

**Forest Service Handbook  
National Headquarters - Washington Office  
Washington, DC**

**Forest Service Handbook 7309.11 – Buildings and Related Facilities Handbook  
Chapter 20 - Planning**

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**Superseded Directive:** 7309.11,20, Amendment 7309.11-2004-2, November 22, 2004;  
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**Approved by:** James M. Pena, Associate Deputy Chief, NFS

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**Responsible Staff:**

**Explanation of changes:** Following is an explanation of the changes throughout the directive by section.

**20:** Incorporates the direction previously issued in interim directive (ID) 7309.11-2011-2.

**22:** Sets forth new direction on the certification of Facilities Master Plans.

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This chapter includes direction for facility master planning and the preliminary analysis process for specific projects. See FSM 7311 for related direction for the facility management process.

## **20.2 - Objective**

To ensure that there is adequate planning to protect major capital investments and operation and maintenance outlays for facilities.

## **20.4 - Responsibility**

Regional Foresters, Station Directors, the Area Director, and the Director of the International Institute of Tropical Forestry are responsible for developing multiyear budget plans to meet the needs of the unit.

## **21 - General Planning**

### **21.1 - Planning Considerations**

The exhibits in chapter 10, section 11 illustrates the various considerations involved in facility planning. The facilities master plan guides further planning of those facilities to be acquired. A preliminary project analysis aids in determining the best alternative based on the considerations of location, acquisition method, and cost-effectiveness that best meet management needs.

### **21.2 - Inventory Information**

The facilities information system may store data covering existing and planned improvements, including renovation, modifications, and major maintenance needs. Specific details of this system are in chapter 60.

The inventory may:

1. Provide information for forecasting and establishing capital and maintenance budgets.
2. Serve as a useful tool for facility evaluation and monitoring and for assignment of project priorities.
3. Assist in evaluating major renovation and maintenance against replacement plans.
4. Serve as a continuing record for new management and technical personnel.
5. List proposed new buildings and planned replacements.

Develop the inventory from several sources, such as inspections, records, and site development plans.

## 22 - Facilities Master Plans

Prepare a facilities master plan in conformance with FSM 7312.1 and FSM 1241. The facilities master plan must conform to direction established by the Forest land and resource management plan. The facilities master plan clarifies existing Forest plan direction, and the facilities master plan guides, in a general way, the acquisition, continued use, and disposal of facilities. Refer to Engineering Management (EM) publication EM-7310-4, "Facilities Planning," for detailed instruction on preparing a facilities master plan. Engineering Management publications are available in electronic format and may be retrieved from the Forest Service National Headquarters, Engineering Staff web page on the FSWeb/Intranet, at:

[http://fsweb.wo.fs.fed.us/eng/eng\\_man\\_pubs.htm](http://fsweb.wo.fs.fed.us/eng/eng_man_pubs.htm); or in paper format and may be retrieved by writing to the U.S. Department of Agriculture, Forest Service, 1400 Independence Ave. SW, mail stop 1101, Washington, DC 20090-0003.

The plan should include, but need not be limited to:

1. A Forest/Station-wide review of:
  - a. Current volume of business and projections for the future.
  - b. The best locations for needed skills to perform program work.
  - c. Existing administrative sites and proposed locations for new sites.
  - d. Short- and long-term management strategies concerning unit consolidation and/or sharing services between units.
2. Regional/inter-Regional/national support requirements such as fire management, nursery production, and visitor service activities.
3. A map depicting the name, location, type, mission or purpose, responsibility, and assignment of all facilities.
4. For each site, a tabular listing of all buildings, related structures, and utilities covering size, age, maintenance level, condition, and other pertinent information regarding the site facilities.
5. Recommendations for disposition, that is, a declaration of what is excess to Forest Service needs, what the Forest Service should keep, or what it should acquire, along with reasons for these actions. In the context of section 106 of the National Historic Preservation Act, such declarations are "significant federal undertakings," and thus require evaluation of all potentially historic structures included in the plan.
6. Identification and evaluation of applicable property or buildings of potential historic value. Age of the structure is an indicator of potential historic value, but will not automatically qualify the facility as historically significant. Consider developing disposition recommendations in three steps:

- a. Develop preliminary recommendations.
- b. Determine cultural resource values, as appropriate.
- c. Make final recommendations of disposition after considering appropriate reuse of historic facilities.

If determinations of cultural values have been made, document the results of those determinations.

