

**Chapter Fifteen**  
**PROJECT DEVELOPMENT PROCESS**

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## Chapter Fifteen

# PROJECT DEVELOPMENT PROCESS

### (Management Unit 4700 — Signing and Pavement Markings)

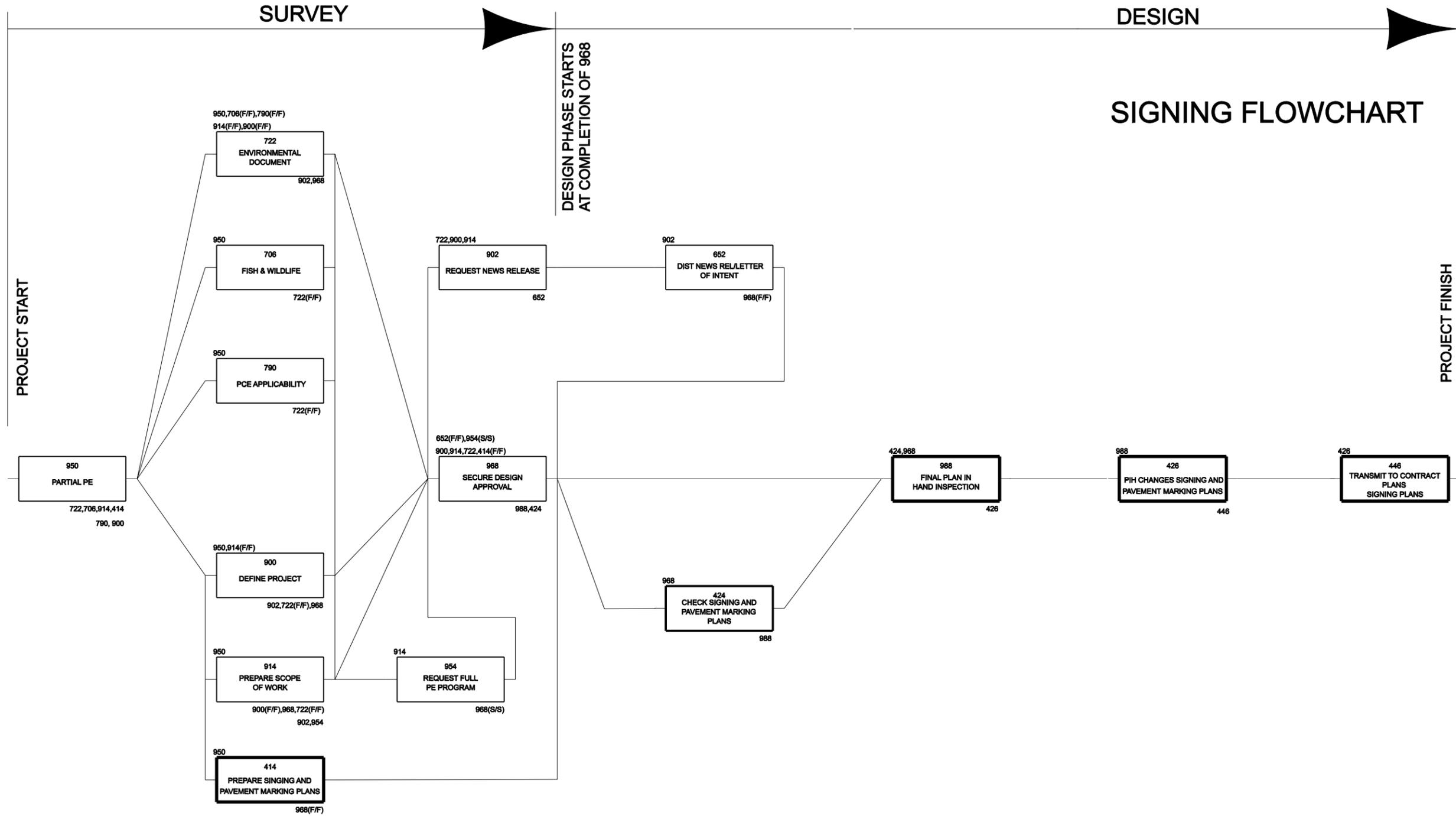
#### 15.1 GENERAL

Figure 15.1A illustrates the basic project development approach used by MDT for a typical project. Chapter Fifteen discusses the activities of the Traffic Engineering Section's Signing and Pavement Markings Unit within this project development process. For a complete description of the activities for all the Units and Sections, the user should review the activity descriptions, which is on the Department's intranet. In using Chapter Fifteen, the user should consider the following:

1. Precedence Activity Network. The network or flowchart in Figure 15.1A is a precedence activity network. An "activity" occurs when a significant, discrete event occurs and/or when the responsibility for the project (activity) is transferred from one unit to another. The "precedence" nature of the network implies that an activity cannot occur until all activities preceding that one have been completed. However, the user must be aware that some flexibility is necessary to apply this network to project development.
2. Project Application. The network represents the typical process where the Signing and Pavement Marking Unit would be involved in the project. Not every activity will be applicable to every project; i.e., some activities will represent "zero" time on relatively minor projects. Also, not all activities that may be required on a project are shown. However, the user should find that projects which are developed according to this process will have fewer management problems.
3. Lines of Communication. The rigid application of the network would lead to predetermined, precise points at which communication occurs between units. This is neither realistic nor desirable. Communication between units must be continuous. This will result in fewer problems and fewer "surprises" in project development.
4. Signing and Pavement Marking Unit. The Signing and Pavement Marking Unit's activities have been highlighted on the network shown in Figure 15.1A. Note that in some instances the Lead Design Group will be the Signing and Pavement

Marking Unit. In these cases, the Unit will need to closely review the project development process to ensure all appropriate activities are conducted.

