

# Chapter 9

## UTILITIES

### *Introduction*

For this discussion, utilities include all public or private service lines or equipment and railroads. Highways and utilities share the common purpose of public service and in many cases they share the same corridor. Utilities can be a controlling factor in the design of an infrastructure project, and, therefore, are an important consideration.

Utilities transport or deliver power, communications, gas or liquids, and rail (freight and passengers). Their size or load varies for long-distance transmission lines (service connections between Urban/Metropolitan areas) and shorter-distance distribution lines (locally controlled customer service). These facilities can also include substations, pumping stations, metering stations, siphons, and other appurtenances. It is usually much easier to deal with the rearrangement of a distribution facility than a transmission facility due to cost factors, massive structures affected, and potential for widespread service interruptions. The designer should consult with the Utilities Engineer/Coordinator and be aware of the differences early in project development. Long distance transmission lines are usually located within utility-owned easements, while shorter distance distribution facilities usually share highway rights-of-way or private property in densely developed locations with few options for rearrangement.

The procedures for administering utility matters are outlined in the *Utility Accommodation Manual* [UAM (1)] published by the New Hampshire Department of Transportation (NHDOT). This guide applies to alterations, construction, and licensing of public or private utilities on any highway under the jurisdiction of the NHDOT Commissioner. The UAM (1) also applies to compact areas wherein local governments may grant the NHDOT temporary jurisdiction through agreement.

The UAM (1) designates appropriate responsibility, minimum standards, reimbursement regulations, and licensing procedures for new or adjusted utilities. Utility work performed outside the timeframe of a State construction contract requires the utility to coordinate with, and obtain a permit from the Bureau of Highway Maintenance and/or Turnpikes. Relocated utility poles generally require a new pole license from the Bureau of Highway Maintenance and/or Turnpikes.

This chapter will provide the designer with an overview of the utility coordination process. The UAM (1) describes the working procedures and details in accordance with the requirements of State Statute and Federal-aid regulations/laws. Title 23 Code of Federal Regulations (CFR) 645 – Utilities and 646 – Railroads (2) prescribes the policies, procedures, and reimbursement provisions for the adjustment, relocation, and accommodation of utility facilities on Federal-aid and direct Federal projects and the policies, and procedures for advancing Federal-aid projects involving railroad facilities.

## **General**

Almost all projects will have utility facilities located within the project limits. Utility adjustments may not be necessary, but it is still necessary to show the utility on the plans and notify the utility owner of proposed work even if no adjustment is anticipated. Early coordination is crucial between the utility, the project designers, the Bureau of Construction, the Bureau of Right-of-Way, and Design Services - Utilities Section. The Utility Coordinator, in coordination with the project designers, will evaluate utility impacts and identify the extent of the work needed by the NHDOT or the utility. It is preferred to avoid impacts to utilities if possible.

## **Jurisdiction**

Utility ownership varies with purpose and jurisdiction. Major utility companies extend across state lines, but they must comply with the regulations of the local jurisdiction. Utilities may also be wholly owned and administered by a municipality. Control of public utilities is exercised by the Public Utilities Commission (PUC) of the State of New Hampshire, exceptions being municipally-owned utilities within municipal boundaries or urban compacts, in accordance with RSA 362:4 and RSA 362:4-a, cable television facilities, and some minor privately owned utility facilities.

The PUC regulates activities of utilities defined in RSA 362:2. Pursuant to RSA 363:17-a, the PUC acts as the arbitrator between the interests of the customer and the interests of the regulated utility.

A utility that occupies State Rights-of-Way does so under sufferance with the expressed or implied permission of the State. Instances of prior ownership sometimes arise, but such conditions are rare. Locations of facilities within the State's Rights-of-Way are subject to Department approval, which provides the utility with assurance that its plan complies with highway standards. Information about programmed highway projects that may impact existing utilities and/or affect new utility work is provided by the NHDOT.

