

**CHAPTER 2: PROJECT PROCEDURES / PROCESSES**

**2.1 GENERAL..... 1**

**2.2 PROJECT DEVELOPMENT PROCESS..... 1**

    2.2.1 Scoping Phase ..... 2

    2.2.2 Phase I Design ..... 3

    2.2.3 Phase II Design ..... 4

    2.2.4 Phase III Design ..... 5

    2.2.5 Phase IV Design..... 6

**2.3 ARCHIVE DRAWINGS ..... 8**

**2.4 INTEGRATED PROJECT MANAGER (IPM) ..... 8**

**2.5 SUPPORTIVE DATA REQUESTS ..... 8**

**2.6 BRIDGE DATA REQUESTS ..... 9**

**2.7 PROPRIETARY SIGNAL EQUIPMENT REQUESTS ..... 9**

## 2.1 GENERAL

There are project procedures and processes that are common to every project throughout design development. These procedures and processes are briefly discussed and related references or hyperlinks are provided for further instruction.

## 2.2 PROJECT DEVELOPMENT PROCESS

The purpose of this section is to define the traffic engineering activities and deliverables as they relate to VDOT's Project Development Process.

As part of the Project Development Process the term Concurrent Engineering Process (CEP) is widely used to indicate the importance of multiple disciplines working together, not only on their "individual" project related activities, but also in a "coordinated" effort that is required to meet major project milestones during project development.

The CEP requires teamwork, cooperation and interaction between the various disciplines. Information must be shared freely and in a timely manner. To support this flow of information, there are five major design phases in the Project Development Process. Each design phase is concluded with a major project milestone team meeting. The following are the Project Development Process phases and milestone meetings.

<u>Design Phase</u>	<u>Team Meeting</u>
Scoping	Scoping Team Meeting
Phase I Design	Preliminary Field Inspection Team Meeting
Phase II Design	Public Hearing Team Meeting
Phase III Design	Field Inspection Team Meeting
Phase IV Design	Pre-Advertisement Conference

Each design phase and milestone team meeting advances the design project to the Advertisement date. An overview of the traffic engineering design activities for each design phase and the deliverables to be shared with the various engineering disciplines are presented in this section. The traffic engineering design activities include:

- Sign Design
- Pavement Marking / Marker Design
- Traffic Signal Design
- Roadway / Interchange Lighting Design

## 2.2.1 Scoping Phase

### **SCOPING TEAM MEETING**

The Scoping Team Meeting is the first inter-disciplinary team milestone. The Scoping meeting allows all project participants to define the elements that will comprise the project, the working budget, and the schedule for designing and developing the project. Example agencies participating in the Scoping Team Meeting may include Mobility & Transportation Planning, Location & Design, Traffic Engineering / Central Office, Districts, the Maintaining Jurisdiction and others as required by the project.

The purpose of the Scoping team meeting is to:

- Define the project scope.
- Evaluate project limits.
- Discuss project schedule.
- Evaluate initial project budget estimate.

#### **Design Elements**

##### **Traffic Engineering Overview**

- Evaluate Project Limits and determine the Maintaining Jurisdiction

##### **Sign Design**

- Determine type of signs and structures to be included in project
- Evaluate conceptual roadway typical section
- Identify survey limits needed for signing
- Determine agency and contact person responsible for maintenance
- Determine agency and contact person responsible for design
- Develop project budget estimates

##### **Pavement Marking / Marker Design**

- Determine type and special design details of pavement markings / markers
- Evaluate conceptual roadway typical section
- Identify survey limits needed for pavement markings / markers
- Determine agency and contact person responsible for maintenance
- Determine agency and contact person responsible for design
- Develop project budget estimates

##### **Traffic Signal Design**

- Determine intersections to be signalized or modified
- Determine facilities such as schools, safety service center, etc. that will require traffic signal devices
- Identify survey limits needed for traffic signals
- Determine agency and contact person responsible for maintenance
- Determine agency and contact person responsible for design
- Develop project budget estimates

##### **Roadway / Interchange Lighting Design**

- Identify facilities / areas requiring lighting
- Identify type of lighting standards to be considered
- Evaluate conceptual roadway typical section
- Determine agency and contact person responsible for maintenance
- Determine agency and contact person responsible for design
- Develop project budget estimates

**TIMETABLE / LEVEL OF DETAIL**

- Scoping activities occur prior to the Scoping Team Meeting.
- Identify design elements for all TCDs.
- Verify the proposed schedule and cost estimates.

