimes divided into principal and minor)
- Collectors (sometimes divided into major and minor)
- Local streets

Some states or localities may use a different classification system, but the intent of classifying roadway facilities by function or purpose is the same: to understand how the individual road fits into the overall highway system.

For more on the importance of functional classification see:

[www.fhwa.dot.gov/planning/processes/statewide/related/highway\\_functional\\_classifications/](http://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/)

**Design Speed** – The anticipated types of vehicles and the speed they are expected to travel on a road influence the specific features of the design geometry. Several factors influence selection of a particular design speed:

- Functional classification of the highway
- Character of the terrain
- Density and character of adjacent land uses
- Traffic volumes expected to use the highway
- Environmental considerations such as presence of wildlife, trees directly adjacent to the road, etc.



Typically, an arterial highway allows a higher design speed than a local road; a highway located in level terrain allows a higher design speed than one in mountainous terrain; a highway in a rural area allows a higher design speed than one in an urban area; and a high volume highway allows a higher design speed than one carrying low traffic volumes.

For more on the importance of design speed in transportation design:

<https://www.fhwa.dot.gov/environment/publications/flexibility/ch04.cfm>

[https://www.pps.org/pdf/bookstore/How to Engage Your Transportation Agency AARP.pdf](https://www.pps.org/pdf/bookstore/How_to_Engage_Your_Transportation_Agency_AARP.pdf)



**Level of Service (LOS)** – The *Highway Capacity Manual* defines level of service as a “performance indicator of a traveler’s satisfaction with the trip.” LOS is a grading system for the amount of congestion on a roadway or at an intersection, using the letter A to represent the least amount of congestion and F to refer to the greatest amount. For any given road or street, transportation engineers will define a target level of service somewhere in the mid-range for the peak-hour of travel with the goal of designing the

road in a way that reaches the target. LOS is measured in a standardized way but there are not hard and fast rules about LOS targets, and many areas have defined their targets to reflect local and regional goals and priorities.

LOS is typically analyzed both in terms of the existing traffic level and the projected future traffic, typically twenty years in the future. Projected growth with resulting changes in land use has a direct correlation to traffic forecasting: the more people projected to live, work and play in the immediate area, the greater the projected traffic. This in turn will impact the forecasted LOS and influence the design of the road to accommodate the additional traffic and achieve the target LOS.

LOS has been subject to considerable professional criticism in recent years because it gives higher value to single occupancy cars than to other features such as pedestrian crossings, bus stops, bike lanes and other indicators of “...a traveler’s satisfaction with the trip.” By focusing on vehicles rather than numbers of people served, current LOS methodologies often reward private over public transportation. However, LOS is an important concept to understand because it is the standard current practice that most transportation agencies use to assess roadway congestion.

**Vehicle Mix** – Different types of road users need different road designs. For example, a large truck or tour bus needs a larger turning radius than a small car. Similarly, shorter crossing distances best serve pedestrians. When intersections are designed to accommodate large vehicles, they may not take into account the needs of pedestrians and other non-motorized users who are also part of the mix. This can result in designs that accommodate vehicles well, but create unsatisfactory conditions for pedestrians and bicyclists. A well-designed facility can meet everyone’s needs by accounting for the mix of road users rather than simply the mix of vehicles.

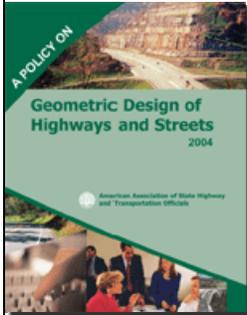
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## BECOME ACQUAINTED WITH THE TOOLS OF THE TRADE IN TRANSPORTATION DESIGN

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Transportation engineering follows a great number of mathematical and geometric formulas in recommending or determining road design. The table on the next two pages lists just a few of the engineers’ “tools of the trade.” It is important to note that these reference guides are based on extensive research and testing and may not account for new or otherwise “untested” design ideas for which information may not have been readily available at the time of publication. As a citizen, you are not expected to know or understand the technicalities of road design; however, becoming familiar with some of the basic texts that guide engineers provides better insight into their frame of reference.

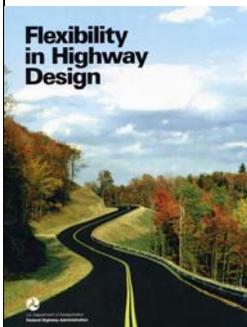
## SELECTED TOOLS OF THE TRADE FOR TRANSPORTATION DESIGN



**AASHTO "Green Book" – A Policy on Geometric Design of Highways and Streets**, 5<sup>th</sup> ed., November 2004

([https://bookstore.transportation.org/collection\\_detail.aspx?ID=110](https://bookstore.transportation.org/collection_detail.aspx?ID=110))

The *Green Book* contains the latest design practices in universal use as the industry standard for highway geometric design and serves as a guidance document for roadway design, including information on functional classification, the selection of a design vehicle, highway capacity, access management, pedestrian and bicycle facility design, safety guidelines, sight distance and curve guidelines, pavement type, lane width, shoulders, clearance, drainage, medians, frontage roads, on-street parking, interchanges, and detailed design guidelines for roadways within each functional classification. The *Green Book* provides a baseline value for use in road design, while also allowing the design engineer flexibility within an acceptable range of values.

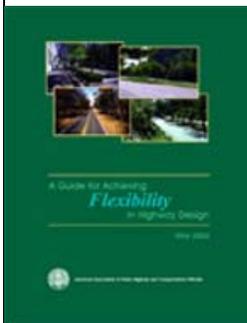


**FHWA Flexibility in Highway Design**, 1997

(<https://www.fhwa.dot.gov/environment/publications/flexibility/ch00.cfm#foreword>)

Highways need to incorporate community values – scenic, aesthetic, historic, cultural, and environmental -- and be safe, efficient, effective mechanisms for moving people and goods. Written for highway engineers and project managers who want to learn more about the **design flexibility** already available to them in the *Green Book*, this book underscores successful approaches used in highway projects. Citizens who want to gain a better understanding of the highway design process and the flexibility possible within the design process will find this

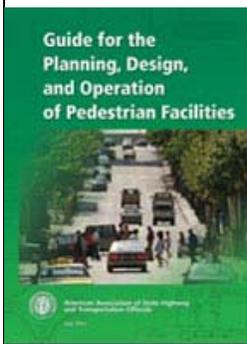
publication helpful.



**AASHTO - A Guide for Achieving Flexibility in Highway Design**, 1st Edition, 2004

([https://bookstore.transportation.org/collection\\_detail.aspx?id=31](https://bookstore.transportation.org/collection_detail.aspx?id=31))

This AASHTO Guide shows highway designers how to think flexibly, how to recognize the many choices and options they have, and how to arrive at the best solution for the particular situation or context. Flexible design does not require a fundamentally new design process and can be integrated into the existing transportation culture. This publication represents a major step toward institutionalizing CSS into state transportation departments and other agencies charged with transportation project development. In conjunction with the *AASHTO Green Book*, this provides a detailed technical resource for citizens.

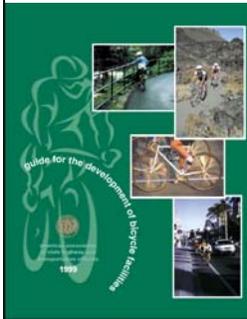


**AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities**, 1<sup>st</sup> Edition, 2004

([https://bookstore.transportation.org/collection\\_detail.aspx?id=131](https://bookstore.transportation.org/collection_detail.aspx?id=131))

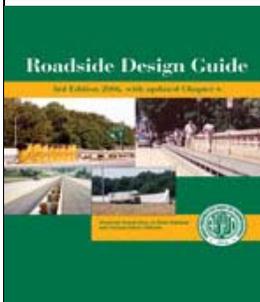
The *Pedestrian Guide* provides information on the planning, design, and operation of pedestrian facilities along streets and highways; and focuses on identifying effective measures for accommodating pedestrians on public rights-of-way. The guide also recognizes the profound effect that land use planning and site design have on pedestrian mobility. Together with the companion bicycle facility guide discussed below, the pedestrian guide is an important companion to the *Green Book*.

## SELECTED TOOLS OF THE TRADE FOR TRANSPORTATION DESIGN



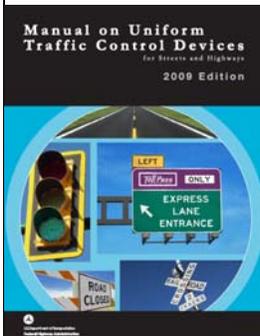
**AASHTO Guide for the Development of Bicycle Facilities, 1999**  
([https://bookstore.transportation.org/collection\\_detail.aspx?ID=116](https://bookstore.transportation.org/collection_detail.aspx?ID=116))

The *Bicycle Guide* provides information on the development of new facilities to enhance and encourage safe bicycle travel including planning considerations, design and construction guidelines, and operation and maintenance recommendations. While the guide provides information to accommodate bicycle traffic in most riding environments, it does not set forth strict standards, and instead presents principles for attaining good design sensitive to the needs of both bicyclists and other highway users.



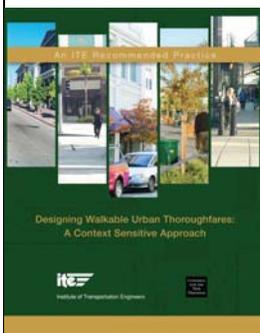
**AASHTO Roadside Design Guide, 2006**  
([https://bookstore.transportation.org/collection\\_detail.aspx?ID=105](https://bookstore.transportation.org/collection_detail.aspx?ID=105))

The *Roadside Design Guide* synthesizes current information and operating practices for roadside safety, with emphasis on safety treatments that can minimize the likelihood of serious injuries when a motorist leaves the roadway. For citizens, this guide is helpful in understanding the design decisions surrounding areas outside the pavement edge of the roadway but within the highway right-of-way.



**FHWA, ITE and AASHTO, Manual on Uniform Traffic Control Devices (MUTCD), 2009 edition**  
(<http://www.ite.org/marketplace/mutcd.asp>)

The manual defines the standards used by road managers nationwide to install and maintain traffic control devices on all streets and highways. This includes signs, traffic signals, pavement markings, railroad crossing signals and temporary traffic control.



**Institute of Transportation Engineers and Congress for the New Urbanism, Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, 2010**  
(<https://www.ite.org/css/>)

*Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*, RP-036A, was approved in 2010 as a recommended practice of the Institute of Transportation Engineers (ITE). It supersedes the proposed recommended practice, *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*, RP-036, dated March 2006. The report provides guidance to improve mobility choices and community character through a commitment to creating and enhancing walkable communities.

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## APPRECIATE HOW TRANSPORTATION PROFESSIONALS DEFINE THEIR RESPONSIBILITIES.

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It can be easy for citizens to dismiss transportation professionals as naysayers with a narrow and rigid way of thinking. But this understates the important role these professionals serve in designing projects that address a community's quality of life.

As noted in Chapter II, context-sensitive transportation planning and design engage professionals from many disciplines who are educated, trained, certified or licensed, and experienced in solving problems. Together with citizens, an interdisciplinary team can create the best transportation system possible for the community.

Decisions that transportation engineers make about functional classification, design speed, level of service and vehicle mix are based on their understanding of the transportation context. If your community's land use policies and regulations encourage future growth and fail to consider the impact of that growth on the transportation system, you should not be surprised if planners and engineers recommend bigger roads to accommodate higher volumes. But regardless of projected growth, there is no one right way to design a road or corridor.

One important aspect of professional training is learning how various state and federal laws, regulations and standards impact transportation planning and project development, and how they relate to the rules of professional conduct or ethics. Professional judgment, based on an in-depth understanding of technical issues, enables practitioners to engage in critical thinking to find solutions that can meet multiple goals and objectives.

A history of design-related lawsuits against state DOTs – sometimes even individual engineers – understandably makes practitioners want to avoid potential liability. They may believe that flexibility (deviation from standard specifications, such as those in the *Green Book*) will lead to design inconsistency confusing to drivers and will increase their risk of lawsuits. In fact, within **standard practice**, transportation engineers have considerable **flexibility in design** that both meets drivers' expectations and fulfills their legal obligations. Both FHWA and AASHTO actively promote flexibility. (See above *Tools of the Trade for Transportation Design*). Citizens and design engineers need to understand the research behind current design criteria and the emerging research regarding safety consequences of past design criteria to determine which tradeoffs make sense.

The **AASHTO Green Book** states:

“The intent of this policy is to provide guidance to the designer by referencing a recommended **range of values** for critical dimensions. It is not intended to be a detailed design manual that could supersede the need for the application of sound principles by the knowledgeable design professional. **Sufficient flexibility is permitted to encourage independent designs tailored to particular situations.** Minimum values are either given or implied by the lower value in a given range of values. The larger values within the ranges will normally be used where the social, economic, and environmental (S.E.E.) impacts are not critical.

