National Cooperative Highway Research Program

NCHRP Synthesis 224

Longitudinal Occupancy of Controlled Access Right-of-Way by Utilities

A Synthesis of Highway Practice

Transportation Research Board
National Research Council

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National Cooperative Highway Research Program

Synthesis of Highway Practice 224

Longitudinal Occupancy of Controlled Access Right-of-Way by Utilities

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Research Council was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communication and cooperation with federal, state, and local governmental agencies, universities, and industry; its relationship to the National Research Council is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the National Research Council and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Research Council and the Transportation Research Board.

The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.

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The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, the American Association of State Highway and Transportation Officials, or the Federal Highway Administration of the U.S. Department of Transportation.

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PREFACE

A vast storehouse of information exists on nearly every subject of concern to highway administrators and engineers. Much of this information has resulted from both research and the successful application of solutions to the problems faced by practitioners in their daily work. Because previously there has been no systematic means for compiling such useful information and making it available to the entire community, the American Association of State Highway and Transportation Officials has, through the mechanism of the National Cooperative Highway Research Program, authorized the Transportation Research Board to undertake a continuing project to search out and synthesize useful knowledge from all available sources and to prepare documented reports on current practices in the subject areas of concern.

This synthesis series reports on various practices, making specific recommendations where appropriate but without the detailed directions usually found in handbooks or design manuals. Nonetheless, these documents can serve similar purposes, for each is a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems. The extent to which these reports are useful will be tempered by the user's knowledge and experience in the particular problem area.

FOREWORD

By Staff
Transportation
Research Board

This synthesis will be of interest to highway administrators, design engineers, maintenance engineers and maintenance staff, traffic engineers, and safety officials. It will also provide useful information to the utilities and telecommunications industries. Information is presented on the state transportation agencies' policies, practices, and experience associated with occupancy of the rights-of-way on controlled- (or limited-) access highways.

Administrators, engineers, and researchers are continually faced with highway problems on which much information exists, either in the form of reports or in terms of undocumented experience and practice. Unfortunately, this information often is scattered and unevaluated and, as a consequence, in seeking solutions, full information on what has been learned about a problem frequently is not assembled. Costly research findings may go unused, valuable experience may be overlooked, and full consideration may not be given to available practices for solving or alleviating the problem. In an effort to correct this situation, a continuing NCHRP project, carried out by the Transportation Research Board as the research agency, has the objective of reporting on common highway problems and synthesizing available information. The synthesis reports from this endeavor constitute an NCHRP publication series in which various forms of relevant information are assembled into single, concise documents pertaining to specific highway problems or sets of closely related problems.

This report of the Transportation Research Board presents a brief history of accommodation of utilities in the right-of-way, including the policies developed over time by the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA) and describes why there are issues associated with joint use of the highway right-of-way. In connection with the Synthesis, a survey of the state transportation agencies, conducted in 1993/1994 yielded 100 percent return, indicating the high interest in the subject. Among the issues included in the survey

were policies and experiences regarding user and worker safety; controls placed on utilities; exceptions to right-of-way policies; and operational, legal, and equity issues. The findings represent the situation at the time of the survey with some minor updates; in some instances the policy or practice may have changed. This is reflected in the policy resolution adopted in 1995 by AASHTO recognizing the potential occupancy of fiber optics in the right-of-way. As this Synthesis was going to press the Telecommunications Act of 1996 (P.L. 104–104) was signed on February 6. The Act provides for "comparatively neutral and nondiscriminatory" access to rights-of-way by telecommunications carriers, and for "fair and reasonable compensation" from telecommunications providers. The details and impacts of this legislation will be developed later and are not addressed in this publication.

To develop this synthesis in a comprehensive manner and to ensure inclusion of significant knowledge, the Board analyzed available information assembled from numerous sources, including a large number of state highway and transportation departments. A topic panel of experts in the subject area was established to guide the researcher in organizing and evaluating the collected data, and to review the final synthesis report.

This synthesis is an immediately useful document that records practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As the processes of advancement continue, new knowledge can be expected to be added to that now at hand.

CONTENTS

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Ronald L. Williams, P.E., SR/WA, Registered Professional Engineer and Surveyor, Charleston, West Virginia, was responsible for collection of the data and preparation of the report.