**SCOPING TEAM MEETING OUTPUT**

- Submit initial project budget estimate for each design element.
- Confirm estimated advertisement date is attainable.
- Identify TCD designer (Central Office In-House Design, TCD Consultant, District, Roadway Design Consultant, etc.).
- Identify process for Community Outreach / Communications Plan.

**2.2.2 Phase I Design****PRELIMINARY FIELD INSPECTION TEAM MEETING**

The Preliminary Field Inspection (PFI) is an inter-disciplinary team milestone to allow managers/designers of different disciplines to review a preliminary set of plans. L&D will develop the roadway design for review and acceptance of “alignment and grade”. Example agencies participating in the Preliminary Field Inspection Team Meeting may be Location & Design, Districts, the Maintaining Jurisdiction and others as required by the project.

The purpose of the PFI team meeting is to:

- Serve as a “kick-off” point for major task work to begin for TCDs.
- Facilitate stakeholders and the project managers in determining that the alignment and grades of the roadway design are compatible with the concept plans of the various disciplines.
- Serve as a milestone for all disciplines to gauge their own task status in relation to the project.

**Design Elements****Traffic Engineering Overview**

- Review roadway geometry, median breaks
- Send Questionnaires to Maintaining Jurisdiction for design criteria

**Sign Design**

- Verify appropriate roadway geometry, typical sections and right of way is adequate for signing
- Update project budget estimates

**Pavement Marking / Marker Design**

- Verify appropriate transitioning is provided at project limits
- Update project budget estimates

**Traffic Signal Design**

- Perform or obtain the warrant, capacity and operational analyses
- Verify appropriate roadway geometry, typical sections and right of way is adequate for signalization
- Identify any proprietary equipment requests
- Update project budget estimates

**Roadway / Interchange Lighting Design**

- Perform warrant analyses
- Verify appropriate roadway geometry, typical sections and right of way is adequate for lighting
- Establish the lighting design criteria
- Update project budget estimates

**TIMETABLE / LEVEL OF DETAIL**

- Phase I Design activities occur after the Scoping Team Meeting and prior to the Preliminary Field Inspection Team Meeting.
- During this phase of design, TCD activities are limited to verifying scoping issues have been accommodated.
- Refinement or adjustments of the construction cost estimates are to be performed for all TCD elements to ensure the budget is current and accurate.

**PRELIMINARY FIELD INSPECTION TEAM MEETING OUTPUT**

- Discuss the functionality of initial roadway design as related to traffic engineering.
- Discuss any deficiency with the roadway geometry with regard to TCD infrastructure installation.
- Submit updated construction cost estimates.

**2.2.3 Phase II Design****PUBLIC HEARING TEAM MEETING**

The Public Hearing (PH) Meeting is an inter-disciplinary team milestone to allow managers/designers of different disciplines to review a set of plans and design prior to public hearing. Example agencies participating in the Public Hearing Team Meeting may be Location & Design, Districts, Environmental, Right of Way / Utilities, the Maintaining Jurisdiction, Private Utility Companies and others as required by the project.

The purpose of the PH team meeting is to:

- Evaluate and check of project progression.
- Allows coordination between disciplines and stakeholders prior to public hearing.