## **Reimbursement**

Typically, the utility will be responsible for the costs of the relocation of their facilities. There are circumstances where the utility is eligible for reimbursement of relocation costs under State Statute and/or Federal-aid regulations/laws. The primary basis for the determination is for the first party to have a compensable interest in the area of concern, or to be the party that has the prior or senior right. If the utility has prior rights, it is eligible for compensation. Each case must also be evaluated to determine if either party has ever sold or relinquished their rights by some other means. Some companies have voluntarily relinquished easement rights and relocated their facilities out of their easements and into a highway Right-of-Way. In such cases, the NHDOT is not liable for any subsequent relocation costs. Where the circumstances are not clear regarding the eligibility for reimbursement of relocation costs, it may be necessary to seek evaluation and a legal opinion from the State's Attorney General's Office.

Preliminary engineering, construction engineering and inspection for facilities eligible for the full reimbursement of relocation costs are also reimbursable.

- A. Typically, reimbursement for relocations is allowed under the following situations:
1. The facility occupies private property by rights granted to the owner of the utility by an easement; or the utility owns the property.
  2. The facility occupies a highway Right-of-Way where the utility had the right of easement prior to the acquisition of the Right-of-Way by the State or Municipality or prior to 1905 when the Department was incorporated, and the utility has not been compensated for easement rights.
  3. The facility occupies a highway Right-of-Way and the right of easement was reserved to the utility in the highway return of layout.
  4. A municipally-owned utility is located within the Right-of-Way of a street or road owned by the municipality, provided that the utility is not required by law to relocate its facilities at its own expense.
  5. The Attorney General's Office issues an opinion obligating the State to bear any or all costs of relocation.
  6. The facility is located on US Government land such as Forest Service with a permit or lease. The Federal agency may participate - see - Title 23 CFR 660.
  7. A utility other than power, telephone, railroad, or cable television claims rights by adverse possession (or prescriptive right) (this requires Attorney General's opinion).
  8. Municipally-owned subterranean (underground) utility facilities that are required to be relocated on a project funded in whole or in part by state funds are eligible for partial reimbursement in accordance with RSA 228:22 (trenching and backfilling cost of relocated facility, and book value (original cost less allowable depreciation) of the retired facility). This applies to locations where a municipal utility does not qualify for full reimbursement under items 1 or 4 above. Note: Hydrants are not considered an underground facility; however plumbing to a hydrant can be included in the book value. If any portion of a service line is owned by the municipal utility, that portion would be eligible for participation by the State.
  9. The structural framing for support of utility facilities on the construction and reconstruction of bridges are project costs (maximum spacing as required by the utility for their facility, with final spacing to be determined by the Department as appropriate for the particular bridge). Specifically, intermediate K-frames, holes through K-frames for hangers and rollers, blockouts through bridge backwalls, sleeves through the backwall and over or under approach slabs (and extending 5' beyond), and reinforcing steel modification for blockouts and sleeves through backwalls are included.
- B. Generally, other situations are not eligible for reimbursement and the utility will be responsible for costs of the relocations of their facilities if:
1. The facility, other than municipally-owned, is located in the highway Right-of-Way with or without permit or license.
  2. Power, telephone, communications or cable television facilities are located on private property without easement or ownership of property.

3. A municipally owned above ground utility is located in the State owned Right-of-Way without:
  - a) An easement, or
  - b) Reservation of easement in return of layout.
4. A utility facility is located on private property with a lease or rental agreement and the property is acquired for highway Right-of-Way (some cases may require the opinion of the Attorney General).
5. The Attorney General's Office issues an opinion obligating the utility to bear all costs.
6. Conduits and/or pipe lines on bridges and supplemental supports, including supporting mechanisms, such as hangers, rollers, alignment guides, and inserts, are attached to structural framing of bridges, or within Department supplied sleeves (except as noted in part A-9 above). Also the access facilities (cat walks, ladders or special ramps) for conduits and/or utilities on bridges and all Preliminary and Construction Engineering. All designs are to be coordinated with the Department.
7. Inspection of all service connections where they are not impacted by the Department's required construction.

## ***Responsibility***

### **Utility**

The utility has the responsibility for complying with local, State and Federal laws and regulations of the USDOT (FHWA), PUC, the State, the NHDOT, and associations that sponsor national safety codes.