5. Other Manual Chapters. The Montana Traffic Engineering Manual contains several other chapters which provide complementary information to Chapter Fifteen. The designer should review these chapters for more information on the project development process. In particular, Chapter Fifteen should be used in combination with [Chapter Sixteen “Project Coordination \(Signing and Pavement Markings\).”](#)
6. Position Definitions. For the use of this network, the following definitions for personnel positions or project roles will apply:
  - a. **Project Design Manager.** The Project Design Manager is the individual assigned to oversee the project scoping and manage the project development.
  - b. **Lead Designer.** The Lead Designer is the team leader responsible for the district in which the project is assigned. This individual directs or oversees the work of the subordinate design staff and is also responsible for a proportion of the direct design load.
  - c. **Designer.** The designer is the individual responsible for direct preparation of the specific plan package.



Project Development Process  
(Signing and Pavement Marking Unit)  
Figure 15.1A



## 15.2 ACTIVITIES

### 15.2.1 Activity 412 — Preliminary Signing Study

#### 15.2.1.1 Purpose

The purpose of Activity 412 is to investigate the need for overhead and guide signs and their related impact on potential right-of-way needs. The Signing Unit will provide the Lead Design Group with the information on the potential right-of-way needs for these signs.

#### 15.2.1.2 Tasks

The Signing Unit is responsible for the following tasks:

1. establishing preliminary signing and pavement marking needs, and
2. reporting this information to the Lead Design Group.

#### 15.2.1.3 Preceding/Succeeding Activities

Figure 15.2A illustrates the preceding activities that should occur prior to Activity 412 and the succeeding activities that rely on the results of this activity. For additional guidance, see [Figure 15.1A](#).

Project Type	Preceding Activities	Activity Description	Succeeding Activities	Activity Description
Bridge Replacement Project	550	Preliminary Field Review	212	Preliminary Plan Preparation
Road Design Project	200	Preliminary Field Review	216	Establish Alignment and Grade
Traffic Engineering Project	400	Preliminary Field Review	212	Preliminary Plan Preparation
			404	Preliminary Electrical Plans
			406	Prepare Preliminary Geometrics
Safety Project	900	Define Project	940	Prepare Plan and Profile

### PRECEDING/SUCCEEDING ACTIVITIES (ACTIVITY 412)

Figure 15.2A

## **15.2.2 Activity 414 — Prepare Preliminary Signing and Pavement Marking Plans**

### **15.2.2.1 Purpose**

The lead designer and designer will initiate the preparation of the preliminary design plans. The purpose of this Activity is to prepare the plans in sufficient detail so that the Utilities Section can initiate the utility process. [Chapters Three](#) and [Seventeen](#) present the Department's details on the preparation of signing/pavement marking plans.

### **15.2.2.2 Tasks**

During this Activity the following tasks will occur:

1. The designer or district traffic engineer will conduct an on-site inspection and inventory the existing highway signs and pavement markings within the project limits.
2. The designer will prepare the preliminary signing and pavement marking plans.
3. The lead designer or designer will design the new or replacement signs.
4. The designer will develop the necessary special provisions, signing and pavement marking quantities and will incorporate this information onto quantities plan sheets.

### **15.2.2.3 Preceding/Succeeding Activities**

[Figure 15.2B](#) illustrates the preceding activities that should occur prior to Activity 414 and the succeeding activities that rely on the results of this activity. For additional guidance, see [Figure 15.1A](#).

## **15.2.3 Activity 424 — Check Signing and Pavement Marking Plans**

### **15.2.3.1 Purpose**

The purpose of Activity 424 is review the Signing and Pavement Marking Plans so that they can be incorporated into the project plans and can be reviewed at the Plan-in-Hand Inspection.