**Design Elements****Traffic Engineering Overview**

- Review draft of MOT plans, if available

**Sign Design**

- Perform sign inventory (as needed)
- Prepare sign base plans
- Develop conceptual sign plans for major design features
- Advise Structure and Bridge designer whether sign infrastructure needs to be included in bridge design
- Verify right of way or easement are provided for sign infrastructure
- Coordinate with other design disciplines
- Update project budget estimates

**Pavement Marking / Marker Design**

- Prepare pavement markings / markers base plans
- Develop conceptual pavement markings / markers plans
- Verify roadway geometry and lane transitions are sufficiently designed
- Coordinate with other design disciplines
- Update project budget estimates

**Traffic Signal Design**

- Perform traffic signal inventory (as needed)
- Prepare traffic signal base plans
- Develop conceptual traffic signal plans for major design features
- Advise Structure and Bridge designer whether signal infrastructure needs to be included in bridge design
- Verify right of way or easement are provided for signal infrastructure
- Identify electrical power source
- Develop conceptual plans for traffic signal devices for schools, fire and rescue stations, etc.
- Coordinate with other design disciplines
- Update project budget estimates

**Roadway / Interchange Lighting Design**

- Perform lighting analysis
- Prepare lighting base plans
- Develop conceptual lighting plans for major design features
- Advise Structure and Bridge designer whether lighting infrastructure needs to be included in bridge design
- Verify right of way or easement are provided for lighting infrastructure
- Identify potential control center locations
- Coordinate with other design disciplines
- Update project budget estimates

**TIMETABLE / LEVEL OF DETAIL**

- Phase II Design activities occur after PFI and prior to the Public Hearing Team Meeting.
- Conceptual TCD designs are initiated.
- Impacts to Right of Way and Utilities are identified.

**PUBLIC HEARING TEAM MEETING OUTPUT**

- Discuss conceptual design plans of major features for TCDs.
- Submit updated project budget estimates.
- Confirm that estimated advertisement date is attainable.

**2.2.4 Phase III Design****FIELD INSPECTION TEAM MEETING**

The Field Inspection (FI) is an inter-disciplinary team milestone meeting to allow managers/designers of different disciplines to review a current set of plans for a project. Example agencies participating in the Field Inspection Team Meeting may be Location & Design, Districts, Environmental, Right of Way / Utilities, the Maintaining Jurisdiction, Private Utility Companies and others as required by the project.

The purpose of the FI team meeting is to:

- Show all TCD infrastructure associated with the design.
- Identify all major features that might affect the right of way.
- Serves as the initial stage for acquisition of right of way.
- Serves as the initial stage for the development of final construction plans.

**Design Elements****Traffic Engineering Overview**

- Review MOT plans, if available

**Signing Design**

- Address Public Hearing comments
- Update conceptual sign plans with current roadway and utility plans
- Coordinate with other design disciplines
- Update project budget estimates

**Pavement Marking / Marker Design**

- Address Public Hearing comments
- Update conceptual plans with current roadway and utility plans
- Coordinate with other design disciplines
- Update project budget estimates

**Traffic Signal Design**

- Address Public Hearing comments
- Update conceptual plans with current roadway and utility plans
- Coordinate with other design disciplines
- Update project budget estimates

**Roadway / Interchange Lighting Design**

- Address Public Hearing comments
- Update conceptual plans with current roadway and utility plans
- Coordinate with other design disciplines
- Update project budget estimates

**TIMETABLE / LEVEL OF DETAIL**

- Phase III Design activities occur after Public Hearing and prior to the Field Inspection Team Meeting.
- Activities advance the TCD conceptual designs to preliminary design plans and ensure that appropriate right of way is provided.
- Refinement or adjustments of the project budget estimates are to be performed for all TCD elements to ensure the budget is current and accurate.
- Verify design conflicts have not evolved from other design disciplines.

**FIELD INSPECTION TEAM MEETING OUTPUT**

- Submit preliminary designs for TCDs.
- Submit updated project budget estimates.
- Confirm that estimated advertisement date is attainable.

**2.2.5 Phase IV Design****PRE-ADVERTISEMENT CONFERENCE**

The Pre-Advertisement Conference (PAC) is an inter-disciplinary team milestone that allows managers/designers from different disciplines to review the final plans. Example agencies participating in the Pre-Advertisement Conference may be Location & Design, Districts, Environmental, Right of Way / Utilities, the Maintaining Jurisdiction, Private Utility Companies and others as required by the project.

The purpose of the PAC team meeting is to:

- Ensure that all disciplines are aware of the current project status including schedule and budget.
- Serve as a milestone to replace the formal first submission of plans.
- Ensure that the plans are virtually complete (95%) where only minor adjustments to the quantities may be required.
- Ensure that special provisions and special provision copied notes are complete.