Applicable codes or standards recognized by the State include, but are not limited to, the following:

- National Electrical Safety Code;
- American Water Works Association Standards and Specifications;
- ANSI Standard Code for Pressure Piping of the American National Standards Institute:
  - + ANSI B 31.1, Power Piping;
  - + ANSI B 31.3, Petroleum Refinery Piping;
  - + ANSI B 31.4, Liquid Petroleum Transportation Piping Systems;
  - + ANSI B 31.8, Gas Transmission and Distribution Piping Systems;
- Recommended Practice for Liquid Petroleum Pipelines Crossing Railroads and Highways by the American Petroleum Institute;

- Natural Gas Pipeline Safety Act of 1968 as amended; and,
- Title 23 (CFR) Part 645 for Utilities and Part 646 for Railroads (2), and Title 49 (CFR) as amended.

The utility is obligated to provide plans, estimates, reviews, field locations, and liaison personnel to work with the Design Services - Utilities Section of the Bureau of Highway Design as noted in the Procedure Section, below.

### **Design Coordination**

The Design Services - Utilities Section staff, or designated consultant, provides the coordination between the utility companies and designers within Project Development (including the Bureaus of Highway Design, Bridge Design, Rail & Transit, and Aeronautics), Operations (including Highway Maintenance, Bridge Maintenance, Traffic, and Transportation Systems Management and Operations), Turnpikes, and the Department of Administrative Services (Bureau of Public Works) which may deal with utility issues.

The Design Services - Utilities Section maintains contact with affected utility companies. Information transfer, conferences, or other meetings should not be arranged without the presence or advice of one of the Utilities Engineers. The Design Services - Utilities Section is responsible for the following activities:

- Obtaining utility information as needed;
- Coordinating utility issues on infrastructure projects including all contacts with utility owners, railroads, and other involved government agencies and the project design team;
- Designing temporary and permanent lighting;
- Reviewing utility and railroad adjustment and/or relocation arrangements;
- Determining liability for adjustment and/or relocation costs;
- Preparing and/or reviewing estimates related to utilities or railroads;
- Preparing Force Account agreements;
- Preparing Use and Occupancy agreements;
- Processing reimbursement invoices;
- Construction coordination; and,
- Modernization, reconstruction, or elimination of railroad at-grade crossings, bridges, sidings, corridors and signals.

The designer is responsible for furnishing plans and project information to the Design Services - Utilities Section for coordination purposes as soon as plans are available. The scheduling guidelines and flow diagram in the appendices of this chapter show the coordination work necessary to properly process utility verifications, adjustments and relocations. Considerable lead-time is usually required to coordinate utility relocations, particularly when force account agreements are necessary (see the “Procedure” section

below). The flow diagrams in Chapter 2, Project Development, show the integration of utility coordination into the project development process.

### **Bureau of Construction**

Bureau of Construction involvement begins early in the project development utility and railroad coordination process, becoming the total responsibility of the Bureau of Construction at the preconstruction conference where the Contractor, the Contract Administrator, utilities, and/or railroad representatives, and Utility Coordinators meet with the District Construction Engineer to review project requirements and schedules of operation. In addition to construction inspections, the Construction Contract Administrator monitors utility force account work and receives periodic utility reports from the utility if the work is reimbursable.

### **Bureau of Right-of-Way**

The relocation of utility facilities that exist on private property are reimbursed in accordance with Right-of-Way Relocation requirements. The Bureau of Right-of-Way is responsible for the relocation negotiation. The Utilities Section will assist in the coordination and will review cost estimates and agreements, as requested.

See Chapter 10 – Right-Of-Way, for additional information.

## ***Procedure***

### **Highway Projects**

The flow diagram (Appendix 9-1) shows the related activities required for utility coordination.

When the scope of work for a project has been defined (with or without conceptual design), the Designer must meet with the Utilities Engineer/Coordinator to discuss the utility concerns and determine the number of sets of plans needed to begin the coordination process.

As the project develops, all known utilities must be shown on the plans and cross-sections. Refer to the UAM (1) and to Volume 2 of this Manual for the preferred symbols and plan format.

As projects progress, it is the responsibility of the Design Team or the Consultant Design Reviewer to keep the Design Services - Utilities Section informed of progress. It is the responsibility of the Utilities Engineer, through the Utility Coordinator, to keep the Designer informed of utility involvement. When all existing utilities have been shown on the plans and cross sections, along with other design features such as drainage, pavement structure (top and bottom template), structure base courses, etc., the information should be reviewed with the Design Services - Utilities Section to determine conflicts and their potential resolutions. Changes from the original concepts should also be reviewed with the Design Services - Utilities Section.