The highway, vehicle, and individual users are all integral parts of transportation safety and efficiency. While this document primarily addresses geometric design issues, a properly equipped and maintained vehicle and reasonable and prudent performance by the user are also necessary for safe and efficient operation of the transportation facility.”

AASHTO further clarified the relationship of road design to road context in ***A Guide to Achieving Flexibility in Highway Design***, 2004:

“The ability to develop a context-sensitive solution by working within and sometimes outside design criteria, while maintaining the safety and operational integrity of the highway, requires a broad and deep understanding of the operational effects of highway geometry. For this reason, knowledgeable, experienced, professional highway engineers are essential for a successful context-sensitive project.”

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## INNOVATIVE TOOLS OF THE TRADE FOR CITIZENS

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***The secret to success is to start from scratch and keep on scratching.***

Dennis Green, NFL Coach

This is an exciting time of growth, change and choice in transportation. Over the past 20 years, communities have made clear that they want transportation to add significantly to their quality of life with innovative *context*

*sensitive solutions* – some old, some new – found both in the United States and abroad. For example:

- Roundabouts instead of traditional four-way intersections to slow traffic but keep it moving;
- Neighborhood traffic calming measures;
- Wildlife crossings under and over highways;
- Pull-offs, native plants, stone walls, wood guard rails and interpretive signage along scenic byways;
- Bridges designed to add beauty and grace to the landscape;
- A wide variety of public transit options from heavy rail and light rail to buses and streetcars; and
- “Great streets” and “complete streets” designed where all people, regardless of ability, can feel safe, walk and bike, hang out on beautiful sidewalks and have direct access to local businesses.

To help both professionals and community residents become familiar with best practices in context-sensitive solutions, FHWA, Project for Public Spaces (PPS) and Scenic America initiated a special web site in 2003: [www.fhwa.dot.gov/planning/css/](http://www.fhwa.dot.gov/planning/css/). Professionals worldwide have contributed case studies and examples of flexible design elements in practice. The site also offers webinars on many topics including sustainable communities, discussions of storm water management and water quality, training resources, performance measures, links to news about CSS projects and much more.

When citizens are educated about their choices they gain the power to be effective and well-informed collaborators in charting their future. Fortunately, there is a great deal of information widely shared both by citizens and professionals. It now seems more possible than ever that transportation can become the taproot of a community's quality of life.

**Chapter V. Going the Distance Together: Achieving Successful Projects Through Collaboration** will help you to collaborate with the DOT to design projects that fit your community.

*"A popular government without popular information or the means of acquiring it is but a prologue to Farce or Tragedy or perhaps both. Knowledge will forever govern ignorance, and a people who mean to be their own Governors must arm themselves with the power knowledge gives."*

James Madison, fourth President of the U.S. and principal author of the U.S. Constitution. (1788)

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## CHAPTER V

### GOING THE DISTANCE TOGETHER: PARTNERSHIP THROUGH COLLABORATION

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#### Summary

- Early and continuous collaboration and consensus building have many benefits.
- Collaborative partnerships achieve better project results.
- Collaboration is challenging.
- Citizens, practitioners, and decision-makers should adopt a proven method for achieving collaboration that fits the community's needs and preferences.
- Citizens and practitioners should objectively measure project outcomes, including effectiveness of process and on-the-ground solutions.

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#### BENEFITS OF COLLABORATION AND CONSENSUS

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What if *Saturday Night Live* had been a top down production instead of a brilliant and zany collaboration? What if either Rogers or Hammerstein had decided he alone would be the composer? Most of us probably agree that life is more bearable because *SNL* makes us laugh at outrageous caricature and songs from *The Sound of Music*, *Oklahoma* and *South Pacific* still resonate. Collaboration in the theater produces astonishing original results. Collaboration can do the same in transportation planning.

*Collaboration* is defined as “cooperating with others in a joint endeavor or area of mutual interest in order to influence or affect the outcome.” The goal of collaboration is consensus. Rather than simply transmitting information, collaboration requires

- Cooperation in sharing information for mutual education,
- Defining workable and acceptable alternatives, and
- Framing creative solutions.

Collaboration is the highest form of community involvement. Research shows that when citizens and professionals develop a sustained working relationship, build consensus, and communicate frequently, projects take less time and money and result in a better product.<sup>3</sup>

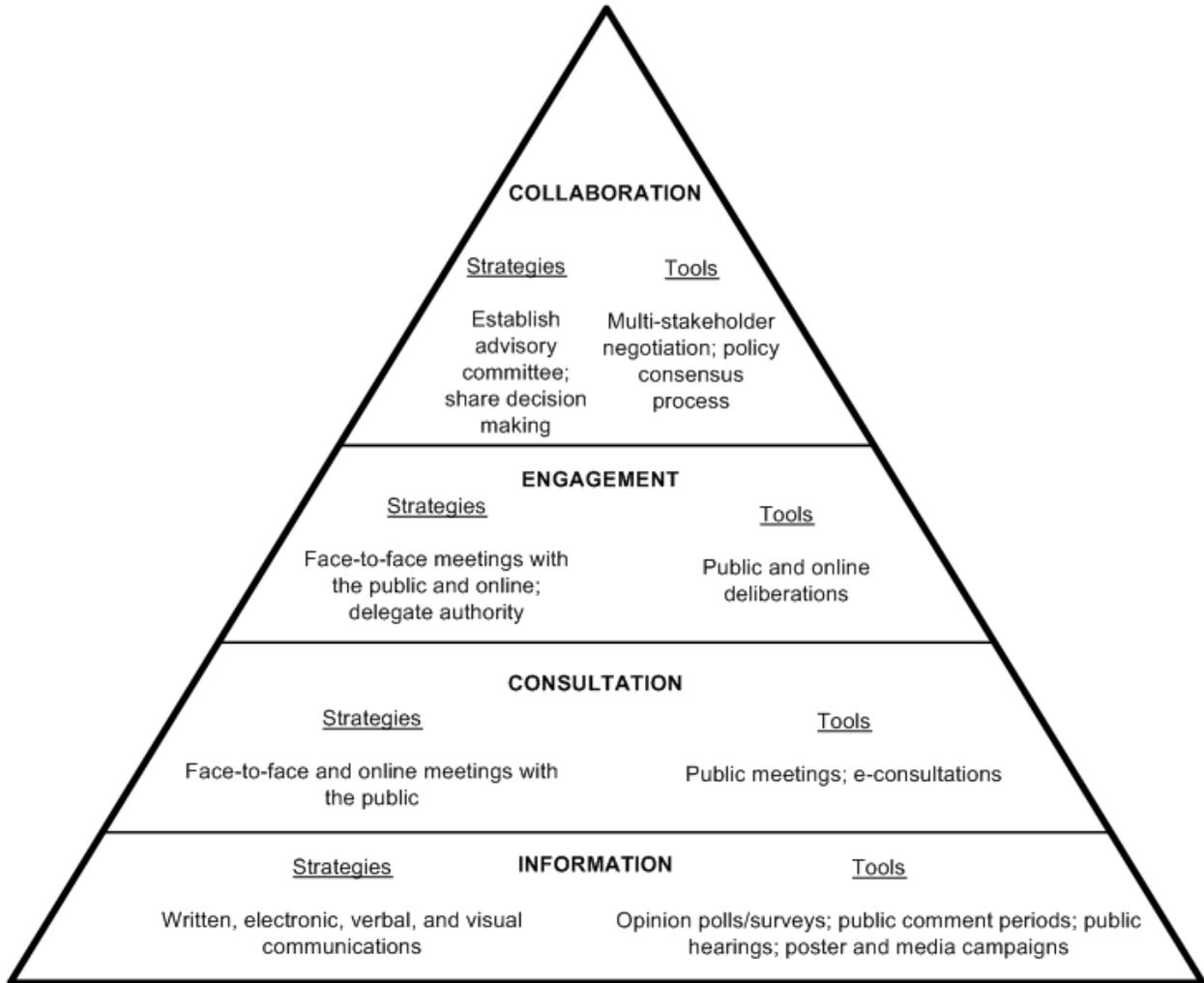
Collaboration between transportation professionals and community residents begins with the research on *Community Context*; and it ends with evaluation of project results.

***“Collaboration can re-engage citizens in the political life of the nation by giving them a real stake in outcomes and, as a result, reverse long-term declines in political and civic engagement. Such effects are not trivial, as they lie at the heart of a thriving nation.”*** Source:  
Adapted from *Public Deliberation: A Manager's Guide to Citizen Engagement*. Carolyn J. Lukensmeyer, Lars Hasselblad Torres, 2006.  
<http://ncdd.org/rc/wp-content/uploads/2010/06/CIL-PublicDelibManagersGuide.pdf>

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<sup>3</sup> See Appendix C for research on effectiveness of CSS.

## Levels of Public Involvement



Collaboration implies that everyone understands and respects everyone else's points of view. Such was the case where MaineDOT heard local concerns that changes to the Midcoast section of Route 1 should retain the character of the community.

**Case Study: MaineDOT and Local Communities Engage to Retain Community Character** Source: Adapted from Transportation Research Board, NCHRP Project 8-36, Task 86 Final Report, *Corridor Approaches to Integrated Transportation and Land Use*. (June 2009).

[http://onlinepubs.trb.org/onlinepubs/archive/notesdocs/NCHRP08-36\(86\)\\_FR.pdf](http://onlinepubs.trb.org/onlinepubs/archive/notesdocs/NCHRP08-36(86)_FR.pdf).

Route 1, a regional arterial and economic lifeline for the mid-coast of Maine, was reaching capacity as the population grew and development accelerated. Initially, MaineDOT wanted to widen the arterial, but mid-coast residents wanted a more collaborative approach that would focus planning on retention of community character along the corridor as a whole.



In response, MaineDOT initiated the Gateway 1 process, a long-term strategic planning project for the Midcoast Route 1 region that combined local land use and state-based transportation planning. The goal of Gateway 1 is to “preserve mobility while enhancing safety, transportation choice, economic strength, and quality of life along the corridor.” In the first phase of the project, MaineDOT concentrated on

establishing trust with the communities along the corridor so there would be support during the planning process. In the second phase, an action plan with various scenarios was developed to encourage local implementation. Project implementation is underway and local communities are adopting the Gateway 1 plan into local plans.

MaineDOT’s willingness to collaborate with the localities has created a multidisciplinary work environment that fosters consensus building and negotiating skills to balance transportation, environment and neighborhood development. The agency’s refusal to rush the process left all participants feeling that Gateway 1 had been a wise investment of time and resources.

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## COLLABORATIVE PARTNERSHIPS ACHIEVE BETTER RESULTS

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***“The way a team plays as a whole determines its success. You may have the greatest bunch of individual stars in the world, but if they don't play together, the club won't be worth a dime.”***  
Babe Ruth

Successful projects – those that fit within the community context and meet high priority needs – are increasingly tied to collaboration between citizens and interdisciplinary teams of transportation professionals. As noted in the Introduction, citizens and transportation practitioners do not necessarily define the goals of a policy or a project in the same way. This makes it ever

more important that they work together from the outset to understand each others’ perspectives and to achieve the best possible outcomes for all parties.

A growing body of research suggests that true collaboration can improve virtually all aspects of a project including:

- Project delivery
- Public trust
- Preparation for maintenance and operations of the new facility
- Environmental, economic and social equity
- Cost-effectiveness

- Leveraging additional financing from non-traditional sources
- Safety and mobility for all users
- Quality of life and economic development

In Chattanooga, TN, intense citizen/professional collaboration achieved ownership and benefits for the project beyond all expectations.

### **Collaboration on the Chattanooga Riverfront Parkway Leads to Financial Partnership**

*(Source: SHRP II C08: Linking Community Visioning and Highway Capacity Planning, The Louis Berger Group, 2009.)*

Collaboration creates an opportunity and place for people to come together to address issues and solve problems without predetermining the outcome. The City of Chattanooga adopted this approach in producing the 2001 Riverfront Parkway Transportation and Urban Design Plan as one piece of a larger city-wide effort for revitalization that began in the 1980s with comprehensive visioning about community context and quality of life.

The major tenets of the Plan emerged from an intensive three-day collaborative workshop. The sponsor, The RiverCity Company, a private not-for-profit organization focused on downtown Chattanooga revitalization projects, managed and financed the Riverfront Parkway Transportation and Urban Design Plan. Those participating included officials from the City of Chattanooga and Hamilton County, state and federal agencies, area foundations, the Tennessee Department of Transportation, the University of Tennessee, the Chattanooga Fire Department, Siskin Hospital, Friends of the Festival, adjacent property owners and companies that use Riverfront Parkway to move freight.