7. A listing of major existing health and safety hazards, energy retrofit needs, and known maintenance impacts.
8. A listing of all new construction, renovation, refurbishing, and major maintenance projects needed at each site. List projects to be funded by the Facilities Construction Appropriation for Fire, Administrative, and Other (FA&O), Research Construction, and those to be funded by the nonconstruction appropriation sources. Nonconstruction sources are other agency funds and agency collections that would share construction expenses in proportion to the benefiting use, such as Knutson-Vandenberg (KV) funds for tree coolers. List the funding by source, for example: Cooperative Work Forest Service (CWFS); Knutson-Vandenberg (KV); Brush Disposal (BD); and Salvage Sale Funds (SSF). These projects must be shown in the master plan by funding source to establish a basis for collection of these funds. (FSH 6509.11g, ch. 40).

Use the facilities master plan as a tool for organizing, illustrating the opportunities for, and assigning principal facility support activities in the unit. Update the plan periodically to reflect current management objectives and strategies.

Regional offices and research stations are the final level of approval for facilities master plans. The regions and stations shall certify to the Washington Office, Director of Engineering, by September 30 of each year that facilities master plans, scheduled for update during the fiscal year, have been approved.

## **23 - Preliminary Project Analysis**

### **23.1 - General**

The preliminary project analysis provides the review of all viable project alternatives through a screening and analytical evaluation process; it also provides recommendations for further specific project development action. Engineering studies and investigative work must be commensurate with the scope of the proposed project. The scope and depth of each step in the analysis must be sufficient to provide a reasonable comparison among alternatives.

If purchasing or exchanging a facility is chosen in lieu of constructing a facility, review the project development steps shown in chapter 30, section 33. The purpose is to ensure coordinated follow-through is done to provide a facility that best meets current management objectives.

Preliminary inspections necessary for the site or facility evaluation report may require onsite visits. Secure a written agreement to allow access, inspection, and testing as necessary. Normally, the purchase or exchange of property must involve willing parties. Access and reasonable investigation reflect the willing intent of both parties. Preliminary investigation of the viability of the property for Government use does not require the Secretary's approval (FSM 5420).

### **23.2 - Preliminary Project Analysis Process**

Include the following stages in the preliminary project analysis. These stages are further described in "Making Sound Facility Development Decisions," Engineering Management (EM) Publication, EM-7310-2, and "Facilities Planning," EM-7310-4.

1. Clarify project needs stated in the facility master plan.
2. Identify appropriate evaluation criteria.
3. Establish minimum requirements for a feasible alternative.
4. Develop a broad range of alternatives that meet minimum requirements. Re-examine minimum requirements, if appropriate.
5. Gather data about expected performance of alternatives with respect to evaluation criteria.
6. Select the preferred alternative by analyzing tradeoffs.

### **23.3 - Preliminary Project Analysis Elements**

The preliminary project analysis should include the following elements:

1. Draft Prospectus. The draft prospectus serves as the basic statement of project need, objectives to be met, and facility requirements. Use a draft prospectus for the preliminary project analysis. See section 34.21 for guidelines and format for developing the draft prospectus. Because leasing and ownership are evaluated as equally desirable, base space and facility needs on required organization staffing and activity support for an equal period of time, but no less than a 10-year projection.
2. Location Analysis. Location, perhaps more than any other factor, affects the decision of where to develop the facility, the ability to effectively manage programs, and the cost of overall management activities. Because the location of a facility may affect operational patterns on adjacent organizational units, project location analysis may also serve to test and update the facility master plan and examine current thinking in management objectives, operation improvements, and other aspects involving facility support.

There are two distinct steps in the project location analysis. The first step examines specific legislation and Departmental direction that may preempt some location options from further

study. The proposed facility must meet the location requirements of FSM 1220 and FSM 1240. Submit requests for approval of a specific location or relocation to the appropriate line officer only after presenting study recommendations.

The second step involves the selection and analysis of specific sites. When selecting sites or facilities, consider the cost of operation, field travel requirements, proximity to the population served, and other factors, depending on the purpose of the particular facility. In certain facilities the cost of operating from a specific location is the dominant life-cycle cost component for the facility. In these situations ensure that the location analysis is objective and adequate for determining the general optimum transportation cost area.

In addition, request from the General Services Administration a list of available Government-owned facilities or space in the immediate area of need. This is a request of availability only. Available Government-owned space should be considered as an alternative in the preliminary project analysis. If current Government-owned space does not meet needs, document that finding.