The Designer, together with the Utility Coordinator, prepares the list of unresolved conflicts between the individual utility and the proposed design as shown on the approved Slope & Drain plans. Relocation request documents consisting of a letter describing the potential conflicts and reimbursement (if applicable) with a specific return date, and approved Slope &

Drain plans and cross-sections with conflicts highlighted, are sent to individual utilities. Relocation plans are reviewed for conflict resolution in accordance with State policies in the UAM (1) and, when approved, are forwarded to the Designer for incorporation into the project documents.

The project area will be reviewed for both permanent and temporary lighting needs and necessary lighting designed after receipt of approved aerial relocation plans, any signal designs, and traffic control plans. See “Lighting” below for more details.

A Utility Agreement is required between the State and utilities affected by the proposed project that either receive or provide reimbursement for utility relocations or improvements. Each agreement describes the scope of the work involved, special handling required, and the method and extent of reimbursement for work performed (usually on a force account basis). On all projects, copies of executed Utility Agreements are provided to the Design Team or Consultant Design Reviewer, Bureau of Construction and Bureau of Finance & Contracts and attached to the project in the Department’s Project Management Information System. Funding must be authorized by FHWA before the utility is authorized to perform work. On FHWA Oversight projects (see NHDOT and USDOT-FHWA Stewardship Agreement), all utility agreements must be reviewed, and approved before funding will be authorized by FHWA.

The utility relocation work to be performed by the State’s Contractor shall be shown on the design plans. In instances where the utility/municipality hires a separate engineering firm to complete the design of the relocated/new facility, the proposed utility work is shown on the project construction plans with separate utility construction plans and details attached to the back of the project plan set, after the cross-sections.

A Use and Occupancy Agreement, or Amendment to a Use and Occupancy Agreement, may be required for utility relocations within the Limited Access Right-of-Way and Controlled Access Right-of-Way with freeway characteristics. Longitudinal facilities within the Limited Access Right-of-Way are not allowed unless an exception is granted by the Commissioner.

On all projects, a Utility & Railroad Certificate is provided to the Design Team or Consultant Design Reviewer as an attachment to the Department’s Project Management Information System. The Utility & Railroad Certificate lists all companies affected, whether the required work is to be reimbursable to the companies involved or not, and notes that all utility work will be coordinated with the physical construction of the project or it indicates no utility/railroad impacts are anticipated. On FHWA Oversight projects (see NHDOT and USDOT-FHWA Stewardship Agreement), the Utility & Railroad Certificate together with copies of the design plans, proposals, estimates, and required permits, is transmitted to FHWA at least two (2) weeks prior to the advertising of a project, for review, and documentation.

### **Lighting**

The lighting design for a highway facility, either permanent or temporary, is the responsibility of the Design Services - Utilities Section with some standardized temporary lighting layouts. Lighting is designed in accordance with the *Roadway Lighting Design Guide* (3), and *Roadway Lighting Handbook* (4), and the *NHDOT Highway Lighting Design Manual* (5).

### Permanent

Lighting installations are typically included with the highway contract, but in some cases there may be individual lighting projects. They may be built by contract, by utility forces, or in some instances by State forces. Municipalities may request individual lighting and/or have their lighting incorporated into the highway contract. In both cases all operating charges are the responsibility of the municipality. For individual lighting projects, associated materials and installation costs are the responsibility of the Municipality. For lighting projects incorporated into a highway contract, the Design Services - Utilities Section reviews the request containing plans, traffic volumes and accident histories and determines if the highway facility warrants lighting. If so, the State will participate in the lighting system up to the cost value of the NHDOT's standard highway lighting specifications except if a municipal lighting policy is in effect. Special lighting (ornamental) costs beyond that value, or costs for lighting that is not warranted, are borne by the Municipality. In most cases, for standard highway lighting, ownership and maintenance of the lighting system is turned over to the area's franchised power company with the operating costs paid by the State. For ornamental lighting, that responsibility and cost is borne by the Municipality and in some cases, the NHDOT's Highway Maintenance District or Turnpikes.