The plan resulted in the redesign of Riverfront Parkway from a high-speed access-limited highway to a true waterfront street that brings value to downtown and provides local community access. With approximately \$68,000 in consultant fees, RiverCity's time, and volunteer time from the mayor and stakeholders, the RiverCity Company and Mayor Bob Corker were able to leverage their consensus to secure \$60 million in private and foundation contributions – about half of the total funding needed -- to finance the rerouting of Riverfront Parkway, developing new housing and creating new green spaces and public art along the waterfront. The remaining \$60 million was financed through debt backed by revenue anticipated over time through a new hotel/motel tax. These improvements in turn attracted hundreds of millions of dollars in new downtown and waterfront investment. Implementation of the Riverfront Parkway Transportation and Urban Design Plan led directly to the creation and implementation of the 21st Century Waterfront Plan, a \$120 million investment in further riverfront revitalization.

The collaboration created a real sense of ownership that led to a public-private financial partnership and model for under-funded state departments of transportation. The conversion of the Parkway is nationally regarded as one of the most successful community-led transformations of outdated highway infrastructure into a catalyst for rebirth of a medium-sized city.



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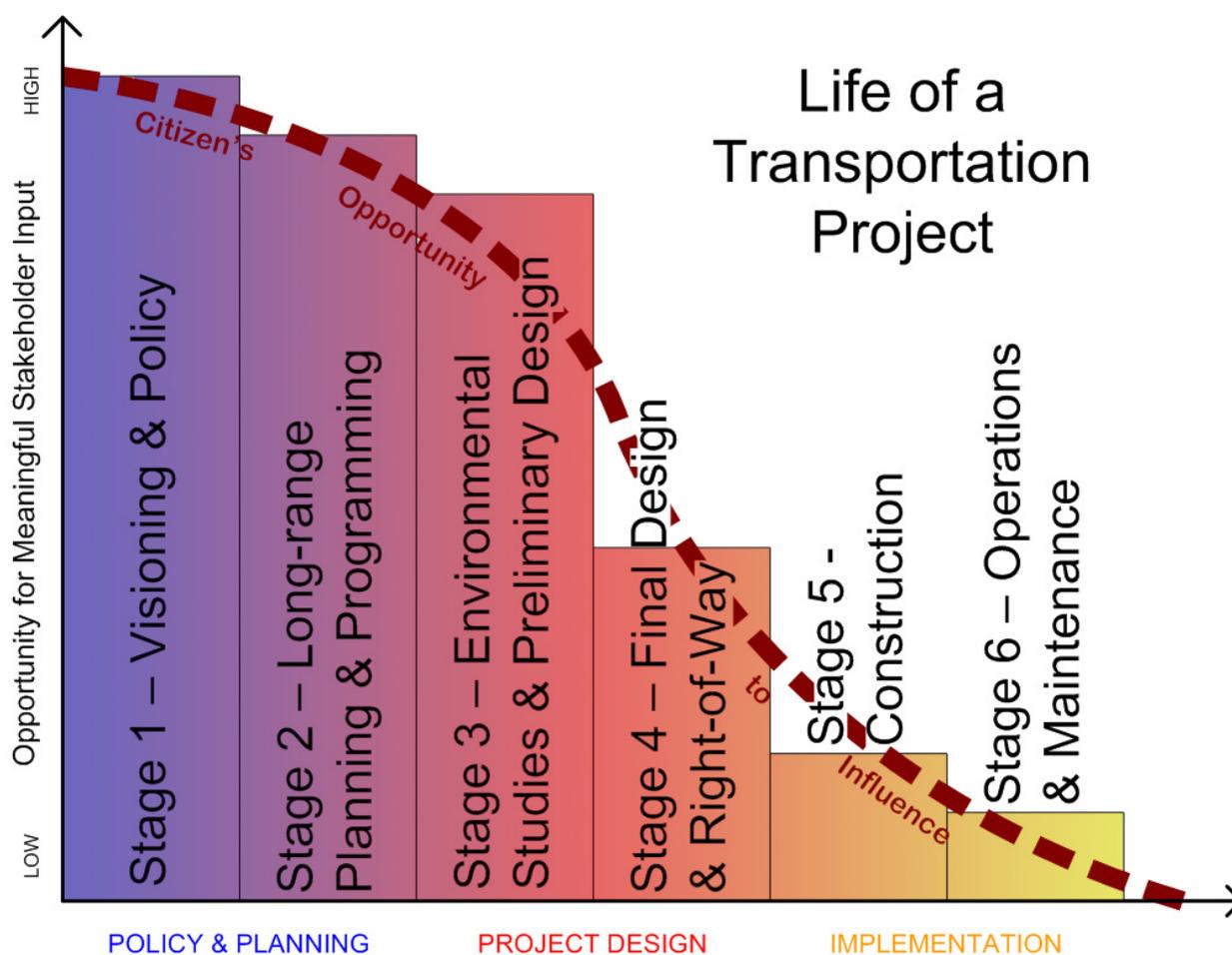
## COLLABORATION IS CHALLENGING

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As noted in Chapter I, citizens bring many agendas and points of view to the table depending on their relationship to the project. They may be beneficiaries, positively affected by the project; neighbors adversely affected by the project; agencies with regulatory authority; or advocates for the environment, safety, accessibility or other interests.

While everyone may support the idea of collaborating with the DOT, some may not want to play by the rules of open and transparent collaboration.

To be credible and effective, collaboration needs to take place at the time when it will have the greatest meaning. The graphic below shows the general relationship between the six stages in the life of a transportation project and the opportunities available for meaningful stakeholder engagement. As shown, citizens and other stakeholders have opportunities to participate throughout the transportation decision-making process, but they have the most opportunities to influence outcomes when they are involved in the early stages.



Collaboration is possible at all phases of decision making, as shown in Chapter 3, starting from policy creation to daily operations and local maintenance. Stage #1 - Policy and Visioning presents an opportunity for stakeholders to influence “big picture” decisions, but those made at this stage do not generally deal with specific projects. The two phases that are particularly well-suited to solicit incorporate public involvement on specific plans and projects are Stage #2 - Long-range Planning & Programming and Stage #3 - Environmental Studies & Preliminary Design. These stages are ripe for collaboration on transportation decisions. Stages #2 and #3 provide significant opportunity for collaboration among those with different perspectives, information and data.

If collaboration were easy, then everyone would do it on all transportation projects. But just because it is not easy does not mean it is not worth pursuing. Some common barriers to collaboration may seem insurmountable at first, but really are solvable. A few recurring challenges to collaboration include:

Different communication styles

Different decision-making styles

Different attitudes toward conflict

Different attitudes toward disclosure

Different approaches to completing tasks

Different approaches to knowing

Resource Link: <http://www.pbs.org/ampu/crosscult.html>

#### What Keeps Us Apart?

- **“I am an Island.”** As social diversity and globalization impinge more deeply, individuals and groups struggle to assert their own selfhood and identity. To this end, they develop their own sets of principles, values, approaches and solutions that can easily become rigid. We define ourselves in a certain way and everything else is “something else.”
- **“Them and Us.”** We have few processes that unite rather than divide us. We have developed the tension between opposites into a high art form. We see ourselves as right, and others as simply wrong, or at best, inadequate. We are not trained to see two, three or four sides of an argument at the same time.
- **“Let’s Get Together and Fight.”** Any interchange over any topic is traditionally approached as a debate, and we are unable to come to consensus. No wonder we experience an increasing inability to come to consensus. Trying to resolve a dispute with another dispute, even disguised as mediation, is not likely to create lasting solutions. Disharmony prevails and we scratch our heads in wonder.
- **“I Heard What I Said.”** We report on many conversations by telling people what we said. Truly hearing a different perspective is not easy when the roar of our own thoughts drowns out everything else. Individuals and groups retreat to their own bunkers, not listening to anything else. Ships pass in the night.
- **“Who’s Got the Power?”** All too often, our relationships and social systems are based on power relationships. Resolving difficulties and making decisions has become a matter of gaining or manipulating enough power to have one’s own way. Few understand how to use power to harness other people’s creativity so that it benefits everyone.
- **“We Need to Find a Solution and I’ve Got It.”** We tend to approach a lot of our conversations with our positions fixed. We arrive with answers rather than questions. It is difficult to take the conversation beyond the positions that individuals bring to the table. If the door is closed, the door is closed.

*Adapted from: Facilitating Conciliation, The Canadian Institute of Cultural Affairs, 2000*

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## ADOPT AND ADAPT PROVEN METHODS FOR COLLABORATION AND CONSENSUS-BUILDING

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Collaboration and consensus building are both important and difficult to achieve. Proven methods warrant adoption and adaptation to suit. When conversations lack structure, there is often no way to ensure that each person's thinking patterns and insights will be available to the group. Conflict, chaos and discouragement can result.

Techniques to achieve collaboration and consensus include:

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### ***FACILITATED DISCUSSIONS***

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Facilitated discussions are those conversations and meetings that employ facilitators. The term "facilitator" means *a person who makes progress easier*. Facilitators are trained to remain neutral and focus on working with the group to achieve consensus or progress by building trust among group members. Facilitators are trained in a variety of methods to structure group discussion, to reduce conflict and to promote mutual understanding and respect.

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### ***FOCUSED CONVERSATION METHOD (SOURCE: INSTITUTE OF CULTURAL AFFAIRS)***

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Focused conversation is a method of exploring many facets of a question in order to design the most effective solution. People work in groups to answer questions on four different levels: objective, reflective, interpretive and decisional (<http://www.ica-usa.org/>). A facilitator or a group member can lead the conversation, drawing on the wisdom of each member of the group.

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### ***INTERACTIVE ANALYSIS***

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Interactive analysis includes a whole suite of tools that allow practitioners and citizens to investigate different aspects of a problem or a proposed solution. If a basic visioning process is the end product, low-tech brainstorming approaches may work. If it is a large-scale plan, scenario planning or geographic information systems (GIS) may be useful. If it is a specific project, then visualization tools can make the project come to life through design sketches, computer visual simulation, videos or scale models. These tools make accessible to the public more difficult concepts like differences in lane widths.

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### ***MEETING IN A BOX***

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"Meeting in a Box" is a self-guided and individually-hosted workshop that can be presented by any club, service organization, neighborhood group or group of friends in one's home. Professional facilitators who ran a series of small group meetings in Aspen, Colorado's community visioning developed the materials in the box including multi-media tools. This method is more free-form and appealed to a wide range of people. Additionally, participants found it attractive to hold an informal meeting in an environment where everyone could feel

#### **What's in the Box?** *(From Aspen, CO)*

1. Instructions
2. A set of 10 colored cards shows one of 10 topics and provides some background information on each topic (your group can decide to focus on any topic you wish, or 3 or 5 or all 10)
3. A document titled "How To Build Your Vision," which includes prompting questions that ask you to envision the area 10 or more years from now
4. Pens and notepads
5. Popcorn for you and your group

comfortable with friends, neighbors and peers. This promoted open dialogue more satisfactorily than in a traditional public meeting. The organizers gained valuable information and public opinion to better understand the context of the project.

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**SOCIAL MEDIA**

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Social media involves a whole host of evolving online communication tools that are accessible to the public. This may include items for public involvement such as:

- Information distribution through general list serves, podcasts and audiocasts, and RSS feeds;
- Consultation through online surveys, blog dialogues, Facebook/Twitter, etc.;
- Engagement through wikis on activities such as public photo contests, etc.; and
- Collaboration through an online community to complement traditional public meetings.

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**ADDITIONAL RESOURCES FOR COLLABORATION METHODS AND STRATEGIES**

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<b>Minnesota Department of Transportation, “Hear Every Voice” Public and Stakeholder Participation Guidance</b>	
Link	<a href="http://www.dot.state.mn.us/publicinvolvement/mndotemployees.html">http://www.dot.state.mn.us/publicinvolvement/mndotemployees.html</a>
<b>Michigan Department of Transportation, Guidelines for Stakeholder Engagement</b>	
Link	<a href="http://www.michigan.gov/documents/mdot/MDOT_Guidelines_For_Stakeholder_Engagement_264850_7.pdf">http://www.michigan.gov/documents/mdot/MDOT_Guidelines_For_Stakeholder_Engagement_264850_7.pdf</a>
<b>New York State Department of Transportation, Public Involvement Manual</b>	
Link	<a href="http://environment.transportation.org/pdf/context_sens_sol/PublicInvolvementManual.pdf">http://environment.transportation.org/pdf/context_sens_sol/PublicInvolvementManual.pdf</a>
<b>Florida Department of Transportation, Public Involvement Handbook</b>	
Link	<a href="http://www.fdot/environment/pubinvolvement.shtm">http://www.fdot/environment/pubinvolvement.shtm</a>
<b>FHWA, Public Involvement Techniques for Transportation Decision Making</b>	
Link	<a href="https://www.fhwa.dot.gov/planning/public_involvement/publications/pi_techniques/">https://www.fhwa.dot.gov/planning/public_involvement/publications/pi_techniques/</a>
<b>Environmental Protection Agency Tools for Public Involvement</b>	
Link	<a href="https://www.epa.gov/superfund/community-involvement-tools-and-resources">https://www.epa.gov/superfund/community-involvement-tools-and-resources</a>
<b>Cultural Affairs’ Technology of Participation Courses</b>	
Link	<a href="http://www.ica-usa.org/?page=topnetwork">http://www.ica-usa.org/?page=topnetwork</a>
<b>International Association for Public Participation</b>	
Link	<a href="http://www.iap2.org/">http://www.iap2.org/</a>

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MEASURE PROJECT OUTCOMES INCLUDING EFFECTIVENESS OF PROCESS AND ON-THE-GROUND SOLUTIONS

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***The ultimate test of CSS is whether it succeeds in producing a result that:***

- Solves transportation problems without creating new problems;
- Respects physical context and community values;
- Enhances quality of life including public health, safety and welfare;
- Makes effective and efficient use of all resources including professional and citizen involvement; and
- Satisfies the majority of the stakeholders involved in the process.

