

## Section 1

### Introduction

#### 1.1 Introduction

This manual presents the current Department guidelines pertaining to roadway design on the State Highway system ([www.state.nj.us/transportation/refdata/sldiag/](http://www.state.nj.us/transportation/refdata/sldiag/)). It provides a means of developing uniformity and safety in the design of a highway system consistent with the needs of the motoring and non-motoring users.

It is recognized that situations occur where good engineering judgment will dictate deviation from the current Department design guidelines. Any such deviations from design guidelines relative to the following controlling design elements (CDE's), as contained in Sections 4 through 7, will require an approved design exception (Except where Exempted by the *NJDOT Design Exception Manual*):

- Controlling Design Elements (Roadway)
- Stopping Sight Distance (vertical curves, horizontal curves, and non-signalized intersections)
- Superelevation (for mainline and ramps)
- Minimum Radius of Curve (for mainline and ramps)
- Minimum and Maximum Grades
- Cross Slope
- Lane Width (through and auxiliary)
- Shoulder Width
- Through Lane Drop Transition Length
- Acceleration and Deceleration Lane Length (for ramps)
- Horizontal Clearance (N/A in New Jersey – minimum allowable offset 0'-0")
- Design Speed (a design exception for a reduction in the design speed will not be approved)

#### Controlling Design Elements (Structural)

- Bridge Width
- Vertical Clearance
- Structural Capacity

The above Controlling Design Element (CDE) list is in accordance with the *Design Exception Manual*, 2004.

The guidelines contained in this manual, other than the CDE's shown above, are primarily informational or guidance in character and serve to assist the engineer in attaining good design. Deviations from this information or guidance do not require a design exception.

It is not the intent of this manual to reproduce all the information that is adequately covered by textbooks and other publications which are readily available to designers and technicians.

This manual, when used in conjunction with engineering knowledge of highway design and good judgment, should enable the designer to perform their job more efficiently.

The geometric design of streets and highways not on the State Highway system should conform to the standards as indicated in the current AASHTO – *A Policy on Geometric Design of Highways and Streets*. The design of traffic barriers and drainage systems shall conform to the *NJDOT Design Manual – Roadway* and the *NJDOT Drainage Design Manual* respectively.

## 1.2 Policy on Use of AASHTO Standards

The American Association of State Highway and Transportation Officials (AASHTO) has published policies on highway design practice. These are approved references to be used in conjunction with this manual. AASHTO policies represent nationwide standards that do not always satisfy New Jersey conditions. When standards differ, the instructions in this manual shall govern except on Interstate highways. The geometric design of the Interstate System, as a minimum, shall comply with the standards presented in the AASHTO publications; but the design of traffic barriers shall conform to the *NJDOT Design Manual – Roadway* and the design of drainage systems shall conform to the *NJDOT Drainage Design Manual*.

## 1.3 Reference Publications

- **Note: If there is a date given for the publication and a revised edition exists, use the current FHWA approved edition.**
- A. American Association of State Highway and Transportation Officials (AASHTO), American Association of State Highway Officials (AASHO)
  - AASHTO – *A Policy on Geometric Design of Highways and Streets*, 2004
  - AASHTO – *A Policy on Design Standards - Interstate System*, 2005
  - AASHTO – *Roadside Design Guide*, 2002
  - AASHTO – *A Guide for the Development of Rest Areas on Major Arterials and Freeways*, 2001
  - AASHTO – *Guide for the Development of Bicycle Facilities*, 1999
  - AASHTO – *An Informational Guide for Roadway Lighting*, (1984)
  - AASHTO – *Guide for the Planning, Design and Operation of Pedestrian Facilities*, 2004
  - AASHO – *Highway Definitions*, 1968
  - AASHO – *A Policy on U-Turn Median Openings on Freeways*, 1960
- B. Transportation Research Board (TRB)
  - TRB – *Highway Capacity Manual*, (2000)
- C. Federal Highway Administration (FHWA)
  - FHWA – National Transportation Communications for ITS Protocol, <http://www.ntcip.org/info/>
  - FHWA – Federal-Aid Policy Guide (FAPG), (1991 with Updates)
  - FHWA – Roundabouts: An Informational Guide, (2000), Publication No. FHWA-RD-00-067
  - FHWA – *Americans with Disabilities Act Accessibility Guidelines*, (1994, as amended)
  - FHWA – *Roadway Lighting Handbook*, (1978 and Addendums)
  - FHWA – Pedestrian Facilities Users Guide: Providing Safety and Mobility Publication No. FHWA-RD-01-102 (1999)
  - System Engineering Guidebook for ITS, (2007), [www.fhwa.dot.gov/cadiv/segb](http://www.fhwa.dot.gov/cadiv/segb)
  - FHWA – Manual on Uniform Traffic Control Devices, (2003)
- D. Institute of Transportation Engineers (ITE)
  - ITE – *Alternative Treatments for At-Grade Pedestrian Crossings*, (2001)

## E. Illuminating Engineering Society North America (IESNA)

- IESNA – *Lighting Handbook*, 9th (2000)

## F. National Fire Protection Association

- *National Electrical Code (NEC)*, (2008)
- *National Electrical Code (NEC) Handbook*, (2008)

## G. New Jersey Department of Transportation (NJDOT)

- NJDOT – *Bicycle Compatible Roadways and Bikeways: Planning and Design Guidelines*, (1996)
- NJDOT – *Pedestrian Compatible Planning and Design Guidelines*, (1996)
- *NJ Statewide ITS Architecture*, (2005)

## H. National Committee on Uniform Traffic Laws and Ordinances (NCUTLO)

- NCUTLO – *Uniform Vehicle Code*, (2000)

## I. United States Access Board

- ADA Access Board – *Recommendations for Accessibility Guidelines: Recreational Facilities and Outdoor Developed Areas*, (Published in the Federal Register July 23, 2004 and amended August 5, 2005)

## J. Miscellaneous

- Chicagoland Bicycle Federation BLOS/BCI Form - <http://www.bikelib.org/roads/blos/blosform.htm> - Calculator for Bicycle Level of Service and Bicycle Compatibility Index