### Temporary

Temporary lighting is designed or reviewed by the Design Services - Utilities Section on all highway projects to assist the motorists in safely navigating through the construction area. The design of temporary lighting is determined by the Traffic Control Plans (maintenance of traffic during construction) and construction phasing sequence considering alignment changes, lane widths, hazardous obstacles near the traveled ways and traffic volumes. The installation, maintenance, and removal of temporary lighting is included in the contract.

### **State Force Account Projects**

Utility companies involved in projects constructed by State forces coordinate their work with the Highway Maintenance District Engineer or Turnpikes. The same laws and regulations apply to the procedure except that the highway work is performed by State forces and not by a contractor.

### **Railway-Highway Grade Crossing Projects**

The Federally sponsored Railway-Highway Grade Crossing Program enables safety improvements to at-grade crossings. The State has an inventory of at-grade crossing locations listed by priority ranking as an aid to the selection of Federal-Aid projects. The priority ranking is established by combining information from the evaluation of field conditions, which includes drainage, rail and roadway surface conditions, sight distance, track geometry, roadway alignment, and ride quality with vehicle volumes, train frequency, and input from railroads, municipalities, State maintenance forces, police accident reports, and the public.

All Railway-Highway at-grade-crossing safety improvements are coordinated by the Railroad Coordinator.



Railway-highway sight distance problems are discussed in Chapters 3 and 4. In New Hampshire, it is frequently difficult to assure an adequate sight distance triangle, therefore the designer usually relies upon traffic control devices to provide adequate safety.

Railway-highway at-grade crossing projects require the same plan development process and utility coordination efforts as the more common highway projects. Railroads prefer to have the road closed to traffic when at-grade crossings are reconstructed. This preference should be considered in the development of the Traffic Control Plan (TCP).

### **Railway Grade Separation**

A grade separation is the safest method of accommodating both highway and railroad traffic movements. It is also the most expensive. Justification is based on warrants that take into account the traffic volumes, accident history, potential hazard of the location, and other factors. Arrangements for grade separations sometimes require an adjudicatory hearing to resolve issues between the NHDOT and the railroad. See Chapter 3 for vertical clearance to be maintained for grade separations.

### **Utility or Railroad Force Account Projects**

These are projects where all construction is performed or contracted by the utility or railroad.

A Force Account Agreement is a contract between the State and a utility or railroad for the utility or railroad to perform work using its own forces or its contractor's forces. The agreement describes the scope of the work involved, special handling required, and method and extent of reimbursement for the work performed.

## ***Location and Design***

Utility and railroad facilities are usually located and designed by the owners, subject to approval by the State and FHWA if they affect highway operations. Highway lighting and parking area lighting for State projects are usually designed by the Design Services - Utilities Section, coordinating with others in the NHDOT.

The UAM (1) Sections IV through IX are the criteria to use in checking existing or proposed locations for compliance with the State requirements for utilities within the Right-of-Way.

In addition to the material contained in the UAM (1), the following are useful designer references:

- *Title 23 (CFR) Part 645 - Utilities and Part 646 - Railroads (2),*
- *Roadway Lighting Design Guide (3),*
- *Roadway Lighting Handbook (4),*
- *NHDOT Highway Lighting Design Manual (5),*
- *Highway / Utility Guide (6),*
- *Manual on Uniform Traffic Control Devices (MUTCD) (8),*
- *Railroad-Highway Grade Crossing Handbook (9), and*

- Order 5060.1, FHWA Policy on Agency Force Account Use (10).

### **Subsurface Utility Engineering (SUE)**

Design Services – Utilities Section administers a Subsurface Utility Engineering (SUE) program consistent with the “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data” (7) intended to manage the risks associated with the reliability of information on existing subsurface utility facilities on active Department projects. NHDOT’s SUE Program employs established procedures and engineering technologies to provide information as to the accuracy (quality) of the horizontal and vertical locations of existing underground utility infrastructure. The implementation of SUE may be appropriate for certain Department projects where enhanced location information of existing subsurface utility facilities are determined to be essential for the design and construction of road improvement and widening projects.