3. Alternative Analysis. Review all viable facilities and sites within the general geographic location identified near optimum in the location analysis. Perform an informal preliminary survey to identify suitable potential sites and buildings for lease or purchase. Identify potential construction sites. Ensure that all alternatives under consideration will similarly meet program needs.

Evaluate sites or buildings under consideration to identify potential development, operating, maintenance, and occupancy costs, and list specific conditions or attributes (sec. 23.1). Analyze the life-cycle cost of top candidates, including travel costs (sec. 23.4). See EM-7310-2 for methods of performing a tradeoff analysis.

4. Conceptual Design. A conceptual design includes:
  - a. Desirable features that enhance public contact.
  - b. Optimum contact between functional areas necessary for efficient operation.
  - c. Space requirements determined on a 10-year projection of need.

Use bubble or flow diagrams, conceptual layouts, and identify space requirements to compare alternative sites with existing facilities, and estimate the cost of leasing compared to the cost of new construction.

5. Recommendations. The analysis, supporting documentation, and recommendations serve as a basis for an environmental assessment report. Submit these documents to the appropriate line officer for use in determining the actions needed. Both long- and short-term actions may be required.

## **23.4 - Standards for Economic Analysis**

Using standard economic analysis techniques, analyze the cost-effectiveness of buildings, related facilities, building systems, and equipment. Ordinarily, use total life-cycle costing (present worth) analysis techniques. The Office of Management and Budget (OMB) and legislation established the following regulations governing Government investment analysis.

1. Use OMB Circular No. A-94, revised January 22, 2002, with a current year attachment, for all preliminary project and similar facility investment alternative analyses. Guidance for the use of A-94 for Forest Service facilities evaluations is provided in EM-7310-5, "A Revised Economic Evaluation Policy for Facilities."
  - a. Analyze and display all costs in terms of current dollars, that is, include the effects of inflation.
  - b. The study period should not extend beyond 30 years.
2. For analysis of buildings and subsystem investments directly related to energy conservation, use of renewable energy sources, and similar projects, also use OMB Circular A-94 for the rate.
  - a. Consider all costs in terms of constant dollars, that is, exclude the effects of inflation.
  - b. The study period for all projects should be limited to 25 years.

## **23.5 - Project Planning Considerations**

### **23.51 - Site or Facility Evaluation Report**

The evaluation report provides information about the suitability and adaptability of the site or facility to meet Forest Service needs. It identifies needed improvement, as well as the operation and maintenance costs required to support the proposed activities. The report ensures that the decisionmaker is aware of the scope of long-term cost commitments.

This evaluation should be used to investigate lease or purchase options as well as the viability of reusing existing Forest Service-owned buildings, especially when significant changes in function or occupancy levels are proposed.

### **23.52 - Procedures and Format**

Because of the variety of existing or proposed site possibilities and facility types, a complete listing of items to investigate is impractical. Consider the following procedures and recommended content in determining the scope of investigation and evaluation. Actual investigation should be commensurate with the scope and effect of the facility location, operations, and investment.



1. Ensure that the evaluation team includes members with architectural, electrical, mechanical, civil and environmental engineering, landscape architectural, and other professional skills as appropriate.
2. Review the proposed use of the facility. Consider the following:
  - a. Primary and secondary operations, programs, and uses served.
  - b. Number of employees and visitors served.
  - c. Special program needs for public service, field operations, reforestation, fire suppression, and so forth.
  - d. Physiological and psychological needs of employees and visitors.
  - e. Host program considerations.
3. Conduct a field review by inspecting the property. Carefully evaluate:
  - a. Improvements needed to bring the property to an acceptable level for intended use.
4. Include the following in the Site or Facility Evaluation report format:
  - a. Name of the proposed project.
    - (1) Statement of appropriateness of the property for the intended use over time.
    - (2) Summary estimates of new improvements, renovation, and repair as well as anticipated annual operation and maintenance costs. Highlight primary or special needs.
    - (3) Special features, advantages, and disadvantages of the proposed site.
    - (4) The character of the neighborhood and surrounding environment, present zoning or land-use patterns, and foreseeable changes or trends for the next 20 years.
    - (5) Size, shape, and general usability of the site or building; present or intended occupancy type; and adaptability of the site or building for the proposed use and support activities. Use sketches and measurements of the probable site layout or buildings to determine adequacy of size, usability, or adaptability.
    - (6) An assessment of whether the general quality of the property (site or building) befits the agency and, if required, provides a good public image and service.
    - (7) Availability and adequacy of waste disposal systems, potable water, electrical power, natural gas, fuel oil and propane supplies, security services, and fire protection. Include cost estimates for extending or developing these services and recurring fees for these systems or services.