Transportation project development and delivery benefit greatly from outcome assessment. Understanding what went wrong – and what went right – can lead to better policies, processes and procedures that cut costs and time to complete. Measuring how well a particular solution functions in real-world conditions in terms of its safety, mobility and accessibility can provide valuable precedence for future projects. Quantitative measures of project performance can also be developed for each aspect of quality of life, such as measures of social, economic and health impacts.

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PUBLICATIONS ON RECOMMENDED CSS PERFORMANCE MEASURES

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<b>Quantifying the Benefits of Context Sensitive Solutions (NCHRP Report 642, Project 15-32, 2009)</b>	
Link	Report: <a href="http://www.trb.org/Publications/Blurbs/162282.aspx">http://www.trb.org/Publications/Blurbs/162282.aspx</a> . Appendices: <a href="http://www.trb.org/Publications/Blurbs/Quantifying_the_Benefits_of_Context_Sensitive_Solu_162282.aspx">http://www.trb.org/Publications/Blurbs/Quantifying_the_Benefits_of_Context_Sensitive_Solu_162282.aspx</a>
<b>Performance Measures for Context Sensitive Solutions – A Guidebook for State DOTs (NCHRP Document 69, 2004)</b>	
Link	<a href="http://www.trb.org/publications/blurbs/155207.aspx">http://www.trb.org/publications/blurbs/155207.aspx</a>
<b>Guidelines for Environmental Performance Measurements (NCHRP Project 25-25, Task 23, 2008)</b>	
Link	<a href="http://onlinepubs.trb.org/onlinepubs/archive/NotesDocs/25-25(23)_FR.pdf">http://onlinepubs.trb.org/onlinepubs/archive/NotesDocs/25-25(23)_FR.pdf</a>
<b>Non-traditional Performance Measures: AASHTO Peer Exchange Series on State and Metropolitan Transportation Planning Issues (NCHRP Project 8-36 (53)(2), 2006)</b>	
Link	<a href="http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1267">http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1267</a>
<b>Washington State DOT Accountability and Performance Information: Gray Notebook. Includes a variety of traditional and nontraditional performance measures.</b>	
Link	<a href="http://www.wsdot.wa.gov/Accountability/">http://www.wsdot.wa.gov/Accountability/</a>
<b>Florida DOT Mobility Measures</b>	
Link	<a href="http://www.fdot.gov/planning/statistics/mobilitymeasures/">http://www.fdot.gov/planning/statistics/mobilitymeasures/</a>

<b>Florida DOT Evaluation of the Effectiveness of Public Involvement Programs (from the Public Involvement Handbook)</b>	
Link	<a href="http://www.fdot.gov/environment/pubs/public_involvement/PIPMFinalReport06-26.pdf">http://www.fdot.gov/environment/pubs/public_involvement/PIPMFinalReport06-26.pdf</a>
<b>New Mexico DOT “Guide to Context Sensitive Solutions.” 2006. Incorporates measures for each phase of project development including operations and maintenance.</b>	
Link	<a href="http://www.dot.state.nm.us/content/dam/nmdot/Research/NM05DSG01GuideContextSensitiveSolutions2006.pdf">http://www.dot.state.nm.us/content/dam/nmdot/Research/NM05DSG01GuideContext SensitiveSolutions2006.pdf</a>
<b>PennDOT and NJDOT “Smart Transportation Guide.” 2008. Includes discussion of the quantifiable benefits of smart transportation.</b>	
Link	<a href="http://www.state.nj.us/transportation/community/mobility/pdf/smarttransportationguidebook2008.pdf">http://www.state.nj.us/transportation/community/mobility/pdf/smarttransportationguide ebook2008.pdf</a>
<b>State DOT Performance Measurement Library</b>	
Link	<a href="http://www.wsdot.wa.gov/Accountability/Publications/Library.htm">http://www.wsdot.wa.gov/Accountability/Publications/Library.htm</a>
<b>“Community and Social Benefits of Transportation Investment.” January 2002. NCHRP Project 8-36, Task 22 Demonstrating Positive Benefits of Transportation Investment.</b>	
Link	<a href="http://onlinepubs.trb.org/onlinepubs/archivenotesdocs/NCHRP08-36(22)_FR.pdf">http://onlinepubs.trb.org/onlinepubs/archivenotesdocs/NCHRP08-36(22)_FR.pdf</a>
<b>“Performance Measurement Framework for Highway Capacity Decision Making.” 2009. SHRP CO2 Capacity Project</b>	
Link	<a href="http://onlinepubs.trb.org/onlinepubs/shrp2/shrp2_pb_c02_a.pdf">http://onlinepubs.trb.org/onlinepubs/shrp2/shrp2_pb_c02_a.pdf</a>
<b>“Integrating Context Sensitive Solutions into Transportation Practice.” 2009. FHWA.</b>	
Link	<a href="https://www.fhwa.dot.gov/planning/css/key_references/integrating/index.cfm">https://www.fhwa.dot.gov/planning/css/key_references/integrating/index.cfm</a>

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## CONCLUSION

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Quantifying quality of life benefits resulting from CSS is difficult. To be most effective, the transportation agency, in collaboration with citizens, should establish performance measurements at the outset of the project, before a project begins, rather than after the fact. Collecting information during the project using pre-established criteria is less costly and more likely to be accomplished than doing so later when the project team has dispersed.

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## AFTERWORD

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### GO THE DISTANCE IN YOUR COMMUNITY

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The end of this guide is just the beginning of what may become your new passion: ***transportation advocacy***.

Many ordinary citizens have become hooked on improving the physical infrastructure and quality of life in their communities. They gain satisfaction from understanding and tackling the challenges of complex interdisciplinary problems, learning from new colleagues and friends, and working with others to solve real-world problems.

Ensure that your DOT adopts CSS as both an agency policy and an everyday practice. As new political appointees come and go at the top of the agency, let the leadership know that you expect to be a collaborative partner in shaping transportation policies and projects in your community.

Join others to “go the distance” on a journey of great civic benefit!

***“Never doubt that a small group of thoughtful  
committed citizens can change the world.  
Indeed it’s the only thing that ever has.”***

Margaret Mead



## **Appendix A**

### **Practitioner Disciplines Involved in Transportation Decision Making**

The table on the following pages provides information on many practitioner disciplines involved in transportation, including professional training and certification requirements, the contribution of the discipline to defining the context of a transportation project, typical engagement in the phases of transportation decision making, and links to sample work products related to the discipline.

## Practitioner Disciplines Involved in Transportation Decision Making

### ARCHAEOLOGIST



*Professional Training and Certification:* Professional archaeologists typically have at least a Masters Degree in archaeology or anthropology, and some have a Ph.D. as well. Archaeologists can optionally apply to be a Registered Professional Archaeologist (RPA). RPA's are held to a Code of Conduct and Standards of Research Performance:

<http://rpanet.org/?page=CodesandStandards>. Federal regulations (36 CFR 61) define the minimum requirements for archaeologists conducting work on projects receiving federal funding:

[https://www.nps.gov/history/local-law/arch\\_stnds\\_9.htm](https://www.nps.gov/history/local-law/arch_stnds_9.htm)

*Contribution to Understanding and Defining the Context of a Transportation Project:* Archaeologists are typically involved in a transportation project in three circumstances: (1) to assist in the determination of a preferred alignment if the location of a proposed transportation project intersects or is near a known archaeological or cultural resource, and during construction to minimize or mitigate impacts to historical artifacts; (2) when, during construction, evidence of previously unknown historical artifacts is discovered, to take immediate steps to mitigate damage and/or move the artifacts; (3) to determine where the probability of archaeological sites may be high and perform investigations to determine the presence of sites.

*Stages of Transportation Project:* #3 (Environmental Studies and Preliminary Design), #5 (Construction), #6 (Operations & Maintenance)

*Work Samples:* Delaware DOT Cultural Resources – Archaeological/Historical Preservation (<http://www.deldot.gov/archaeology/>); Tennessee DOT Environmental Planning and Permits Division, Archaeology Section (<http://capone.mtsu.edu/kesmith/TNARCH/tdot.html>)

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## Practitioner Disciplines Involved in Transportation Decision Making

### BUDGET/FINANCE PROFESSIONAL



*Professional Training and Certification:* Training and certification for budget and finance professionals varies. Many of these professionals have backgrounds in accounting, although some may also have studied in other related fields, such as business administration or economics. One potential certification is the Certified Public Finance Administrator (CPFA) from the Association of Public Treasurers of the United States and Canada.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Budget/finance professionals provide valuable insight during the planning and programming phases. As part of the long-range planning process, forecasts of expected revenues play an important role in ensuring that planned projects can realistically be funded within the timeframe of the plan. Programming requires detailed analysis of expected costs and revenues within a several-year period.

*Stages of Transportation Project:* #2 (Long-range Planning & Programming)

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## Practitioner Disciplines Involved in Transportation Decision Making

### CONSTRUCTION ENGINEER



*Professional Training and Certification:* A construction engineer (or resident engineer) is a specialized type of civil engineer. Many states do not require a construction engineer to be licensed since he or she is required to strictly follow the construction plans approved by the licensed Professional Engineer.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Construction engineers oversee work that is conducted in the field, ensuring that the design engineer's plans are followed accurately, infrastructure meets safety standards, and pavement conditions are adequate. Their understanding of context can help them lessen the negative impacts of construction and maintenance activities on the community, such as altering work hours to accommodate school traffic, working with urban foresters to protect culturally significant trees near construction, ensuring that environmental and other specifications are followed, or making sure pedestrians can easily reach local businesses.

*Stages of Transportation Project: #5 (Construction)*

Note: Construction engineers should be consulted during planning, programming, design and operations.

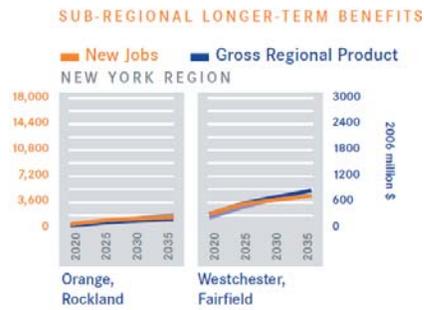
*Work Samples:* King County (WA) Road Services Division

<http://www.kingcounty.gov/transportation/kcdot/Roads.aspx>

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## Practitioner Disciplines Involved in Transportation Decision Making

### ECONOMIST



*Professional Training and Certification:* Most professional economists have a PhD in Economics, though some may have only a Bachelors or Masters degree.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Economists can provide useful information to help engineers and planners understand the economic impacts of transportation projects on communities. For example, many transportation projects are explicitly intended to enhance the economic development of a community by improving access and providing opportunities for development in a previously undeveloped area (called Indirect and Cumulative Impacts, or Induced Growth). Understanding the potential economic costs and benefits of a project can help a community prepare for new development. Economists are responsible for estimating the impacts of both specific transportation projects and for groups of projects during the planning and programming stages.

*Stages of Transportation Project:* #1 (Policy & Visioning), #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #6 (Operations & Maintenance)

*Work Samples:* Economic Benefits of the Trans-Hudson Passenger Rail Express Tunnel (<http://www.nj.gov/transportation/about/press/2006/051606.shtm>); Caltrans Economic Impact Analysis ([http://www.dot.ca.gov/hq/tpp/offices/eab/econ\\_impact\\_assess.html](http://www.dot.ca.gov/hq/tpp/offices/eab/econ_impact_assess.html))

## Practitioner Disciplines Involved in Transportation Decision Making

### ENVIRONMENTAL SCIENTIST



*Professional Training and Certification:* Environmental scientists may have advanced training in a variety of relevant fields, such as biology, ecology, soil science, hydrology, engineering, or other scientific fields. Some environmental scientists obtain optional certification as a Certified Environmental Professional (CEP) by demonstrating skills and experience in one of five environmental areas: assessment, documentation, operations, planning, research and education. CEP scientists are required to adhere to the Code of Ethics and Standards of Practice for Environmental Professionals (<http://www.abcep.org/>). Another type of optional certification is as a Professional Wetland Scientist (PWS), which also has a Code of Ethics (<http://www.wetlandcert.org/code.html>).