Valuable assistance in the preparation of this synthesis was provided by the Topic Panel, consisting of Charles N. Blatt, Manager, Utilities Branch, State of Oklahoma Department of Transportation (retired); Robert D. Carlson, Main Office Utilities Engineer, New York State Department of Transportation; Dennis M. LaBelle, Facilities Relocation Coordinator, Florida Power and Light Company; Robert W. Linebaugh, Chief Utility Relocation Administrator, Pennsylvania Department of Transportation; Gerry Meis, Chief, Office of Permits, California Department of Transportation; Paul Scott, Highway/Utility Engineer, Federal Highway Administration; Brent Snowden, Utility and Railroad Engineer, Maine Department of Transportation; and Daniel S. Turner, Head of Civil Engineering, University of Alabama.

The Principal Investigators responsible for the conduct of this synthesis were Sally D. Liff, Manager, Synthesis Studies, and Stephen F. Maher, Senior Program Officer. This synthesis was edited by Linda S. Mason, assisted by Rebecca B. Heaton.

Scott A. Sabol, Senior Program Officer, National Cooperative Highway Research Program, assisted the NCHRP 20-5 staff and the Topic Panel.

Information on current practice was provided by many highway and transportation agencies. Their cooperation and assistance were most helpful.

LONGITUDINAL OCCUPANCY OF CONTROLLED ACCESS RIGHT-OF-WAY BY UTILITIES

SUMMARY

The placement of utility facilities on highway right-of-way has been a common practice since the inception of the highway system. The joint use of right-of-way for highways and utilities was a natural evolution as an efficient use of the land.

The advent of the National System of Interstate and Defense Highways in the mid 1950s brought about the control of access to right-of-way as a significant feature contributing to the safety and capacity of the highway system. In 1959, federal regulations were issued that essentially prohibited new utility installations within the controlled access right-of-way on Interstate highways, unless special circumstances merited an extreme case exception. Until 1988, the Federal Highway Administration (FHWA) was the final decision-making agency on granting an extreme case exception.

On February 2, 1988, FHWA reversed its long-standing policy of prohibiting placement of utility facilities longitudinally within controlled access freeway right-of-way. The decision whether or not to permit such occupancy was turned over to each individual state.

A survey was conducted for this synthesis in 1993/1994 to determine which states now allow longitudinal occupancy of controlled access right-of-way by utilities; the type of utility permitted; and the policies, practices, and experience associated with such occupancy. The survey was sent to highway agencies in the 50 states and the District of Columbia. Interest in this subject was demonstrated by the return of all questionnaires. It should be noted that no questionnaires were sent to utility industry representatives; therefore, the results reported represent only the perspective of the state highway agencies.

This synthesis reviews the history of utility accommodation policy revisions that have affected utilities from 1916 until the present. It also discusses advantages and disadvantages to longitudinal occupancy of freeway right-of-way by utilities. Advantages include the following: freeways offer the most direct route between major population centers, promising utility cost savings and societal benefits; less total right-of-way is required; and a generally unobstructed area is available in which to build and maintain the facility. However, many states see disadvantages in such use of right-of-way when it is in conflict with the use, safety, and capacity of the freeway, and when the use causes extra expense during maintenance and additional highway construction.

This synthesis also discusses terminology used in the industry, including utility accommodation policies, right-of-way, controlled access, limited access, and longitudinal occupancy. Special circumstances, exceptions, hardship cases, legal issues, operational impacts, and other matters are summarized based on survey responses.

Six states were selected for in-depth case studies based on specific experience relative to the issues studied for this synthesis. These six states reported special circumstances or situations in their survey responses with regard to longitudinal occupancy of controlled access right-of-way by utilities.

Based on the results of this study, it appears that the states have taken a slow approach to permitting longitudinal occupancy of freeway right-of-way by utilities. Only a few states allow any utilities, mainly fiber optic systems, to be installed.

The real issue seems to be whether to allow this use by any utility, not just fiber optics. Most states indicated that if one type of utility is allowed, then it becomes very difficult to limit or exclude other types or competing companies with similar facilities. Permitting one type of utility to occupy while denying others at first appears discriminatory, although there may be some rationale for such discrimination. Fiber optic systems can be directly buried near the outer edge of the controlled access right-of-way with essentially no maintenance required unless the facility is damaged. There is no potential for after-installation problems, such as threat of explosion or damage to the highway facility, as there may be with petroleum, natural gas, or water.