The following Quality Levels for existing utility information can be found on Department project utility plans where SUE (see, Appendix 9-1, Utility/Railroad Coordination Process Flow Diagram for the phase to implement specific investigations) has been employed:

- a. Quality Level “D” (Records Research) Information – Information derived through existing records or oral recollections. This also includes an in-field visual site inspection to verify credibility of such records. Quality Level “D” is typically applied when it is necessary for the designer to make broad decisions about route selection, purchasing right-of-way, or producing/requesting a higher level of data. This level of information is typically recommended during a project’s concept development phase.
- b. Quality Level “C” (Survey) Information – Information obtained to indicate the presence of approximate horizontal location of underground utilities by surveying visible above-ground utility features, such as manholes, valve boxes, posts, etc., and by using professional judgment, correlating this information with existing utility records (Quality Level “D”). Quality Level “C” is typically used on rural projects and is recommended when preliminary design begins and project mapping and survey control have been established.
- c. Quality Level “B” (Designating) Information – Information obtained to indicate the presence and approximate horizontal location of underground utilities using geophysical prospecting techniques, including electromagnetic, magnetic, sonic, or other energy fields. The data obtained from these methods should be reproducible by surface geophysics at any point of their depiction. This level of information is used by the designer to make educated decisions on where to place storm drainage systems, footings or foundations to avoid conflicts with existing utility facilities. Quality Level “B” is typically used on urban type projects and is recommended when preliminary design begins and project mapping and survey control have been established.
- d. Quality Level “A” (Locating) Information – Information to obtain the precise horizontal and vertical position of the utility line by excavating a test hole. The test holes shall be done using vacuum excavation or comparable nondestructive equipment in a manner as to cause no damage to the utility line. This level of information provides three-dimensional mapping of specific conflict areas needed for final design and utility placement decisions that could result in significant cost

savings for the project. Quality Level “A” is recommended after the Preliminary Field Plan Review, ideally following a Utility Impact Analysis.

## ***Traffic Control***

Public safety is a primary consideration in all highway operations. The utility companies and railroads are just as responsible for safe maintenance of traffic through their work areas, as roadway contractors are for maintenance of traffic through their work areas.

Projects designed by the Design Services - Utilities Section, or designated consultant, will include a TCP developed by the Utilities Engineer and coordinated with the Chief of Final or Consultant Design.

## References:

1. New Hampshire Department of Transportation (NHDOT), *Utility Accommodation Manual*, NHDOT, 7 Hazen Drive, Concord, NH, February 2010;
2. U.S. Government Printing Office, *Code of Federal Regulations (CFR) Title 23, Highways, Part 645 - Utilities and Part 646 – Railroads*, Washington, DC, (Latest Edition).
3. American Association of State Highway and Transportation Officials (AASHTO), *Roadway Lighting Design Guide*, AASHTO, 444 North Capitol Street, NW, Suite 249, Washington, DC, October 2005;
4. Federal Highway Administration (FHWA), *Roadway Lighting Handbook*, FHWA, Washington, DC, August 2012;
5. New Hampshire Department of Transportation (NHDOT), *Highway Lighting Design Manual*, NHDOT, 7 Hazen Drive, Concord, NH, December 2010;
6. Federal Highway Administration (FHWA), *Highway / Utility Guide*, FHWA, Washington, DC, June 1993;
7. American Society of Civil Engineers (ASCE), *Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data*, ASCE, Reston, VA
8. Federal Highway Administration (FHWA), *Manual on Uniform Traffic Control Devices (MUTCD)*, FHWA, Washington, DC, May 2012;
9. Federal Highway Administration (FHWA), *Railroad-Highway Grade Crossing Handbook*, FHWA, Washington, DC, August 2007; and
10. Federal Highway Administration (FHWA), *Order 5060.1, FHWA Policy on Agency Force Account Use* FHWA, Washington, D.C., March 2012,

## APPENDICES

- 9-1 Utility (Including Railroad) Coordination Process Flow Diagram
- 9-2 Utility Coordination Process (Scheduling Guidelines)
- 9-3 Force Account Agreement Process Flow Diagram
- 9-4 Utility Request (Includes Lighting Design Request)
- 9-5 Utility & Railroad Certificate (template)