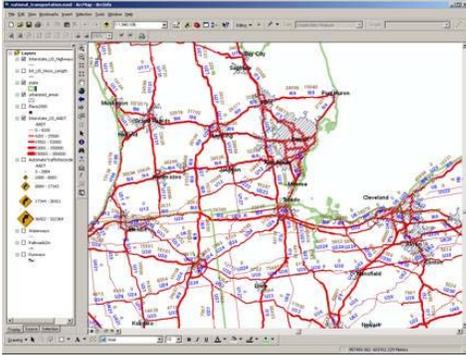
*Contribution to Understanding and Defining the Context of a Transportation Project:* Environmental scientists are critical in assessing, documenting and mitigating the environmental impacts of transportation projects to comply with state and national environmental laws and regulations. This work may involve diverse activities and several different environmental science specialties depending on the project, such as field visits to determine whether endangered species or wetlands are present at the proposed site, computer simulation and modeling to determine the impact of a proposed project on stormwater runoff in a critical water basin or impaired stream, and documentation to comply with laws and regulations (Environmental Impact Statement (EIS), Environmental Assessment (EA), or other). DOT environmental scientists often oversee NEPA compliance, and oversee the work of outside environmental consultants. Environmental scientists also participate in long-range planning and programming, helping to select and prioritize transportation projects that minimize potential environmental impacts. Several states have environmental staff specifically to support construction and maintenance.

*Stages of Transportation Project:* #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #5 (Construction), #6 (Operations & Maintenance).

*Work Samples:* Geneva Road (Utah) Environmental Impact Statement (<https://www.federalregister.gov/documents/2007/02/15/E7-2635/environmental-impact-statement-utah-county-ut>), Bruckner Sheridan Interchange (New York) Environmental Impact Statement (<https://www.dot.ny.gov/regional-offices/region11/projects/project-repository/scoping/scopingdocument.html>)

## Practitioner Disciplines Involved in Transportation Decision Making

### GEOGRAPHIC INFORMATION SYSTEM (GIS) SPECIALIST



*Professional Training and Certification:* GIS Specialists generally have completed a GIS certificate program or obtained a Bachelor of Science degree in Geography with an emphasis on GIS work. A GISP is a certified geographic information systems professional who has met the minimum standards for ethical conduct and professional practice as established by the GIS Certification Institute (<https://www.gisci.org/>).

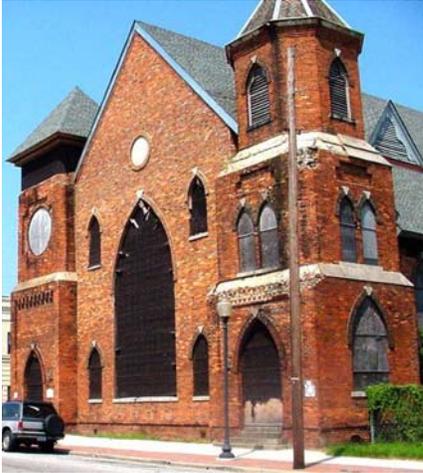
*Contribution to Understanding and Defining the Context of a Transportation Project:* GIS Specialists use GIS to integrate information from different sources, enabling better and more efficient transportation decision making. GIS Specialists can make maps that display data spatially and observe geographic patterns. They can also create maps that only show particular data items within databases, customizing visual displays for particular uses, such as showing traffic volumes or pavement conditions on a roadway. Another vital skill of a GIS Specialist is the ability to create visualizations of project alternatives effectively and efficiently in response to public or agency comments.

*Stages of Transportation Project:* #2 (Planning and Programming), #3 (Environmental Studies and Preliminary Design)

*Work Samples:* Geographic Information Systems Applications for Bicycle and Pedestrian Decision Making ([https://www.gis.fhwa.dot.gov/documents/GIS\\_BikePed\\_Peer\\_rpt.pdf](https://www.gis.fhwa.dot.gov/documents/GIS_BikePed_Peer_rpt.pdf)), Geographic Information Systems Applications for Transportation Right-Of-Way ([https://www.gis.fhwa.dot.gov/documents/rightOfWay.as\\_p#appa](https://www.gis.fhwa.dot.gov/documents/rightOfWay.as_p#appa))

## Practitioner Disciplines Involved in Transportation Decision Making

### HISTORIAN/ARCHITECTURAL HISTORIAN



*Professional Training and Certification:* Professional historians are likely to have a graduate degree in history, architecture, archaeology, or historic preservation. Federal regulations (36 CFR 61) define the minimum requirements for architectural historians conducting work on projects receiving federal funding:

[https://www.nps.gov/history/local-law/arch\\_stnds\\_9.htm](https://www.nps.gov/history/local-law/arch_stnds_9.htm)

*Contribution to Understanding and Defining the Context of a Transportation Project:* Historians may be called upon to provide information about locations and buildings of historical or cultural significance that may be impacted by a proposed project. Some State Historic Preservation Office (SHPO) guidelines require that a professional historian who meets state standards be involved in certain transportation projects. Review of a transportation project funded with federal money may also be required under Section 106 of the Historic Preservation Act of 1966 if the project meets certain criteria. By providing information and guidance during the preliminary design process, architectural historians can help engineers avoid or minimize impacts to these resources. For example, they may be called upon for assistance if a bridge with historical and cultural significance needs to be replaced because it cannot support the weight of large trucks or has other structural problems. Historians could assist engineers with designing a replacement bridge that meets modern structural requirements but that incorporates elements that are similar to the original (e.g., overall design, façade, lamp posts).

*Stages of Transportation Project:* #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #5 (Construction), #6 (Operations & Maintenance)

*Work Samples:* US 231 Relocation Study Section 106 Report (IN) ([http://www.in.gov/indot/div/projects/us231/spencer/pubs/PN\\_REVISED\\_062907\\_FINAL.pdf](http://www.in.gov/indot/div/projects/us231/spencer/pubs/PN_REVISED_062907_FINAL.pdf)); World Trade Center Section 106 Status Report ([http://www.panynj.gov/wtcprogress/pdf/sec\\_106\\_status\\_report\\_5.pdf](http://www.panynj.gov/wtcprogress/pdf/sec_106_status_report_5.pdf))

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## Practitioner Disciplines Involved in Transportation Decision Making

### LAND USE PLANNER



*Professional Training and Certification:* Typically, professional planners have a Masters degree in Urban Planning. Some land use planners also have advanced degrees in public health or geography. Certification through the American Institute of Certified Planners (AICP) is not required for planning professionals, but is common. Planners who are part of AICP are required to adhere to the AICP Code of Ethics and Professional Conduct (<https://www.planning.org/ethics/ethicscode.htm>).

*Contribution to Understanding and Defining the Context of a Transportation Project:* Land use planners work with transportation planners to ensure that local land use policies and zoning are complementary to transportation infrastructure. For example, if a new roadway is planned, it is essential to know the land uses it will serve (commercial businesses, industrial facilities, residential neighborhoods) in order for transportation planners to determine the number of lanes, turn lanes, traffic signals, etc. as well as plan for an appropriate level of heavy truck traffic. Land use planners are also involved in the environmental studies and preliminary project design to help identify the extent and type of development that can be expected as a result of a particular transportation project; and in the operations phase in determining with engineers appropriate solutions to alleviate traffic congestion problems (e.g., changes in configuration and number of driveways to access adjacent land uses, changes at traffic signals including pedestrian facilities). An increasing number of state DOTs have started to conduct corridor-level transportation and land use planning, and land use planners are central to the success of these efforts.

*Stages of Transportation Project:* #1 (Policy & Visioning), #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #6 (Operations & Maintenance)

*Work Samples:* Maine Gateway 1 Project (<http://www.waldoboromaine.org/docs/corridorManagementPlan.pdf>); City of St. Louis Strategic Land Use Plan (<https://www.stlouis-mo.gov/government/departments/planning/planning/adopted-plans/strategic-land-use/>)

## Practitioner Disciplines Involved in Transportation Decision Making

### LANDSCAPE ARCHITECT



*Professional Training and Certification:* Landscape architects typically have a Masters degree in Landscape Architecture. Landscape architects are regulated and licensed through licensure boards in 49 states, and the territory of Puerto Rico, under the umbrella of membership in the Council of Landscape Architectural Registration Boards (CLARB). CLARB and its members establish standards for education, experience and examinations for professional licensure of landscape architects to further ensure that landscape architectural services can be provided without endangering the health, safety and welfare of the public.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Landscape architecture is a broad design profession that integrates a working knowledge of art, architecture, civil engineering, environmental science, social science and physical planning to preserve, design, and manage practical, safe, healthy, aesthetic, and sustainable relationships between people, animals, plants, infrastructure, and development upon the land. Landscape architects assist engineers and planners in preliminary and final design of transportation projects by enhancing the design of a project to make it look and function better within the character of the existing community. This work can include elements of the transportation project itself (such as the aesthetics of the façade on a bridge or overpass, or changes in design to reduce stormwater runoff or decrease impervious surface) as well as coordinating elements such as streetscaping (trees, benches, sidewalk design) to improve the function and aesthetics of the project. They also assist in planning and design phases by visualizing the proposed project using hand and digital renderings to communicate with the public what the project will look like when complete. Landscape Architects work with construction and maintenance on designing revegetation or environmental restoration plans appropriate to the ecoregion and individual site.

*Stages of Transportation Project:* #3 (Environmental Studies and Preliminary Design), #4 (Final Design & Right-of-way), #6 (Operations & Maintenance).

*Work Samples:* Caltrans Landscape Architecture Program (<http://www.dot.ca.gov/design/lap/>); City of Seattle Landscape Architecture Program (<http://www.seattle.gov/Transportation/landscape.htm>)

## Practitioner Disciplines Involved in Transportation Decision Making

### MAINTENANCE ENGINEER



*Professional Training and Certification:* A maintenance engineer (or resident engineer) is a specialized type of civil engineer. Many states do not require a maintenance engineer to be licensed since they are following plans approved by a Professional Engineer (PE) and/or doing non-engineering work.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Maintenance Engineers and technicians live and work in the field and often have a good feel for the environments on the roads they maintain. Their understanding of context can help them lessen the negative impacts of maintenance activities on the community and/or identify positive improvements that can be made (e.g. fishing access improvements, more efficient or environmentally effective ways of conducting maintenance work and fixing identified problems). , Maintenance engineers and technicians exercise considerable autonomy in the field. Maintenance staff manage roads and roadsides through many years and many different types of conditions, from winter maintenance or flooding through vegetation and facility management and public use of the facility; therefore, they often have first hand experience with transportation assets in operation and failure. They have a sense of what works, what doesn't, and what can be done in many different contexts. Many DOT maintenance staffs have seen reductions by a third or more in the last decade, though work has increased. As a result, many maintenance departments have put little time into thinking about how to communicate with the public about the environmental management they are or could be doing, or how to do so in a way that is meaningful to citizens.

*Stages of Transportation Project:* #6 (Operations & Maintenance)

Note: Maintenance engineers should be consulted during planning, programming, design and operations.

*Work Samples:* King County (WA) Road Services Division  
<http://www.kingcounty.gov/depts/transportation/Roads.aspx>;  
CalTrans Structure Maintenance and Investigation  
<http://www.dot.ca.gov/hq/structur/strmaint/>

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## Practitioner Disciplines Involved in Transportation Decision Making

### MARKETING PROFESSIONAL



*Professional Training and Certification:* Marketing professionals typically have a Bachelors degree in marketing, and/or a Masters of Business Administration.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Marketing professionals assist with public involvement by designing user-friendly documents and websites to more effectively communicate information about transportation planning and projects with the public. A document or website that has been carefully thought-out and is rich with graphics, photos and examples, is more likely to be read by the general public than one that is text-only. Since the first step in getting the public to be involved in the planning and design of projects is getting them to read the information provided by practitioners, marketing professionals are critical to the process.

*Stages of Transportation Project:* #1 (Policy & Visioning), #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #5 (Construction), #6 (Operations & Maintenance)

*Work Samples:* The Maryland State Highway Administration's Intercounty Connector website demonstrates elements of good marketing by having a user-friendly interface, interactive maps, project photos and video updates, document downloads, and frequently asked questions (<http://www.mdt.maryland.gov/ICC/ICC.html>).

## Practitioner Disciplines Involved in Transportation Decision Making

### PROJECT MANAGER



*Professional Training and Certification:* Project managers are typically engineers, but can also be planners or landscape architects. Each would have the training and licensure appropriate for his or her particular profession. Depending on the state, project managers may be required to have additional training in effective project management.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Traditionally, a project progresses through the life stages by being passed from one department at the state DOT to another, with limited connection between staff working in different departments. In response to this, some state DOTs have project managers who, ideally, shepherd each specific project from beginning to end, with the ultimate goal of getting the project delivered on time and within budget. Project managers may specialize in different areas of project delivery, including engineering, planning, environmental specialist, public involvement or landscape architecture. Ideally, they work collaboratively with staff from all departments within the DOT to facilitate progress on their project. Depending on the state, they may be involved in the project for a few phases (scoping through design, for example), or they may be involved in the overseeing projects from planning through to construction, including ensuring that environmental commitments are kept. Their understanding of the context of a project is therefore critical to the ultimate finished product. Operations and maintenance work is generally managed by separate individuals.

