



Traffic Engineering, Operations & Safety Manual

Chapter 4 Signals

Section 3 Field Investigation Guidelines

4-3-1 Field Investigation Introduction

April 2025

Prior to commencement of plan preparation, a field investigation **shall** be conducted at the location proposed to be signalized, or at the site of the existing signal to be modified. The purpose of the field investigation **shall** be to verify and/or collect data on existing field conditions to facilitate plan preparation and identify potential utility conflicts prior to actual construction. In addition, the field investigation will enable the proposed electrical service location to be identified early on, which *may* or *may not* affect the location of the controller cabinet.

State-Owned Signal (either State Administered or Permit) Project

The signal designer **shall** coordinate with the Regional Traffic Unit prior to the field investigation. The Regional Traffic Unit will work with the local utility company and signal designer to determine the most appropriate location for the traffic signal control cabinet for state owned signal projects.

Locally Owned Signal (State Administered Project) (i.e., municipality, county, connecting highway)

The signal designer **shall** coordinate with the local agency that owns the signal prior to the field investigation.

4-3-2 Intersection Inventory

April 2025

GEOMETRICS

Existing intersection and approach geometrics **shall** be verified in the field, including but not limited to:

- Approach grade
- Lane usage
- Lane widths
- Parking
- Left- and right-turn channelization
- Sight distance restrictions
- Sidewalks
- Bike paths
- Posted speed limit
- Other related information

Furthermore, information regarding right of way and drainage **shall** be checked. Right of way restrictions *may* require permanent easements to be obtained for the placement and maintenance of traffic signal equipment. Drainage characteristics *should* be taken into consideration to avoid placement of signal equipment, particularly controller cabinets in low points or flow lines.

Further investigation *may* be necessary to address certain special conditions, which could include the need for emergency pre-emption, signal interconnection, and accommodation of handicapped persons.

UTILITY CONFLICTS

Diggers Hotline (1-800-242-8511 or 811) **shall** be contacted during the design stage to determine the location of existing utilities. Marked locations for state-owned electrical facilities will need to be arranged through the Diggers Hotline.

Information regarding existing utilities from locates **shall** be incorporated into the preliminary signal plan. The utility information **shall** be verified during the field investigation and potential conflicts noted. Utility conflicts *may* consist of both underground and aboveground conflicts. Attention **shall** be given to underground utilities that could conflict with foundations for mast arm poles. At grade and aboveground utilities such as manholes and overhead lines **shall** be checked to avoid conflicts with proposed mast arms, pull boxes, concrete bases, and detection.

Signal poles and mast arms **shall** be a minimum of 10 feet from all overhead utilities. The designer **shall** contact the local utility companies for specific guidelines.

CONTROL CABINET LOCATION

Generally, electrical service disconnect *should* be located at or near the control cabinet.

For state-owned signals, the Regional Traffic Unit **shall** determine the placement of the control cabinet based on safety, visibility and aesthetics (i.e., to avoid placement on residential properties, etc.), not necessarily on service location. The electrical service provider **shall** be contacted prior to plan preparation to verify the location of the electrical service relative to the control cabinet, and what, if any, charges *may* apply.

For locally owned signals on state administered projects (i.e., municipality, county, connecting highway), the signal designer **shall** coordinate with the local agency who owns the signal prior to the plan preparation for the control cabinet and service location.

CHECKLIST

The field investigation **shall** include a thorough investigation of the location to familiarize the designer with the characteristics unique to that location. To facilitate the field investigation and design of the traffic signal, the designer *should* follow the guidelines listed below. In addition, the field investigation checklist *should* be completed during the investigation and filed with other project documentation.

1. A topographic survey of the location *should* be obtained prior to conducting the field investigation. The information represented on the survey *should* be verified for accuracy and include discrepancies noted during the field investigation. Information not included on the survey but observed in the field, *should* be added.
2. A photographic log of the location *should* be taken which could include photos of all approaches and photos of all the quadrants, at the intersection. This information could be used for the Signal Investigation Study and is useful during the design of the traffic signal installation.
3. The field investigation *should* be conducted when weather conditions are favorable.

The following field investigation checklist has been created by the Department for use during field visits. This list is a general checklist of items which *should*, as a minimum, be documented during the field investigation.

FIELD INVESTIGATION CHECKLIST

Intersection Geometrics

- ☐ Angles of intersecting streets
- ☐ Approach grades
- ☐ Physical features (pavement type, streetscaping, curb & gutter, loading zone, sidewalks, bike paths, shoulders, etc.)
- ☐ Distance to bridge approaches
- ☐ Corner radii (evidence of wheel tracking behind curb/median)
- ☐ Right turn movements (yield/stop conditions)
- ☐ Width of streets and travel lanes
- ☐ Lane usage and dimensions
- ☐ Turning lane storage length
- ☐ Roadway entrances within 500 feet on minor approaches and 1000 feet on Major approaches (driveways)
- ☐ One way streets
- ☐ Bus stops and loading zones
- ☐ Turning restrictions
- ☐ Future street connections at T-intersections

Pavement

- ☐ Existing pavement markings (stop bar locations, crosswalks, lane assignments)
- ☐ Concrete to asphalt joint locations
- ☐ Areas of extreme pavement distress (pavement rutting, alligator cracking)

Traffic Control Devices

- ☐ Location and message of roadside signs
- ☐ Railroad preemption/battery back-up system and/or potential preemption for emergency centers in vicinity
- ☐ Location and operation of existing signals and/or adjacent signals of state or another agency
- ☐ Existing speed limits
- ☐ Existing traffic signal standard/pole, controller, detector, etc. locations
- ☐ Potential locations for proposed underground signal facilities (potential bridge crossing for conduit)

Utilities

- ☐ Existing municipal lighting
- ☐ Utility locations including possible service location
- ☐ Overhead restrictions (phone/electrical lines, height restrictions)

Adjacent Land Use

- ☐ Right of way or property lines
- ☐ Current land use (schools, trucking, elderly housing)
- ☐ Existing site distance obstructions (buildings, trees, fences, outdoor advertising)
- ☐ Emergency use (fire station, police station, hospital, etc.)

Other

- ☐ Drainage features (culverts, catch basins, manholes, ditch bottoms, etc.)
- ☐ Parking restrictions