

Chapter 1

Introduction

The New Jersey Department of Transportation (DOT) asked the Voorhees Transportation Policy Institute (TPI) to investigate possible changes in design standards for highways passing through New Jersey's communities.

Through case studies and surveys, the TPI study team discovered a burgeoning national movement away from strict reliance on highway design templates and toward flexible highway design, especially in the Northeastern and Northwestern United States. The movement seems rooted in the notion that the nation's highways are essentially complete, and working with existing roadways will require special sensitivity to context.

This report concludes the project but not the process, for structural changes can only be achieved with diligent follow-through on DOT's part.

1.1 Definitions

DOT originally gave this project the title "Flexible Design Standards for Highways through Communities." DOT's scope of work makes reference to Context-Sensitive Design (CSD). Some definitions are in order. Both flexible design and CSD call for less rigid application of design standards to highway projects. Flexible design involves utilizing the flexibility inherent in the current design process and in current national guidelines and state standards. CSD implies tailoring designs to adjacent land uses with sensitivity to community values. The *raison d'être* of this report is to promote, within DOT, flexibility in the interest of context sensitivity.

The project title also refers to "highways through communities," a broad phrase which requires some narrowing. Obviously, the need for flexibility and context sensitivity is greater for some highways than

others, as some impact their environments more directly. In deciding which highways through communities particularly demand context sensitivity, a label was needed. Main street was chosen as a catch-all for highways with mixed functions, not just channels for vehicular movement but places in their own right worth preserving and enhancing. To be sure, the term "main street" conjures up images of narrow shopping streets in tourist towns, and many at DOT feel their work lies elsewhere. But the TPI study team defines the term more broadly. It includes all highways and streets whose adjacent land uses require accommodation of pedestrians and bicyclists, serious consideration of street aesthetics, and a degree of traffic calming. As such, the term includes not only traditional shopping streets but

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Figure 1.1: Traditional shopping street, Cranbury, New Jersey.



Figure 1.2: Approach to Main Street, Lambertville, New Jersey.

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Figure 1.3: Commercial street, Newark, New Jersey.



Figure 1.4: Residential arterial, Princeton, New Jersey.

approaches to those streets, other commercial streets with small building setbacks, main roads with fronting residences, and other highways directly impacting people’s living environments.

This broad definition of main street was validated in a survey of local governments in New Jersey (see Appendix A.3). Absent a formal definition of “main street” in the questionnaire, mayors listed among main streets all manner of roadways, from traditional urban shopping streets to suburban arterials with commercial strips along them. If mayors define their main streets so broadly, it would be counter to the purpose of this project (reconciling DOT standards with local objectives) to define main streets too narrowly.

This broad definition was also validated in the visual preference survey given to the Technical Review Committee. Results confirmed our suspicion that main streets are distinguished not so much by

street geometrics as by roadside conditions and relative scale. Results suggested that main streets appear in many different contexts, not just as traditional shopping streets, and that given the right roadside conditions, main streets can be created out of conventional highways by dropping travel lanes, widening sidewalks, planting trees, and other such measures.

Based on scores assigned by the Technical Review Committee to street scenes (50 centerline photos of diverse roadways from throughout the United States), it appears that “main streetness” can be quantified (see Table 1.1). Important context variables include proportion of street frontage with trees, proportion of street frontage with active (pedestrian-generating) uses, sidewalk width, and building setback from the street. DOT could use this formula, or one like it derived through a similar process, to qualify individual highways for special treatment as main streets. The formula could be applied to roadways as they currently exist, or to roadways as redesigned to function more like main streets. It would only be necessary to establish a minimum threshold score, and quantify the variables that comprise the formula. See Appendix A.4 for a complete discussion.

Score=
2.22
+0.0149 * Trees
+0.0132 * Active Uses
+0.125 * Sidewalk
-0.0258 * Setback

Table 1.1: Main Street equation.

In New Jersey, additional guidance is available for distinguishing between main streets and state highways generally. The New Jersey State Development and Redevelopment Plan uses a “Centers” designation to plan for and direct growth within the