*Stages of Transportation Project:* #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #4 (Final Design & Right-of-Way), #5 (Construction), #6 (Operations & Maintenance)

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## Practitioner Disciplines Involved in Transportation Decision Making

### PUBLIC HEALTH PROFESSIONAL



*Professional Training and Certification:* Most public health professionals have a Masters degree in public health, with a Bachelors degree in one of the physical or social sciences. Some public health professionals also have a Masters degree in Urban Planning.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Where we live impacts our health in many ways; there is particular concern about how a community's transportation facilities and land use decisions contribute to dependence on automobiles, which in turn impacts health by discouraging physical activity, contributing to air pollution, and increasing motor vehicle accidents. Public health professionals can assist in policy and planning by analyzing how specific policies or plans may have positive or negative impacts on public health. They may also assist in the preliminary design for specific projects by analyzing how the design of a project could be improved for public health benefits (such as including safe and attractive bicycle and pedestrian facilities, modifying design to improve connectivity between key origins and destinations to reduce vehicle miles traveled and thus improve air quality).

*Stages of Transportation Project:* #1 (Policy & Visioning), #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #5 (Construction), #6 (Operations & Maintenance)

*Work Samples:* "Urban Sprawl and Public Health" article from the Centers for Disease Control  
(<https://www.cdc.gov/healthyplaces/articles/Urban%20Sprawl%20and%20Public%20Health%20-%20PHR.pdf>)

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## Practitioner Disciplines Involved in Transportation Decision Making

### PUBLIC INVOLVEMENT SPECIALIST



*Professional Training and Certification:* There is no formal university education degree for public involvement. Specialists typically have a background in urban planning, communications, public relations, or social science. Additional training can be obtained through targeted public involvement courses offered by the National Highway Institute, National Transit Institute, some state DOTs and third-party consultants. Professional training in facilitation is often very important (see the Institute of Cultural Affairs <http://www.ica-usa.org/> and International Association for Public Participation <http://www.iap2.org/>)

*Contribution to Understanding and Defining the Context of a Transportation Project:* Input from the public is critical to the overall quality of a transportation project because the people who would be affected by the project(s) have the best understanding of what their needs are and how the project(s) can enhance their quality of life. Public involvement specialists are skilled in finding ways to engage the public in the transportation policy, planning, programming, and preliminary design phases. Depending on the phase and the community, the specialist may arrange public meetings to share information, interactive workshops designed to get the public involved in the process, public surveys (online and paper) to get feedback from those unable to attend meetings, websites and discussion forums, and translation services for those with limited English proficiency. In addition, these specialists make themselves available by phone or email to take public comments and to ensure that questions are answered by the appropriate people within the agency. Depending on the requirements of the state, public involvement specialists may be required to prepare a Public Involvement Plan for each proposed transportation project.

*Stages of Transportation Project:* #1 (Policy & Visioning), #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #5 (Construction), #6 (Operations & Maintenance)

*Work Samples:* Pelham (NH) Route 111A Intersections Project Public Involvement Plan (<https://www.nh.gov/dot/projects/pelham14491/index.htm>); Brevard County (FL) Public Involvement (<https://www.planning.dot.gov/documents/CaseStudy/Brevard/BrevardCase.htm>)

## Practitioner Disciplines Involved in Transportation Decision Making

### REAL ESTATE APPRAISER



*Professional Training and Certification:* Federal law mandates that most appraisers hold state certification and licensure, which vary by state, but there are certain minimum standards. Most appraisers of residential real property must have at least an Associate's degree, while appraisers of commercial real property are required to have at least a Bachelor's degree. Most states also have the Licensed Residential Real Property Appraiser classification, which grants holders permission to appraise certain types of real estate. In many states, those working on their appraiser requirements for licensure or certification are classified as a "trainee." Trainee programs vary by state but usually require at least 75 hours of specified appraisal education before one can apply for a trainee position. Across all levels of certification and licensure, trainees must take 15 hours of classroom education devoted to the Uniform Standards of Professional Appraisal Practice and pass an examination. Continuing education is necessary to maintain a license or certification.

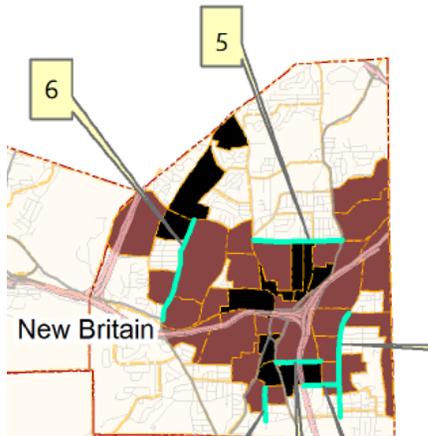
*Contribution to Understanding and Defining the Context of a Transportation Project:* Real estate appraisers estimate the value of real property whenever it is sold, mortgaged, taxed, insured, or developed. They work in localities they are familiar with, so they have knowledge of any environmental or other concerns that may affect the value of a property. DOTs use real estate appraisers to help determine the value of properties and/or easements that must be acquired for transportation projects.

*Stages of Transportation Project: #4 (Final Design & Right-of-way)*

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## Practitioner Disciplines Involved in Transportation Decision Making

### SOCIAL SCIENTIST



*Professional Training and Certification:* Social scientists may have a Bachelors or Masters degree in a variety of fields, including anthropology, sociology, psychology, communication, history, public relations, or political science.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Social scientists may contribute to transportation projects in a variety of ways, since transportation projects at their core are about people and their quality of life. Social scientists may be involved in the policy and planning stages to estimate the social impacts of specific policies and projects, or the preliminary design phase to assist in understanding how to best fit a project within a specific community.

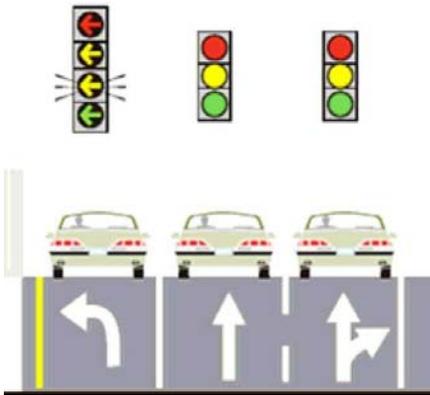
*Stages of Transportation Project:* #1 (Policy & Visioning), #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #6 (Operations & Maintenance)

*Work Samples:* Social Impact Report for projects funded in 2009 with the Central Connecticut Region's share of the American Recovery & Reinvestment Act Highway Infrastructure Investment funds

[http://www.ccrpa.org/transportation/Social%20Impact%20Report%20for%20ARRA%20Projects%20\(2009\).pdf](http://www.ccrpa.org/transportation/Social%20Impact%20Report%20for%20ARRA%20Projects%20(2009).pdf)

## Practitioner Disciplines Involved in Transportation Decision Making

### TRAFFIC OPERATIONS ENGINEER



*Professional Training and Certification:* Traffic operations engineers are a specialized type of civil engineer. As such, they must go through the same training and licensure described above for transportation engineers. In addition to being licensed as a Professional Engineer, they may become certified as a Professional Traffic Operations Engineer (PTOE) (<http://www.tpcb.org/ptoe/>).

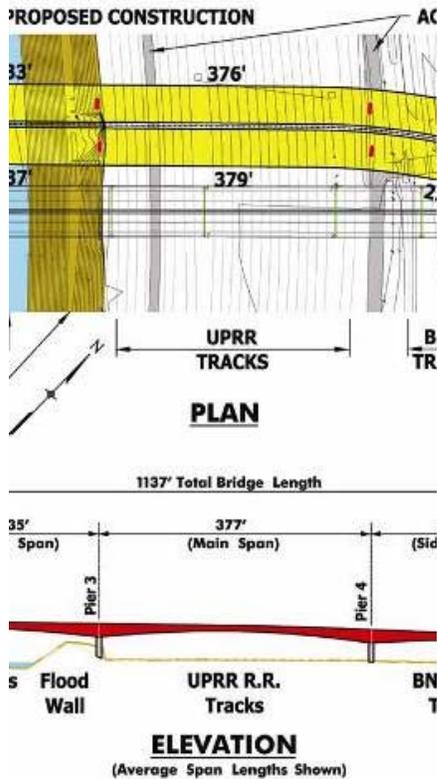
*Contribution to Understanding and Defining the Context of a Transportation Project:* Traffic operations engineers focus on how existing transportation facilities function, typically on the when, where and how of traffic signals, stop signs, yield, and speed limits. Their understanding of a transportation facility in context can lead directly to improvements that positively affect the quality of life of the transportation users. An example includes traffic congestion at a particular intersection where many cars are making right turns. Examining the context indicates that many pedestrians are walking to and from local businesses impeding the turning movements during vehicle cycles. The traffic engineer decides to solve the problem adding a pedestrian-only cycle in the traffic signal to prevent the conflict between pedestrians and vehicles; thereby, improving traffic flow and safety for pedestrians by reducing potential conflicts with vehicles. Transportation management centers operated by DOTs and other partners (often local governments and state and local police and emergency services) help ensure that the transportation operates optimally under regular demand and emergencies, for large community events, and in inclement weather.

*Stages of Transportation Project:* #2 (Planning & Programming), #4 (Final Design & Right-of-way), #6 (Operations & Maintenance)

*Work Samples:* City of Denver (CO) Traffic Engineering (<https://www.denvergov.org/content/denvergov/en/denver-development-services/help-me-find-transportation-engineering.html>); Broward County (FL) Traffic Operations Division (<http://www.broward.org/Traffic/Pages/Default.aspx>)

## Practitioner Disciplines Involved in Transportation Decision Making

### TRANSPORTATION ENGINEER (DESIGN ENGINEER)



*Professional Training and Certification:* Transportation engineers usually have a Bachelors degree in civil engineering and take an internship during or following undergraduate study with a practicing civil engineer. Sometimes staff from other backgrounds can be trained in the field. Within civil engineering, there are specialties for transportation, structural, construction, geotechnical and water resources. States vary somewhat in licensure requirements, but all require that engineering work be signed prior to construction by a state-authorized engineer with a Professional Engineer (PE) license. Prior to taking the PE exam, engineers spend several years building work experience under licensed engineers. Professional Engineers must adhere to the Code of Ethics for licensed engineers in their state. Not all engineers working in a state DOT or consulting firm are required to have a PE license. All engineers are bound by the Code of Ethics of the National Society of Professional Engineers (<https://www.nspe.org/resources/ethics/code-ethics>) and the American Society of Civil Engineers (<http://www.asce.org/code-of-ethics/>), as applicable.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Engineers play an instrumental role throughout the life a transportation project since they have significant input in determining what the project looks like on the ground. Their role is to synthesize information from many other professionals (such as planners, environmental scientists and others) and the community with established engineering principles to design a project that will function to serve the intended purpose in a safe manner. They need to understand where there is flexibility in engineering standards in order to find a solution that best fits the context as well as the transportation need.

*Stages of Transportation Project:* #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #4 (Final Design & Right-of-way), #5 (Construction), #6 (Operations & Maintenance)

*Work Samples:* Intercounty Connector (DC Suburbs, Maryland) <https://www.wagman.com/projects/heavy-civil/icca.asp>; 4<sup>th</sup> Street Bridge (Pueblo, Colorado) <https://www.codot.gov/projects/4thstreetbridge/bridge-design.html>

## Practitioner Disciplines Involved in Transportation Decision Making

### TRANSPORTATION PLANNER



*Professional Training and Certification:* Typically, professional planners have a Masters degree in Urban Planning. Certification through the American Institute of Certified Planners (AICP) is not required, but is common, for planning professionals. Planners who are part of AICP are required to adhere to the AICP Code of Ethics and Professional Conduct (<https://www.planning.org/ethics/ethicscode.htm>). Some transportation planners also have a degree in civil engineering and may be certified as a Professional Engineer (PE).