Overall, based on responses to the survey, most states indicated that they are inclined to maintain freeway rights-of-way that are void of longitudinal utility occupancy.

The most recent activity on this matter has been an October 1995 Policy Resolution, by the Board of Directors of the American Association of State Highway and Transportation Officials (AASHTO). This resolution acknowledged the distinction between buried fiber optic cables and other types of utilities, and deemed it permissible, under appropriate guidelines, to permit fiber optics to longitudinally occupy freeway rights-of-way, while retaining existing policy in opposition to such use by other utility types.

CHAPTER ONE

INTRODUCTION

The issue of making freeway right-of-way available for longitudinal occupancy by utilities has been the subject of many heated discussions and debates ever since controlled access right-of-way lines have been placed on freeways. Longitudinal occupancy is the placing of utility facilities inside the controlled access (in some states referred to as *limited access*) right-of-way of a freeway with the utility running generally parallel to, as opposed to crossing, the freeway. To the utilities industry, such use of the freeway right-of-way appears to offer cost savings in construction and maintenance, which may be reflected in lower rates to its customers. However, to the states, such use may be in conflict with the use, safety, and capacity of the freeway facility.

A freeway is a primary highway on which access to right-of-way is fully controlled, where the rights of ingress and egress from abutting properties have been legally eliminated and access to the freeway is allowed only at interchange locations. Many different terms, such as limited access, control of access, denial of access, no access, are used by the states to describe this control of access line. The term "controlled access right-of-way" for all such situations is used in this synthesis.

Historically, the longitudinal use of freeway right-of-way by utilities has been restricted by federal regulations to hardship cases, where it was proven to be extremely difficult or extraordinarily expensive for the utility to follow other alternatives. These alternatives may involve longer lines, deep cuts, river crossings, or traversing wetlands, forests, historical, or scenic areas.

This federal prohibition against such use was relaxed on February 2, 1988 when the Federal Highway Administration (FHWA) issued an amendment to its utility accommodation regulations. This amendment provided that each state, rather than the federal government, should decide whether utilities would be permitted to have longitudinal occupancy on its freeway right-of-way. As a result of this amendment, each state department of transportation (DOT) has reviewed or revised its policy on longitudinal occupancy by utilities.

This synthesis project was undertaken to assess the impact of the shift in responsibility for controlling freeway right-of-way from the federal government to the states and to determine the changes that have taken place in longitudinal use by utilities. It has been estimated that as much as $120 million per year of highway contractor claims result from utility conflicts (*1*). To clarify the issues and gain a comprehensive view of the state of the practice of this activity, a questionnaire was prepared and submitted to all 50 states and the District of Columbia in 1993/1994. A copy of the questionnaire is in Appendix A.

The high interest in this subject was clearly demonstrated by the return of all of the questionnaires. The findings of this synthesis are based on the review of these 51 replies and of 47 state accommodation policy manuals that were provided by respondents. Having the state accommodation policy for reference helped to clarify some questionnaire responses. The responses from the individual states are tabulated in Appendix B.

Questionnaires were not sent to utility industry representatives. Therefore, it should be noted that the results of this study are based entirely on the perspective of state transportation officials and not that of the utilities industry in accordance with the stated objective of this synthesis.

Available information from previous studies on safety issues, benefits to the public, and legal issues regarding longitudinal occupancy by utilities was also reviewed.

This synthesis reports on which states now allow longitudinal occupancy of freeway right-of-way, the types of utilities permitted, and the practices associated with such occupancy. Included are state DOT policies and experiences regarding:

- Highway user and utility worker safety,
- Special exceptions to right-of-way policies,
- Concerns specific to certain types of facilities,
- Controls placed on utility installations,
- Legal issues,
- Operational impacts,
- Lessons learned by states that have granted longitudinal occupancy,
- Equity issues,
- Policy differences between limited and controlled access routes, and
- Costs and concerns associated with utility installation and relocation.

