

# New Jersey DOT Survey Manual

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# Preface

## Purpose

Many State Departments of Transportation have developed a survey manual. The purpose of the manual is to provide uniform guidelines for implementing survey decisions, and to assure quality and continuity in collection of survey data. The use of the survey manual is to assure appropriate execution of projects in conformity with the operational needs of the Department of Transportation, and to assure compliance with State and Federal criteria. The objective of this manual is not to serve as a general purpose text on the practice of surveying but rather as a guide to fit the special needs of the New Jersey Department of Transportation. Basic education and training in surveying require appropriate schooling, seminars and field exercises with appropriate textbook and learning kits. At the end of this manual there is a suggested reference list, including some helpful Web sites.

This manual deals with technical surveying issues. Other issues such as professional conduct and safety procedures should be in accordance with appropriate Federal and State manuals. For example, all the procedures at NJDOT with respect to safety, traffic protection, operation of tools and equipment, vehicle operation and usage, and first aid must be in accordance with the latest edition of NJDOT “safety manual”. To avoid duplications and potential conflicts with existing regulations, this survey manual does not include these procedures.

## Content and Format

Survey manuals of other State Department of Transportations follow one of two general conceptual models. Some manuals provide detailed instructions for surveyors, while others take the form of a more general reference guide used by DOT employees and Consultants, who are not necessarily surveyors. The purpose of the first approach is to produce a prescriptive manual to train people in surveying. The danger in such a detailed manual is that it could become easily outdated due to rapid technological developments. Such a manual may require frequent maintenance and revisions to keep it current. The second approach is more technology independent and used to educate its readers about surveying. This education provides proper understanding of surveying and improves the communication among various DOT employees. This manual follows the latter approach. The model used in developing this manual was the Ohio DOT (ODOT) survey manual.

The criteria included in this manual have been developed along the lines of various State's survey manuals, as well as in conformance with applicable Department directives, policies and procedures. The manual assures uniform guidelines for implementing survey decisions, assure quality and continuity in collection of survey data and execution of project support of operations in New Jersey, and assures compliance with Federal criteria. Consideration must also be given to submission standards adopted by city, county, or other local governments when submitting documentation under their jurisdiction.

The manual consists of seven chapters and an appendix. The first chapter deals with general terms and definitions of surveying and surveying related terms. Chapter two describes the various survey systems. Survey systems are, to some extent, technology free concepts that serve as a foundation for different types of surveys. Chapter three deals with survey measurements and the errors associated with them. Chapter four is a continuation of chapter three and focuses on Global Positioning Systems (GPS). GPS is somewhat a different surveying technique served better with its own chapter. Chapter five discusses surveying equipment, its characteristics, and proper usage. Chapter six discusses location surveys and some field procedures. Photogrammetry is discussed in the last chapter. Photogrammetry is another surveying technique that is somewhat different compared with the traditional surveying. The special chapter serves as a means for emphasizing the applicability and the recommended utilization of photogrammetry as an integral part of the surveying tool box.

## **Preparation**

The NJDOT Survey Manual was developed through the cooperation and effort of numerous staff members and the surveying program of the New Jersey Institute of Technology. Errors or omissions should be reported to the Bureau of Civil Engineering, Office of Survey Services, New Jersey Department of Transportation, PO Box 600, Trenton, New Jersey 08625.

## **Revisions**

Updating the manual will be a continuous process and revisions will be issued periodically. Some of the revisions will become necessary as a result of changes in specifications and methodology, while others result from user feedback. All manual users are encouraged to suggest modifications and improvements to this manual, in writing, to the Bureau of Civil Engineering, Office of Survey Services, at the New Jersey Department of Transportation.

Submit Manual orders to the Bureau of Civil Engineering, Office of Survey Services, New Jersey Department of Transportation, or check the Department's web site to download the latest version.

## Acknowledgment

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