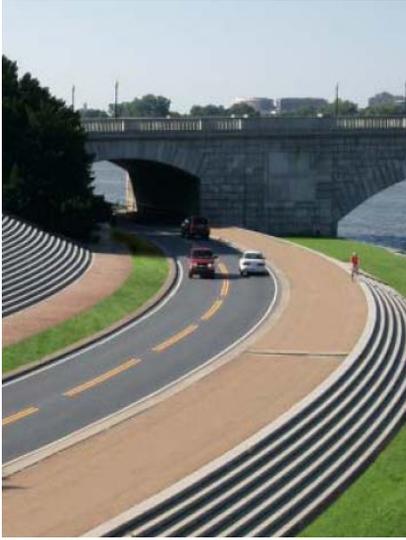
*Contribution to Understanding and Defining the Context of a Transportation Project:* Transportation planners forecast future transportation needs using current demographic and traffic data, then develop and prioritize a list of transportation improvements to address shortfalls in capacity, safety and mobility improvements. Planning includes all modes of transportation: roadway, transit, and bicycle/pedestrian. This type of work is conducted at many scales: local (town, city, county), regional, and state. Due to the interconnected nature of transportation systems, plans must consider and work with the plans of neighboring jurisdictions as well as overlapping ones (e.g., state-owned roads within city limits). Federal requirements under SAFETEA-LU also require coordination with resource agencies to consider existing resource plans and priorities and anticipate mitigation needs and opportunities.

*Stages of Transportation Project:* #1 (Policy & Visioning), #2 (Planning & Programming), #6 (Operations & Maintenance)

*Work Samples:* Washington State Transportation Plan (<https://washtransplan.com>), City of Ann Arbor Transportation Plan (<http://www.a2gov.org/departments/systems-planning/planning-areas/transportation/Pages/default.aspx>)

## Practitioner Disciplines Involved in Transportation Decision Making

### URBAN DESIGNER/ARCHITECT



*Professional Training and Certification:* Architects hold a Bachelors or Masters degree in architecture, depending on the university attended. Each state requires the licensure of professional architects, though the prerequisite experience and requirements may vary by state. Licensed architects are held to the American Institute of Architects' Code of Ethics and Professional Conduct (<https://www.aia.org/pages/3296-aia-code-of-ethics-and-professional-conduct>). Not all urban designers are architects, however; landscape architects and planners can also specialize in urban design.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Urban designers or architects have a similar background as landscape architects (described above), but focus on specific buildings and spaces rather than the larger landscape. They may be involved in helping provide understanding of the context of a transportation project when it is located in an urban area, to ensure that the design of the project is complementary to nearby buildings and structures.

*Stages of Transportation Project:* #1 (Policy & Visioning), #2 (Planning & Programming), #3 (Environmental Studies and Preliminary Design), #6 (Operations & Maintenance)

*Work Samples:* Anacostia Waterfront Initiative (DC) Transportation Architecture Design Guidelines ([https://comp.ddot.dc.gov/SitePages/Anacostia Waterfront Initiative \(AWI\).aspx](https://comp.ddot.dc.gov/SitePages/Anacostia%20Waterfront%20Initiative%20(AWI).aspx))

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## Practitioner Disciplines Involved in Transportation Decision Making

### URBAN FORESTER



*Professional Training and Certification:* Urban foresters may have advanced training in Urban Forestry, Forestry, Horticulture, Arboriculture, Natural Resource Management, Landscape Architecture, Environmental Sciences, Environmental Studies, or Urban Planning. Certification through the International Society of Arboriculture (ISA) is optional and those who are certified must comply with the ISA Certified Arborist Code of Ethics (<http://www.isa-arbor.com/certification/codeofethics/index.aspx>). Some states, such as California, have their own certification programs and requirements.

*Contribution to Understanding and Defining the Context of a Transportation Project:* Urban foresters assist environmental scientists, planners and engineers by preserving existing trees and finding appropriate locations for new ones when designing, constructing and maintaining transportation projects. They may be particularly helpful to involve on a project that will affect particularly large, old, or culturally significant trees to ensure that they are not harmed during construction or maintenance.

*Stages of Transportation Project:* #3 (Environmental Studies and Preliminary Design), #5 (Construction), #6 (Operations & Maintenance)

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## **Appendix B**

### **Context Tools**

The table on the following pages lists tools to help define and understanding context. These tools are divided into three categories: project-based tools (primarily used in stages 3-6), community-based tools (primarily used in stages 1 and 2), and toolkits and resource sets.

Name of Tool	Web Site Link	Description
<b>1. Project-Based Tools for the Environmental Studies, Construction, Operations and Maintenance Phases</b>		
Community Context Audit (PennDOT)	<a href="https://www.fhwa.dot.gov/planning/css/key_references/practitionersguide/reference/pennDOT_context_audit.pdf">https://www.fhwa.dot.gov/planning/css/key_references/practitionersguide/reference/pennDOT_context_audit.pdf</a>	The audit form is intended to be a guide for practitioners to identify various community characteristics that make each transportation project location unique to its residents, its businesses and the public in general. Findings from the audit will help to define the purpose and need of the proposed transportation improvements based upon community goals and local plans for future development.
Community Effects Considerations (Adapted from Florida DOT)	<a href="https://www.fhwa.dot.gov/planning/css/key_references/practitionersguide/reference/fdot_community_effects.pdf">https://www.fhwa.dot.gov/planning/css/key_references/practitionersguide/reference/fdot_community_effects.pdf</a>	The audit form asks the practitioner to answer a series of questions to ensure that all angles of potential community impacts from the project have been addressed. The tool presents a series of questions under seven headings. For each question, suggested data sources and key analyses are listed to assist the practitioner in answering the question. Suggested data sources and analysis are very detailed, providing ideas and instructions for practitioners.
Smart Growth Tools/ PlaceMatters	<a href="https://www.epa.gov/smartgrowth/smart-growth-tools">https://www.epa.gov/smartgrowth/smart-growth-tools</a>	This is a dynamic database website that is a resource for communities to identify tools and processes for better community design and decision making. Several of the tools listed in this database come from an EPA report on Projected Land-Use Change. A Planning Process Map shows what tools support different stages of a typical decision making process (comprehensive planning focused) or view the database directly using the browse, list all, and search features. Tool providers are invited to add new tools to the database and can edit them at any time. Users are encouraged to provide feedback on their experiences using the tools.
Blue and Green Highways Maintenance Corridor Evaluation Form	<a href="https://www.dot.ny.gov/divisions/operating/oom/transportation-maintenance/green-blue-highways">https://www.dot.ny.gov/divisions/operating/oom/transportation-maintenance/green-blue-highways</a>	Maintenance region/residency selects a highway segment, based on environmental and cultural features and/or operational needs. Maintenance region/residency staff then use the tool/form to systematically evaluate environmental enhancements that the DOT might be able to effect in the corridor.
State Wildlife Action Plans	<a href="https://wsfrprograms.fws.gov/Subpages/GrantPrograms/SWG/SWG.htm">https://wsfrprograms.fws.gov/Subpages/GrantPrograms/SWG/SWG.htm</a>	In order to receive funds through the Wildlife Conservation and Restoration Program and the State Wildlife Grants Program, Congress charged each state and territory with developing a wildlife action plan. These plans, known technically as “comprehensive wildlife conservation strategies,” assess the health of each state’s wildlife and habitats, identify the problems they face, and outline the actions that are needed to conserve them over the long term. State wildlife action plans are the essential base plan to consult for natural resource considerations in each state. Additional local, Non-Governmental Organization plans can be consulted as well.

Name of Tool	Web Site Link	Description
Ecosystem Based Tools Network	<a href="http://www.ebmtools.org/">http://www.ebmtools.org/</a>	Ecosystem-Based Management (EBM) is an innovative management approach. It considers the whole ecosystem, including humans and the environment, rather than managing one issue or resource in isolation. EBM tools are software or other highly documented methods that can help implement EBM by: providing models of ecosystems or key ecosystem processes, generating scenarios illustrating the consequences of different management decisions on natural resources and the economy, and facilitating stakeholder involvement in planning processes.
Thinking Beyond the Pavement Checklist (Maryland SHA)	<a href="http://itre.ncsu.edu/CTE/Education/CSS-2006/Ses18ResourceCSSChecklist.pdf">http://itre.ncsu.edu/CTE/Education/CSS-2006/Ses18ResourceCSSChecklist.pdf</a>	The checklist is a tool to be used by practitioners to assess the physical setting - both natural and man made - in which proposed improvements would occur. The checklist can be used as part of the Context Sensitive Solutions (CSS) approach.
Maintenance Customer Service Surveys	<a href="http://www.dot.ca.gov/hq/maintenance/external_survey/2005_survey/index.htm">http://www.dot.ca.gov/hq/maintenance/external_survey/2005_survey/index.htm</a>	Caltrans and many other DOTs consult with the public to identify priorities within the constraints of the organization and available resources, and to develop a culture of continuous improvement and innovation. Every year, aging infrastructure requires increased maintenance. At the same time, work windows for maintenance crews decrease, more stringent environmental requirements are developed, and congestion increases, placing additional demands on the highway maintenance budget. To be more efficient and innovative, maintenance continuously monitors and evaluates its performance through the Levels of Service (LOS) Bridge and Pavement management systems, and customer survey results.
Roadway Audit Tool, Analytic and Checklist Versions (St. Louis University School of Public Health)	<a href="http://www.activelivingresearch.org/files/audit_tool_analytic.pdf">http://www.activelivingresearch.org/files/audit_tool_analytic.pdf</a> <a href="http://www.activelivingresearch.org/files/audit_tool_checklist.pdf">http://www.activelivingresearch.org/files/audit_tool_checklist.pdf</a>	The audit forms were designed to better understand the relationship between street-scale environments and rates of physical activity.
<b>2. Community-Based Tools for Policy, Planning and Programming Phases</b>		
Walkability Checklist and A Resident's Guide for Creating Safe and Walkable Communities (Partnership for a Walkable America and the Federal Highway Administration)	<a href="http://www.pedbikeinfo.org/cms/downloads/walkability_checklist.pdf">http://www.pedbikeinfo.org/cms/downloads/walkability_checklist.pdf</a> <a href="https://safety.fhwa.dot.gov/ped_bike/ped_community/ped_walkguide/residents_guide2014_final.pdf">https://safety.fhwa.dot.gov/ped_bike/ped_community/ped_walkguide/residents_guide2014_final.pdf</a>	This one-page checklist is designed for community members to determine if their neighborhood is a friendly place to walk. The guidebook can be referenced by participants to learn about roadway conditions, traffic problems that adversely affect pedestrian movements, and ways to help address these problems to make the environment more supportive of pedestrian activity.

Name of Tool	Web Site Link	Description
MetroQuest	<a href="http://www.metroquest.com">http://www.metroquest.com</a>	MetroQuest helps communicate complex planning concepts easily to a wide range of people, generates public awareness of tradeoffs among priorities and preferences, helps develop an understanding of policy decisions and consequences, and helps create broad-based consensus for your community's future vision.
Active Community Environments (ACEs) Community Assessment (Eat Smart, Move More NC)	<a href="http://www.eatsmartmove.morenc.com/Community.html">http://www.eatsmartmove.morenc.com/Community.html</a>	This is an assessment tool designed to help the user identify ways that can help encourage and support bicycle movements. There are five short questionnaires and a rating system that can be used as a benchmark for community progress.
Active Neighborhood Checklist (St. Louis University School of Public Health)	<a href="http://activelivingresearch.org/active-neighborhood-checklist">http://activelivingresearch.org/active-neighborhood-checklist</a>	The checklist is designed to assess street-level features of a neighborhood thought to be related to physical activity. It can be used to produce descriptive statistics about an area, to raise awareness about the environment in supporting or discouraging pedestrian activity, and/or mobilize the community to advocate for enhancements or improvements.
Making Your Community Walkable and Bikeable: A Guidebook for Change (UNC School of Public Health)	<a href="http://www.unc.edu/~jemery/WABSA/documents/wabsa%20guidebook%2003-1029.pdf">http://www.unc.edu/~jemery/WABSA/documents/wabsa%20guidebook%2003-1029.pdf</a>	The guidebook is a step-by-step navigation tool for local groups and citizens to enhance the local road network to be more supportive of pedestrian movements.
Irvine Minnesota Inventory (Kristen Day, Ph.D., Marlon Boarnet, Ph.D., Mariela Alfonzo, MURP, and Ann Forsyth, Ph.D.)	<a href="https://webfiles.uci.edu/kday/public/Irvine_MN_Inventory.pdf">https://webfiles.uci.edu/kday/public/Irvine_MN_Inventory.pdf</a> <a href="https://webfiles.uci.edu/kday/public/index.html">https://webfiles.uci.edu/kday/public/index.html</a>	The audit tool is designed largely for practitioners and public health officials to collect data on features of the physical environment that are potentially linked to physical activity.
Systematic Pedestrian and Cycling Environmental Scan (SPACES) Audit Instrument (The University of Western Australia)	<a href="http://activelivingresearch.org/sites/default/files/SPACES_Audit_Instrument_0.pdf">http://activelivingresearch.org/sites/default/files/SPACES_Audit_Instrument_0.pdf</a> <a href="http://activelivingresearch.org/sites/default/files/SPACES_Observation_Manual.pdf">http://activelivingresearch.org/sites/default/files/SPACES_Observation_Manual.pdf</a>	This observational tool helps practitioners assess the physical environment in a neighborhood and its suitability to support pedestrian movements.