Center	County	Type	Center	County	Type
Hudson County	Hudson	Urban	Mystic Island	Ocean	Town
Jersey City	Hudson	Urban	Netcong	Morris	Town
Atlantic City	Atlantic	Urban	New Egypt	Ocean	Town
Camden	Camden	Urban	Pluckemin Village	Somerset	Town
Elizabeth	Union	Urban	Ridgefield	Bergen	Town
New Brunswick	Middlesex	Urban	Smithville	Atlantic	Town
Newark	Essex	Urban	Stone Harbor	Cape May	Town
Paterson	Passaic	Urban	Totowa	Passaic	Town
Trenton	Mercer	Urban	Tuckerton	Ocean	Town
Bridgeton City	Cumberland	Regional	Wanaque	Passaic	Town
Bridgewater-Raritan-Somerville	Somerset	Regional	Washington	Warren	Town
Dover	Morris	Regional	Washington Town Ctr	Mercer	Town
Long Branch	Monmouth	Regional	Woodstown	Salem	Town
Millville-Vineland	Cumberland	Regional	Wrangleboro Estates	Atlantic	Town
Morristown	Morris	Regional	Bedminster Village	Somerset	Village
Newton	Sussex	Regional	Cape May Point	Cape May	Village
Princeton	Mercer	Regional	Cranbury	Middlesex	Village
Red Bank	Monmouth	Regional	Crosswicks	Burlington	Village
Salem	Salem	Regional	Delmont	Cumberland	Village
Stafford	Ocean	Regional	Dorchester-Leesburg	Cumberland	Village
The Wildwoods	Cape May	Regional	Far Hills Borough	Somerset	Village
Andover	Sussex	Town	Heislerville	Cumberland	Village
Atlantic Highlands	Monmouth	Town	Hope	Warren	Village
Avalon	Cape May	Town	Hopewell	Mercer	Village
Bernardsville	Somerset	Town	Mendham	Morris	Village
Bloomington	Passaic	Town	Mt. Arlington (portion)	Morris	Village
Bound Brook	Somerset	Town	Oceanville	Atlantic	Village
Cape May	Cape May	Town	Oxford	Warren	Village
Elmer	Salem	Town	Parkertown	Ocean	Village
Flemington	Hunterdon	Town	Port Elizabeth-Bricksboro	Cumberland	Village
Freehold	Monmouth	Town	TDC Receiving Area	Burlington	Village
Gloucester City	Camden	Town	Vincentown	Burlington	Village
Haledon	Passaic	Town	Chesterfield	Burlington	Hamlet
Hightstown	Mercer	Town	Mauricetown		
Hopatcong	Sussex	Town	Station	Cumberland	Hamlet
Manasquan	Monmouth	Town	Mount Hermon	Warren	Hamlet
Manville	Somerset	Town	Sykesville	Burlington	Hamlet
Metuchen	Middlesex	Town	Route 130-Delaware River Corridor	Burlington	Strategic Plan

Table 1.2: Designated Centers 2001.

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state. Centers are urban areas ranging from the smallest hamlets to the largest cities—any place with a reasonable concentration of housing and commerce, and with good accessibility to the rest of the region. As of December 2001, the State Planning Commission had designated 73 Centers—eight Urban, 12 Regional, 31 Town, 18 Villages and four Hamlets (see Table 1.2). Over 200 additional Centers have been proposed.

Centers Policy 15 in the State Plan calls for scaled-down streets, accommodation of pedestrians, traffic calming, and place making within designated Centers. Perhaps most on-point, it calls for roadway design that reflects “adjacent land use conditions as well as the volume of traffic.” This is tantamount to a definition of context-sensitive design. Thus, the main street policies recommended in Chapter 2, would best be applied preferentially to main streets (as defined in Table 1.1) located within Centers (as designated in Table 1.2). By affording special status to streets within Centers, DOT can contribute directly to the overall goals of the State Plan.

1.2 Federal Initiatives

Sensitivity to community context would be difficult without recent changes in federal law. Beginning with the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, and continuing with

the National Highway System Act (NHS Act) of 1995 and Transportation Equity Act for the 21st Century (TEA-21) of 1998, the US Highway code now allows, and even encourages, a certain degree of flexibility in highway design.

Before 1991, all roads built in the U.S. and paid for even in part with federal funds had to meet guidelines in the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets* (the “Green Book” in Figure 1.5). If officials wanted to do something different, their only options were to seek design exceptions from the Federal Highway Administration (FHWA) or to build entirely with state and local funds.

ISTEA changed all that by creating a National Highway System (NHS) of Interstate and other high-performance highways, and a larger system of non-NHS highways eligible for federal funding under the newly established Surface Transportation Program. For roads not on the NHS, ISTEA gave states latitude to adopt their own design, safety, and construction standards (see Table 1.3). The NHS Act provided that even NHS highways (other than Interstates) could be designed with due consideration for “environmental, scenic, aesthetic, historic, community, and preservation” impacts. In 1997 the FHWA published *Flexibility in Highway Design*, which forcefully argued for flexible design within AASHTO guidelines (Figure 1.6).

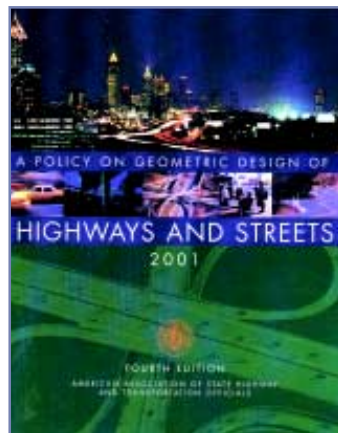


Figure 1.5: “Green Book,” AASHTO 2001.