(8) Site drainage and soil characteristics. Observe and estimate drainage, water table, flood plain, soil permeability, and bearing capacity. Test major sites to determine subsurface conditions and the degree of difficulty or opportunity for locating buried powerlines, grading the site, constructing building foundations, and the likely success of revegetation efforts.

(9) Condition and adequacy of existing buildings for the proposed use. Give consideration to the following items:

- (a) Type of construction and present or designed occupancy type.
- (b) Effectiveness of the proposed or probable functional arrangement of space.
- (c) Adequacy of ingress, external and internal horizontal and vertical circulation, and code-approved fire egress.
- (d) Fire resistivity rating of building components and horizontal and vertical separations.
- (e) Fire detection, alarms, and suppression systems in the building.
- (f) Condition and maintainability of heating, ventilation, air-conditioning (HVAC), and other utility systems.
- (g) Quality and condition of major building envelope components including the foundation, walls, windows, entry ways, and roof.
- (h) Ability to comply with accessibility design requirements.
- (i) Apparent adequacy of structural load-bearing members and design loading of floors.
- (j) Building support services, for example: loading docks and janitorial closets.
- (k) Adequacy of interior and exterior lighting.

### **23.6 - Government-Furnished Quarters - Planning Considerations**

1. General. Seek employee quarters and, in particular, employee family housing in the private sector. When private quarters are inadequate, substandard, or unavailable, the Government may provide quarters for employees or employees and their families. The Government may also require employees to reside at an administrative site to provide public service or protect Government property.

- a. As outlined in FSM 7312.1, analyze the need for Government-furnished quarters of all types.

- b. If the surveys show that rental or purchasable housing and commercial supporting facilities (motels, hotels, restaurants, and boarding houses) are not available to employees, the Government may construct suitable facilities, such as family dwellings, mobile homes, barracks, and cookhouses, on administrative sites. See FSM 7312.2 for additional direction.
  - c. See FSM 6445 and FSH 6409.11 for directions on occupancy of Government-furnished quarters.
- 2. Survey of Availability. In conjunction with the preliminary project analysis, determine the potential supply of alternative support facilities in the private sector. Units shall conduct surveys and canvass needs as follows:
  - a. Conduct surveys for alternatives to Government-furnished quarters as outlined in FSM 6445. Consider local commuting possibilities.
  - b. Document the following on an as-needed basis:
    - (1) Suitable, available housing in and adjacent to the established communities for the last 3 years.
    - (2) Suitable commercial sources for feeding and housing work crews in and adjacent to the established communities for the last 3 years.
    - (3) Suitable buildings and facilities potentially available for purchase or for exchange.
  - c. Prepare site or facility evaluation reports (sec. 23.51) as needed.
- 3. Justification. Justify each project to furnish Government quarters on the basis of need and unavailability of alternatives. Forward justification statements with a budget request.

## **24 - Site Development Plan**

The site development plan, or site plan, depicts the logical and progressive establishment or replacement of improvements, buildings, pedestrian and vehicular circulation ways, and utilities needed for effective use of the site. Physical conditions, opportunities, needs, zoning, and management objectives shape the site plan.

All administrative sites owned by the Forest Service should have a current, approved site development plan. Such plans are mandatory prior to further development. Plans are the graphic description of the present site conditions, improvements, and latest planning proposals for the ultimate development of the site.

The site development plan is used in all three phases of facility management (FSM 7311) and, depending on the specific use, can have various names. Use the site development plan in:

1. Facility planning.

- a. To depict conceptual or existing site zoning. The plan illustrates present and proposed design schemes for effective use of the site.
  - b. To evaluate potential sites during the preliminary project analysis and for special studies.
  - c. To depict existing facilities and utilities and recommended locations to meet current and long-range management plans.
2. Development of individual projects.
- a. To provide a basis for orientation and continuity for individual building siting, grading, and landscaping plans for the project. These plans are larger scale drawings of the project requirements and normally include construction controls for project stakeout. The contract documents include these plans.
  - b. To provide a graphic illustration of the project site and scope of work. Generally, these plans show only existing conditions (topography and improvements) and the work proposed for the project.
3. Facility operation. To provide a record of existing facilities, utility locations, and other improvements for reference, work planning, and emergency response.

## **24.1 - Features**

The site development plan consists of two parts: a site survey plat and development plan. The site survey consists of the basic site information and all existing features. The development plan provides conceptual and specific proposed improvements.