### **Design Elements**

#### **Signing Design**

- Prepare construction plans, construction cost estimate, special provisions and special provision copied notes

#### **Pavement Marking / Marker Design**

- Prepare construction plans, construction cost estimate, special provisions and special provision copied notes

#### **Traffic Signal Design**

- Prepare construction plans, construction cost estimate, special provisions and special provision copied notes

#### **Roadway / Interchange Lighting Design**

- Prepare construction plans, construction cost estimate, special provisions and special provision copied notes

### **TIMETABLE / LEVEL OF DETAIL**

- Phase IV Design activities occur after FI and prior to the Pre-Advertisement Conference.
- Activities advance the preliminary design to 80% design submission, QC design submission and then to construction plans that will be made available for advertisement.
- Pay items and quantities are measured and submitted for entry into TRNS-PORT at the QC submission and update at the Pre-Advertisement submission for all TCD designs.

### **PRE-ADVERTISEMENT CONFERENCE OUTPUT**

- Submit Pre-Advertisement construction plans, specifications, special provisions and final estimates for the TCDs to the Project Manager.

Further information on finalizing plans and the plan submittal process is available in the [VDOT Road Design Manual, Chapter 2G – Construction Plans](#).



### 2.3 ARCHIVE DRAWINGS

Design plans must be archived at various stages of development. Archiving design files provides a complete copy of the design at the time of archiving. For the procedures and CEP design stages that plans must be archived, refer to:

<http://www.virginiadot.org/business/locdes/default.asp>

The information regarding archiving design files is located under the heading Automated Engineering Support – “Electronic Plan Submission”. A design flow chart and hyperlinks to Archive Drawings is provided at this website.

### 2.4 INTEGRATED PROJECT MANAGER (IPM)

Integrated Project Manager (IPM) is a database program that is used by project managers and designers to assist them in tracking the project’s scope, schedule and cost estimates from project inception to bid opening.

Features of the IPM:

- Provides project’s status reports using project related data (e.g. cost, history, schedule, milestones, status of the project, descriptive facts, bid dates, advertising, etc.).
- Allows various divisions to provide input or review project information for scheduling, tracking and coordination.
- Permits authorized personnel to implement project information changes.
- Contains a Traffic Engineering Subsystem.

### 2.5 SUPPORTIVE DATA REQUESTS

The Supportive Data Request form ([Form #LD-252](#)) is distributed to all design disciplines by the Location and Design Division, Project Manager. Form #LD-252 is distributed at project inception and provides information and data that will aid the project manager in developing the scope for project.

## 2.6 BRIDGE DATA REQUESTS

Structure and Bridge Division will require information on all TCDs to be installed on bridges. This information is initiated with [Form LD-153](#).

Upon receipt of Form LD-153, the Traffic Engineering Design Section will determine whether the bridge will require:

- Roadway Lighting (on and under bridge)
- Pedestrian Fences / Screening
- Special Requirements for Sign Mounting or Signals
- Conduits for Communications or Power Service

If the response to the Form #LD-153 involves the need for any of the above TCDs to be constructed on the bridge, then two copies of the preliminary bridge design plans will be sent to the Traffic Engineering Design Section. The Traffic Engineering Project Coordinator will detail the following information on the preliminary bridge plans.

- Roadway / Bridge Lighting – design requirements such as locations of light pole blisters on the bridge structure, underbridge lighting supports, conduits, and junction boxes.
- Pedestrian Fencing – identify where pedestrian fencing is warranted for the bridge.
- All other necessary TCDs that will be installed on the bridge will need to be located and detailed, such as sign mount structures and signals or conduits for carrying TCD communications or power.

An example of an Intra-Departmental Memorandum response and Bridge Data Request is provided in [Appendix IA-1](#) and [Appendix IA-2](#), respectively.

## 2.7 PROPRIETARY SIGNAL EQUIPMENT REQUESTS

Specifying proprietary signal controllers and cabinets on VDOT projects must be requested and authorized prior to project advertisement. The procedure and an example form letter requesting authorization are available in [Appendix IA-3](#) and [Appendix IA-4](#).