CHAPTER 1

INTRODUCTION & DESIGN MANUAL PURPOSE
1. Introduction & Design Manual Purpose

1.1. Design Manual Purpose

The purpose of the State of Wisconsin ITS Design Manual is to give engineers familiar with ITS elements the process and information necessary to design intelligent transportation system (ITS) elements for WisDOT. ITS elements have many similarities to traffic signal and roadway lighting elements, but also have many unique characteristics and considerations. The intended audience for the Design Manual is WisDOT district traffic staff, district design staff, and consultants. The design manual is written at a level that assumes that some working knowledge of signal design, roadway signing design, and electrical design as it applies to roadway design elements.

1.2. Design Manual Updates

This manual is intended to be a living document, hence, it will be revised periodically to reflect new requirements. It will also be changed to make it more useful to its readers. The manual is maintained by the Division of Transportation Infrastructure Development - Bureau of Highway Operations (DTID-BHO). The procedure to revise the manual is explained below.

1. Notify Bureau of Highway Operations - Design manual users should contact the BHO. They should explain any problems or errors they perceive with the manual and provide a proposed solution. The key is to be specific in identifying what the problem is, where it exists in the manual and how you think it can be fixed.

2. Research Issue - The BHO will research the issue. This may involve coordinating with other agencies to ensure the proposed solution does not conflict with other requirements in the manual or in outside reference manuals. A log will be kept of proposed changes, originators, and outcomes.

3. Draft changes to the Manual - The BHO will draft changes to the chapter and coordinate with other chapter originators to ensure the change is incorporated into other chapters as necessary. The manual will be revised and updated approximately twice per year.

4. Edit and Publish Changes - The BHO will edit the proposed changes and publish them on-line at the internet site where the manual is held and maintained.

1.3. Outside References

Various documents are required to perform ITS design as outlined in this manual, and are referenced as follows:

- Wisconsin Dept. of Transportation Facilities Development Manual (FDM)
- Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD)
- Manual on Uniform Traffic Control Devices, Wisconsin Supplement
- American Association of State Highway Transportation Officials (AASHTO) Roadside Design Guide
1.4. Design Manual Organization

The organization of the design manual is broken into individual chapters, each with individually focused areas. Chapter 2 outlines the ITS Project Development Process, expanding upon the process as outlined in the Department’s Facilities Development Manual. It elaborates on special considerations for the five steps outlined in the FDM, and outlines additional steps that are required in ITS project development. Chapter 2 also illustrates how this manual fits in with the District 2 ITS Program Development Process.

Chapters 3 through 16 outline individual ITS element designs. These chapters follow a common theme, outlined as follows:

- **Introduction and Usage** - A brief description of the element being profiled in the chapter is given, as well as common uses in the ITS field.
- **Basic Types** - Each element can be broken down into several types or categories, whether it be the type of ramp meter, technology of a variable message sign, or classification of a crash investigation site.
- **Design Process** - This section previews many of the following subsections within the chapter, stepping the designer through the method used to design the element discussed.
- **Communication Requirements** - Although communication systems is a separate chapter in the manual, each individual ITS element has separate communication requirements. A subsection outlining the communication requirements has been developed for each individual element. This subsection refers to Chapter 9 - Communication Systems.
- **Power Requirements** - A section describing power service requirements is outlined for each element chapter. This section includes information such as service ratings, meter locations and requirements, and the process required to obtain electrical service.
- **Details** - A list of construction details previously used in P.S. & E. development of the individual elements are listed in tabular format, and cross-referenced with Appendix A - Construction Details.
- **Special Provisions** - A list of special provisions previously used in P.S. & E. development of the individual elements are listed in tabular format, and cross-referenced with Appendix B - Special Provisions.

Chapters 17 through 19 serve as placeholders for future development. Chapters 20 through 22 serve as appendices to this manual. Chapters 20 and 21 are compilations of construction details and special provisions previously used in ITS deployment contracts in Wisconsin. Chapter 22 provides an overview of loop detector inductance calculation.