Site development plans should include the following items. As necessary, use several sheets and overlays to separate categories of graphic data. Provide appropriate tabular data.

1. The site survey plat should depict:
  - a. A plot of the site property boundary survey or site traverse with bearings and distances of lines and descriptions of monuments and major internal horizontal and vertical survey or aerial photography controls. As practical, tie the survey to major references such as the General Land Office grid or U.S. Department of the Interior, Geological Survey elevations.
  - b. Major natural and physical features such as topographic, hydrographic, vegetative, and cultural features on the site; adjacent conditions and improvements within 50 to 100 feet of the property that influence the development of the site, such as roads, streets, water mains, sewers, and drainage structures. Provide the depth of water mains and invert elevations of gravity sewer manholes. Show the ownership of utility systems. A contour interval of 2 feet or less is necessary in order to determine the surface drainage patterns.

- c. Legal requirements imposed by local ordinances and zoning requirements, building setback lines, county and city zoning designations (if applicable), and easements conveyed to third parties.
  - d. Climatological data and general site features, such as prevailing winds, roof snow loading and normal peak seasonal ground snow cover, maximum and minimum design temperatures, recorded temperature extremes, seismic zones, rainfall intensity, dominant views, stream flow conditions, and a flood plain description (horizontal and vertical) estimated for a 100-year storm occurrence. Depict appropriate data and features graphically or show them in tabular form.
  - e. Existing site improvements; show ownership if non-Forest Service.
    - (1) Site drainage structures or systems and controlling appurtenances.
    - (2) Utilities, both above and below ground.
      - (a) Power. Show the location of poles, lines, transformers, capacity (in kilovolt amperes) and phase, service drops, and building entrance points.
      - (b) Water. Show the location, size, and type of construction materials, the location of valves and system appurtenances, the average depth of buried lines, the location of building entrances, and hydrants.
      - (c) Wastewater collection. Show the location, size, and type of construction materials of collector sewers and mains, outfall invert elevations of manholes, system appurtenances, lift stations, and treatment plants. Indicate the location of individual building service connections and disposal systems, including septic tank location and size, distribution boxes, and drainfields and cesspools, as applicable.
      - (d) Fuel systems (central oil, gas, or steam systems). Show the location, size, and construction of lines, tanks, drains, valves, appurtenances, and building entrances.
    - (3) Buildings and major structures. Show an outline (footprint) of the first floor or ground exterior lines (major horizontal projections above the first floor) as appropriate: finished first floor elevation of all buildings, inventory identification numbers, and name or use of major buildings.
    - (4) Roads, parking, pedestrian walks, and fences. Show location and finished surface material or type of construction.
    - (5) Other features. Show the location of major signs, loading ramps, corrals, storage yards, helipads, radio antennas, and similar dedicated-use areas.
2. The development plan should depict the conceptual or designed location and "footprint" of all planned roads, buildings, and utilities to show the size and orientation. Include all proposed grading and surface drainage features.

Show planned features, both conceptual and those with completed preliminary designs, in a manner that illustrates the different planning levels. Also show the type, size, and location of utilities and other discrete, controlling features that affect future extensions, future facilities, or the operation or modification of existing facilities.

3. Tabulate data unsuitable for graphic depiction, such as existing and proposed uses of buildings; the gross or net square footage of buildings, date constructed, and other features or remarks, such as buildings on the site either owned or occupied by non-Forest Service personnel; number of floors per building; and major plans, such as for renovation or demolition.

List the above data on the site plan or attach computer printouts.

Regions and Stations should develop graphic standards and development procedures and processes as needed for uniformity of site development plans, site landscape plans, building site, grading, and landscape plans, and other similar documents.

## **24.2 - Maintenance**

Regions and Stations should establish criteria for maintaining current, approved site development plans.

1. Maintain site development plans to ensure that information on the site survey and development plans is current.
2. Adjust features after completing major studies or planning efforts and construction. Periodically review the plans to ensure that the existing and proposed features meet long-term management objectives.
3. Consider using orthophotographs or digital photographic methods (computer aided drafting) for major periodic revisions of large complexes.
4. Separate sheets and overlays with various types of existing or planned facilities to aid the maintenance of the site development plan. Consider colored overlays to facilitate photographic transfer of data for developing composite or project plans.
5. Generally, review and revise site plans as needed. Consider changes in organizational boundaries or management needs when evaluating the appropriateness of the existing site plan. Review and make revisions before beginning a major construction project.

Use the site development plan as a source document for unscheduled reviews of space, land utilization, or requests for capital investment or reinvestment projections.