Project Type	Preceding Activities	Activity Description	Succeeding Activities	Activity Description
Bridge Replacement Project	576	Approve Bridge Scope of Work	424	Check Signing and Pavement Marking Plans
	656	Formal Public Hearing		
Road Design Project	222	Approve Scope of Work Report	424	PIH Changes Signing and Pavement Markings Plans
Pavement Preservation Project	222	Approve Scope of Work Report	212	Preliminary Plan Preparation
Traffic Engineering Project	417	Approve Scope of Work Report	218	Prepare Plans for Plan-In-Hand
	806	Prepare Preliminary R/W Plans		
	410	Prepare Final Geometrics	424	Check Signing and Pavement Marking Plans
	408	Prepare Final Electrical Plans		
Safety Project	960	Design Preliminary Plans	424	Check Signing and Pavement Marking Plans
	968	Secure Design Approval		
Safety Signing Project	950	Receipt of Partial PE Program	988	Final PIH Inspection

**PRECEDING/SUCCEEDING ACTIVITIES  
(ACTIVITY 414)**

**Figure 15.2B**

### 15.2.3.2 Tasks

The lead designer and/or designer are responsible for checking the quantity sheets, preliminary signing and pavement making plans, and all necessary special provisions.

### 15.2.3.3 Preceding/Succeeding Activities

Figure 15.2C illustrates the preceding activities that should occur prior to Activity 424 and the succeeding activities that rely on the results of this activity. For additional guidance, see Figure 15.1A.

Project Type	Preceding Activities	Activity Description	Succeeding Activities	Activity Description
Bridge Replacement Project	414	Prepare Signing and Pavement Markings Plans	220	Plan-In-Hand Inspection
			572	Bridge Plan-In-Hand Inspection
			623	Attend PIH Meeting and Provide Input
Road Design Project	414	Prepare Signing and Pavement Plans	220	Plan-In-Hand Inspection
			572	Bridge Plan-In-Hand Inspection
			623	Attend PIH Meeting and Provide Input
Traffic Engineering Project	414	Prepare Signing and Pavement Marking Plans	420	Plan-In-Hand Inspection
			623	Attend PIH Meeting and Provide Input
Safety Project	414	Prepare Signing and Pavement Marking Plans	924	Final Construction Limits to R/W
Safety Signing Project	968	Secure Design Approval	988	Final Plan-In-Hand Inspection

**PRECEDING/SUCCEEDING ACTIVITIES  
(ACTIVITY 424)**

**Figure 15.2C**

#### **15.2.4 Activity 426 — PIH Changes Signing and Pavement Marking Plans**

##### **15.2.4.1 Purpose**

The purpose of Activity 426 is to prepare the final signing and pavement marking plans and incorporate the changes and corrections from the Plan-in-Hand review. These plans, along with the special provisions and cost estimate, are sent to Contract Plans Bureau for processing. For guidance on preparing contract documents for processing, see [Chapter Four](#).

### 15.2.4.2 Tasks

The tasks involved in developing the final plans include:

1. making all necessary corrections and changes from the Plan-in-Hand Inspection;
2. finalizing the plans, special provisions and cost estimates; and
3. reviewing the contract documents for accuracy.

### 15.2.4.3 Preceding/Succeeding Activities

Figure 15.2D illustrates the preceding activities that should occur prior to Activity 426 and the succeeding activities that rely on the results of this activity. For additional guidance, see [Figure 15.1A](#).

Project Type	Preceding Activities	Activity Description	Succeeding Activities	Activity Description
Bridge Replacement Project	572	Bridge Plan-In-Hand Inspection	230	Final Plan Review
	220	Plan-In-Hand Inspection		
Road Design Project	572	Bridge Plan-In-Hand Inspection	230	Final Plan Review
	220	Plan-In-Hand Inspection		
Traffic Engineering Project	420	Plan-In-Hand Inspection	423	Final Plan Review
Safety Project	924	Final Construction Limits to R/W	998	Final Plan Review
Safety Signing Project	988	Final Plan-In-Hand Inspection	446	Transmit to Contract Plans – Signing

### PRECEDING/SUCCEEDING ACTIVITIES (ACTIVITY 426)

Figure 15.2D

## 15.2.5 Activity 446 — Transmit to Contract Plans (Signing)

### 15.2.5.1 Purpose

Upon completion of the construction plans, quantities, special provisions and cost estimate, these contract documents are submitted to the Contract Plans Bureau for processing for letting. For guidance on the preparation of contract plans, see [Chapter Three](#) and [Seventeen](#). For guidance on the preparation of quantities, special provisions and cost estimates, see [Chapter Four](#).

### 15.2.5.2 Tasks

The designer transmits a cover memorandum, quantities, special provisions and cost estimate by email to the Contract Plans Bureau.

### 15.2.5.3 Preceding/Succeeding Activities

Figure 15.2E illustrates the preceding activities that should occur prior to Activity 446 and the succeeding activities that rely on the results of this activity. For additional guidance, see [Figure 15.1A](#).

Project Type	Preceding Activities	Activity Description	Succeeding Activities	Activity Description
Bridge Replacement Project	230	Final Plan Review	595	Transmit to Contract Plans
Road Design Project	230	Final Plan Review	245	Transmit to Contract Plans
Traffic Engineering Project	423	Final Plan Review	445	Transmit to Contract Plans – Electrical
Safety Project	240	Check Plans	995	Transmit to Contract Plans
Safety Signing Project	426	Final Signing and Pavement Marking Plans	None	N/A

## PRECEDING/SUCCEEDING ACTIVITIES (ACTIVITY 446)

Figure 15.2E