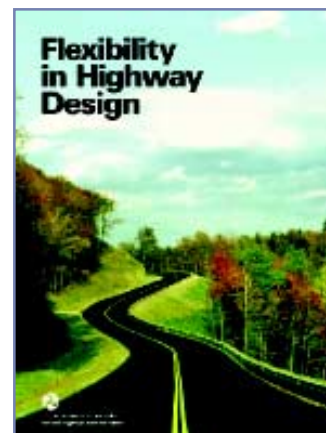


Figure 1.6: Flexibility in Highway Design, FHWA 1997.

Type of Road	New Construction	Rehabilitation Restoration Resurfacing
NHS, Interstate	AASHTO	state
NHS, non-Interstate	AASHTO/state	state
Non-NHS	state	state

Table 1.3: Control of standards by road type.

TEA-21 added language requiring highway projects to conform to local needs and allowing projects to be designed for desired rather than projected traffic levels. For a discussion of other relevant federal laws and initiatives, see Appendix A.5.

1.3 New Jersey Initiatives

Responding to widespread interest in context-sensitive design, the New Jersey State Legislature in re-authorizing the Transportation Trust Fund for 2000 declared that:

Many State highways run through fully developed cities and suburban towns. In addition, many small villages in rural areas have State highways, which pass through built-up residential areas or village centers. The traffic on many of these State highways, particularly large truck and speeding traffic, prevents these residential areas, town centers and future town centers from functioning as intended. The commissioner shall study this issue and develop a departmental program, which authorizes context-sensitive design and examines the functional classifications of State highways running through developed cities and suburban towns.¹

From this declaration, it is clear that DOT has a mandate to practice flexible highway design wherever the context demands it, as in town centers and built-up residential areas.

DOT has responded with several initiatives to promote CSD. It has sponsored what may be the nation's most ambitious training program for engineers. In the first round, 300 persons completed five day long courses on such unconventional topics as place making, respectful communication, conflict management, and traffic calming.

A second DOT initiative is the incorporation of planning and design guidelines for bicyclists and pedestrians, originally adopted in 1996, into the state's *Roadway Design Manual (RDM)*. Before incorporation, these guidelines will be updated to reflect changes in knowledge and practice. There is much new research on pedestrian safety, traffic calming has come into its own right, and AASHTO released a new set of bicycle guidelines in 1999.

A final initiative involves DOT's design exception policies. New Jersey may be the only state in the nation to provide programmatic design exceptions for rehabilitation, restoration, and resurfacing (3R) projects. A broadening of these exceptions has been proposed by DOT, and is supported by the findings of this report.

1.4 Content and Structure of Report

This report is organized into three chapters and six appendices. The first chapter, this Introduction, places flexible highway design in a state and national context.

Chapter 2, Findings and Recommendations, is the heart of the report. The first section on proactive roadway design suggests changes in the design process to increase context sensitivity. The second section makes the case for reclassification or de-designation of certain state highway segments now functioning as local main streets. The third section recommends changes in design exception policies to

¹ Congestion Relief and Transportation Trust Fund Renewal Act (Senate Bill 16). New Jersey Public Law 2000, Chapter 73, Section 6, revised 2000.

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promote context sensitivity and pedestrian safety. The fourth section proposes new design standards for main streets as part of Main Street Overlays. The fifth section recommends the incorporation of traffic calming guidance into the RDM to expand the design options available on main streets. The last section contains a conflicts-solutions matrix, offering practical solutions to conflicts between DOT standards and local objectives for main streets.

Chapter 3 contains local and regional Case Studies. There are four studies of context-sensitive design projects in New Jersey. One was written by a local practitioner and is rich in information about process and community objectives. The other three are engineering-oriented and follow a common format to permit easy comparison. There are six engineering-oriented case studies from nearby states. These represent a wider range of CSD projects than do the New Jersey studies. One additional case study was conducted in New Jersey, and four additional case studies were conducted in large metropolitan areas around the country. While not written up separately, these case studies were conducted in the same detail as the others and are given equal weight in our findings and recommendations.

Appendices are placed at end of the report. The first appendix introduces the project's Technical Review Committee (TRC) of leading experts in the field of context-sensitive design. The TRC reviewed the work at the mid-point of the project, provided case study information, and participated in the Main Street Visual Preference Survey. The second appendix is an article about this project published in *Planning* magazine. It reviews our findings in summary fashion. The next three appendices present results of surveys conducted for this project: a mail-out survey to all 566 New Jersey mayors to assess their experience with DOT main street projects; a visual preference survey administered to the TRC to define salient features of main streets; and a telephone survey of leading state DOTs to learn of policies, practices, and standards that might be applicable to New Jersey. The last appendix pro-

vides a summary of design exceptions granted by DOT from 1997 to 1999. To assess New Jersey's design exception policies and procedures, it was necessary to understand how these translated into actual practice.

The survey of leading state DOTs was presented at the 2001 Annual Meeting of the Transportation Research Board. It was one of two papers selected by TRB's Technical Activities Division for distribution to each state DOT.