Name of Tool	Web Site Link	Description
Measuring Urban Design Qualities: An Illustrated Field Manual (Active Living Research Program, Robert Wood Johnson Foundation)	<a href="http://smartgrowth.umd.edu/assets/documents/research/ewingclementehandyetal_field_manual_2005.pdf">http://smartgrowth.umd.edu/assets/documents/research/ewingclementehandyetal_field_manual_2005.pdf</a> <a href="http://smartgrowth.umd.edu/measuringurbandesignqualities.html">http://smartgrowth.umd.edu/measuringurbandesignqualities.html</a>	This manual provides an introduction to several key urban design qualities and guidance on how to objectively measure qualities of a typical street. Includes a scoring sheet for measuring urban design qualities.
Walking Suitability Assessment Form (James Emery, Eat Smart, Move More NC)	<a href="http://www.unc.edu/~jemery/WABSA/documents/walking_method_revised%20021003.pdf">http://www.unc.edu/~jemery/WABSA/documents/walking_method_revised%20021003.pdf</a>	The assessment form is a short one-page tool that can be used by area residents to evaluate a road segment under 2 miles in length and its ability to support pedestrian movements. A detailed discussion of how to use this resource is found in the appendices of Making Your Community Walkable and Bikeable: A Guidebook for Change. <a href="http://www.eatsmartmovemorenc.com/ACEs/Texts/070317_wabsa_guidebook.pdf">http://www.eatsmartmovemorenc.com/ACEs/Texts/070317_wabsa_guidebook.pdf</a>
Bicycle Suitability Assessment Form (James Emery, Eat Smart, Move More NC)	<a href="http://www.unc.edu/~jemery/WABSA/documents/bike_method_revised%20101502.pdf">http://www.unc.edu/~jemery/WABSA/documents/bike_method_revised%20101502.pdf</a>	This one-page audit form is to be used by area residents to assess the condition of a corridor and its suitability to support bicycle movements. The audit form is divided into three short sections: general road factors; pavement factors; and location factors. A detailed discussion of how to use this resource is found in the appendices of Making Your Community Walkable and Bikeable: A Guidebook for Change. <a href="http://www.eatsmartmovemorenc.com/ACEs/Texts/070317_wabsa_guidebook.pdf">http://www.eatsmartmovemorenc.com/ACEs/Texts/070317_wabsa_guidebook.pdf</a>
West Peterborough Road Audit (NHDOT, Peterborough Transportation Management)	<a href="http://www.swrpc.org/files/data/trans/Peterborough%20RSA-083109_0.pdf">http://www.swrpc.org/files/data/trans/Peterborough%20RSA-083109_0.pdf</a>	This audit tool evaluates how well streets and adjacent land uses are performing as places, and identify opportunities for future enhancements.
Place Game - Planning through Transportation (Project for Public Spaces)	<a href="http://placemakingchicago.com/cmsfiles/placemaking_PlaceGame.pdf">http://placemakingchicago.com/cmsfiles/placemaking_PlaceGame.pdf</a>	Project for Public Spaces (www.pps.org) designed The Place Game to evaluate how well streets and adjacent land uses are performing as places, and to identify opportunities to enhance them in the future.

Name of Tool	Web Site Link	Description
Social Capital Community Benchmark Survey (Saguaro Seminar: Civic Engagement in America Project, John F. Kennedy School of Government at Harvard University)	<a href="https://www.hks.harvard.edu/saguaro/pdfs/socialcapitalshortform.pdf">https://www.hks.harvard.edu/saguaro/pdfs/socialcapitalshortform.pdf</a>  <a href="https://www.hks.harvard.edu/saguaro/communitysurvey/docs/survey_instrument.pdf">https://www.hks.harvard.edu/saguaro/communitysurvey/docs/survey_instrument.pdf</a>	The survey was designed to be used by state or federal government agencies interested in surveying constituents on social capital; smaller communities that may not have the time, budget, or staff to use the long-form survey; and communities and non-profits that may already be conducting surveys and want the short-form to act as supplemental information on social capital. The survey is designed to be used "pre" and "post" project to determine if social capital has changed.
Smart Growth Checklist, A Checklist for Municipal Land Use Planning and Management (NYSDOT)	<a href="https://www.dot.ny.gov/programs/smart-planning/repository/SGCheckMunicipal_PRINT.pdf">https://www.dot.ny.gov/programs/smart-planning/repository/SGCheckMunicipal_PRINT.pdf</a>	This easy-to-use tool can be used by communities when making decisions about future land use and development patterns. It is designed to assess how well planning and land use decisions in a community follow the principles of Smart Growth.
Smart Growth Checklist, A Checklist for Proposed Development in Your Community (NYSDOT)	<a href="https://www.dot.ny.gov/programs/smart-planning/repository/SGCheckDevelopment_Print.pdf">https://www.dot.ny.gov/programs/smart-planning/repository/SGCheckDevelopment_Print.pdf</a>	Communities can use this checklist to determine how a proposed project would contribute to the overall well-being of a community.
Assessing Your Community's Aging-Readiness: A checklist of key features of an aging-friendly community (Partners for Livable Communities and the National Association of Area Agencies on Aging)	<a href="http://www.who.int/ageing/publications/Age_friendly_cities_checklist.pdf">http://www.who.int/ageing/publications/Age_friendly_cities_checklist.pdf</a>	The checklist is part of a guidebook to arm local leaders with the knowledge and tools necessary to build collaborative partnerships for creating livable communities for people of all ages.
<b>3. Toolkits and Resource Sets</b>		
PolicyMap, Geographic Information Systems Mapping Services and Software (The Reinvestment Fund)	<a href="https://www.policymap.com">https://www.policymap.com</a>	This online tool has the capacity to map and report information on up to 4,000 indicators related to demographics, real estate, crime rates, health, schools, housing affordability, employment, energy, and public investments.

Name of Tool	Web Site Link	Description
SHRP On-Line Tools: Transportation for Communities	<a href="https://www.fhwa.dot.gov/goshrp2/Resources/Toolkit">https://www.fhwa.dot.gov/goshrp2/Resources/Toolkit</a>	This online resource contains a central database of information on the transportation decision-making process (including key players, decision points, connections between processes, a process diagnostic tool, and an extensive library of case studies). Links to several other resources developed through the SHRP program, including resources on economic development, transportation visioning, greenhouse gases, and performance measurement.
The Conservation Registry	<a href="http://www.conservationregistry.org/">http://www.conservationregistry.org/</a>	The Conservation Registry is an online, centralized database that records, tracks and maps on-the-ground conservation projects. The purpose of the Registry is to help users understand the context, distribution, and effectiveness of collective efforts to protect and restore ecosystems.
Economic Development and Redevelopment: A toolkit for building healthy, vibrant communities (Lisa M. Feldstein, Rick Jacobus, and Hannah Burton Laurison)	<a href="http://community-wealth.org/content/economic-development-and-redevelopment-toolkit-building-healthy-vibrant-communities">http://community-wealth.org/content/economic-development-and-redevelopment-toolkit-building-healthy-vibrant-communities</a>	The toolkit is designed to inform nutrition and public health advocates on ways to improve food access in low-income neighborhoods. It is also a good reference for transportation and economic development practitioners working to rebuild communities. It provides an overview of techniques and tools that can be used for effectively engaging communities in land use and redevelopment activities.
A Community Approach to Address Health Disparities: T*H*R*I*V*E Toolkit for Health & Resilience in Vulnerable Environments (The Prevention Institute)	<a href="https://minorityhealth.hhs.gov/assets/pdf/checked/THRIVE_FinalProjectReport_093004.pdf">https://minorityhealth.hhs.gov/assets/pdf/checked/THRIVE_FinalProjectReport_093004.pdf</a>	The toolkit was developed as a community resilience assessment tool to help communities enhance their environment in ways that improve public health and reduce disparities experienced by racial and ethnic minorities.
Public Health Workbook to Define, Locate and Reach Special, Vulnerable and At-Risk Populations in an Emergency (Center for Disease Control and Prevention)	<a href="https://emergency.cdc.gov/workbook/index.asp">https://emergency.cdc.gov/workbook/index.asp</a>	The workbook outlines a systematic process that can support municipal, state, and tribal planners and public health officials as they design and implement new strategies to reach all populations - including traditionally underserved and hard to reach populations - in day-to-day communication and during crisis or emergency situations.

Name of Tool	Web Site Link	Description
Community Tool Box (Work Group for Community Health and Development, University of Kansas)	<a href="http://ctb.ku.edu/en/table-of-contents">http://ctb.ku.edu/en/table-of-contents</a> <a href="http://ctb.ku.edu/en/table-of-contents/analyze/analyze-community-problems-and-solutions">http://ctb.ku.edu/en/table-of-contents/analyze/analyze-community-problems-and-solutions</a>	The Community Tool Box provides practical, step-by-step guidance in community building skills that can be used in a variety of settings to understand community characteristics and create exercises that increase community cohesion. Section 17 is of particular interest to facilitate in the visioning process.
What's Behind Resident Quality of Life Perceptions (International City/County Management Association)	<a href="https://icma.org/node/21613">https://icma.org/node/21613</a>	This is an online resource that hosts a wealth of information about quality of life considerations, performance measures, and survey instruments. It identifies current initiatives and has a subscription survey service that could be used by a transportation agency or government agencies looking to better understand the environment in which they are working.

## **Appendix C**

### **Partial List of Research Studies Funded by the Transportation Research Board and Federal Highway Administration**

The table on the next page provides a partial list of research studies on Context Sensitive Solutions that have been funded by either the Transportation Research Board or the Federal Highway Administration. These studies provide a wealth of information and are a valuable resource for more detailed information on CSS.

Partial List of CSS Research Studies funded by the Transportation Research Board & FHWA		
NCHRP 15-32	Context Sensitive Solutions: Quantification of the Benefits in Transportation	<a href="http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=412">http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=412</a>
NCHRP Synthesis 20-05	Multi-disciplinary Teams in Context Sensitive Solutions	<a href="http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=94">http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=94</a>
NCHRP 08-68	Citizen's Guide and Discipline-specific Professional's Guide for Context Sensitive Solutions in Transportation	<a href="http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1618">http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1618</a>
NCHRP 20-24	Research Program Design – Administration of Highway and Transportation Agencies. Performance Measurement in Context Sensitive Design	<a href="http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=560">http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=560</a>
NCHRP 15-19	Application of Context Sensitive Design Principles	<a href="http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=399">http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=399</a>
FHWA- HEP-07- 014	Integration of Context Sensitive Solutions in the Transportation Planning Process – Final Report	<a href="https://www.fhwa.dot.gov/planning/css/key_references/integrating/index.cfm">https://www.fhwa.dot.gov/planning/css/key_references/integrating/index.cfm</a>
FHWA	Linking the Transportation Planning and NEPA Process	<a href="https://www.environment.fhwa.dot.gov/strmlng/pdfs/Planning_NEPAGuidance.pdf">https://www.environment.fhwa.dot.gov/strmlng/pdfs/Planning_NEPAGuidance.pdf</a>
FHWA	A Guide to Building CSS Knowledge and Skills for Successful Project Delivery	<a href="http://www.fhwa.dot.gov/context/trainingguide/">http://www.fhwa.dot.gov/context/trainingguide/</a>
FHWA	Integrating CSS into University Curricula	<a href="http://www.fhwa.dot.gov/context/activities.cfm#i1b">http://www.fhwa.dot.gov/context/activities.cfm#i1b</a>
FHWA	Integration of CSS into NHI and FHWA Training Courses	<a href="http://www.fhwa.dot.gov/context/activities.cfm#i1c">http://www.fhwa.dot.gov/context/activities.cfm#i1c</a>
FHWA	FHWA CSS Training Action Plan	<a href="http://www.fhwa.dot.gov/context/activities.cfm#i1e">http://www.fhwa.dot.gov/context/activities.cfm#i1e</a>
FHWA	CSS in Designing Major Urban Thoroughfares for Walkable Communities	<a href="http://www.fhwa.dot.gov/context/activities.cfm#i2c">http://www.fhwa.dot.gov/context/activities.cfm#i2c</a>
FHWA	Integration of Context Sensitive Solutions in the Transportation Planning Process	<a href="https://www.fhwa.dot.gov/planning/css/key_references/integrating/index.cfm">https://www.fhwa.dot.gov/planning/css/key_references/integrating/index.cfm</a>

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- II-14 Minnesota Department of Transportation
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- II-16 Minnesota Department of Transportation
- IV-4 [http://www.freefoto.com/images/41/05/41\\_05\\_72---Speed-limit-35-mph-road-sign\\_web.jpg?&k=Speed+limit+35+mph+road+sign](http://www.freefoto.com/images/41/05/41_05_72---Speed-limit-35-mph-road-sign_web.jpg?&k=Speed+limit+35+mph+road+sign)
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