This synthesis reviews the history of utility accommodation on freeways, and discusses, in Chapter 3, some of the conflicts and benefits resulting from joint use of freeway right-of-way. Chapter 4 summarizes the results of a questionnaire on the subject sent to all the states. Six of the questionnaire responses described special circumstances or situations that are discussed in depth as case studies in Chapter 5. Conclusions drawn from the accumulated state experience and recommended areas for additional studies are provided in Chapter 6. Appendix A contains a copy of the questionnaire that was submitted to state utility engineers. A tabulation, state by state, of specific responses to each of the questions in the questionnaire is included in Appendix B. Appendix C is a 1995 Policy Resolution by the American Association of State Highway and Transportation Officials regarding fiber optics.

CHAPTER TWO

HISTORY OF ACCOMMODATION

The placement and relocation of utility facilities on highway right-of-way have been a part of the Federal-aid highway program since 1916 (*2*). In the early years, utility facilities were as much in demand as the roads and were welcomed by the public. Property values were low and right-of-way for roads and utilities was generally provided at no cost by property owners eager to have the service. It was common practice for public utilities to occupy road and street right-of-way.

After World War II, when property values escalated and roads and utility service became more common, it became necessary to compensate property owners for the land required for highway and utility right-of-way (*3*). The joint use of right-of-way for highways and utilities was a natural evolution as a more cost-effective and efficient use of the land. Utilities frequently located on highway right-of-way and provided utility service to adjacent property owners.

The National System of Interstate and Defense Highways, which came into being in the 1950s, required nationwide planning. The 1956 Federal-aid Highway Act and ensuing standards provided for acquisition and maintenance of full control of access on the entire Interstate system to enhance the safety of the traveling public and to preserve the traffic-carrying capacity of the system (*2*). Access control was and continues to be considered one of the most significant and essential design features contributing to the safety and capacity of the system.

In 1959, after several years of development, the American Association of State Highway Officials (AASHO) adopted "A Policy on the Accommodation of Utilities on the National System of Interstate and Defense Highways" (*4*). This policy was created to:

- Develop and maintain access control,
- Increase highway safety and function to the maximum,
- Ensure uniformity of utility treatment among the states.

Because the extent and manner in which utilities occupy the highway right-of-way affects safety and capacity, very strict provisions for use of the right-of-way by utilities was mandated. The principal features of the AASHO policy dealt with conditions controlling the use of freeway right-of-way. Utilities were permitted to cross freeways if the facility could be installed and serviced from other than the through roadway and ramps. Existing utilities could remain in place if they met this same access test. New longitudinal installations were permitted only under special circumstances as "extreme case exceptions" and then only if they also could be installed and serviced in the same manner.

The AASHO policy was viewed as strongly discouraging the longitudinal use of Interstate right-of-way by utilities. Although this policy did not establish an outright prohibition of such use, it was recognized that only extreme case exceptions might be allowed when alternate installation conditions were extraordinary and costly (*2*). Most states interpreted this language to mean that new utility installations within the controlled access right-of-way for Interstates were prohibited.

The AASHO policy was accepted by the Bureau of Public Roads (BPR), the predecessor of the FHWA, as a design standard for utility occupancy on Interstate highway projects. States were required by the BPR to adopt a position at least as restrictive as the AASHO policy. Each request by a utility for longitudinal occupancy of Interstate right-of-way had to be approved by the BPR prior to the installation of the facility. Very few requests were approved. This policy was accepted as reasonable by most utilities and states and served the nation well during the initial construction of the Interstate Highway System (*5*). As a result, a considerable amount of highway trust fund and state tax dollars was spent clearing the Interstate right-of-way of utilities and locating them outside the access control lines. Consequently, freeway rights-of-way are now uncluttered. Exception has always been made for utility facilities required to serve highway facilities such as rest areas, signing, and lighting.

In 1966, the BPR extended application of the AASHO policy from Interstate highways to all Federal-aid freeways. In response to this action, AASHO in 1969 revised and reissued its "A Policy on the Accommodation of Utilities Within Freeway Right of Way" (*6*), expanding its scope from Interstate highways to all freeways. This reissue retained the extreme case exception-only basis for allowing utilities to longitudinally use freeway right-of-way.

A 1980 report by Kirk, entitled "Utility Relocation and Accommodation: A History of Federal Policy Under the Federal-Aid Highway Program, Part II: Utility Accommodation" examines the changing opinions and policies of the FHWA concerning the use of highway right-of-way by utilities (*7*).

Over the ensuing years AASHO continued to reevaluate its position regarding utility use of freeway right-of-way. Some states, other federal authorities, and the utilities industry continuously questioned the restrictive provisions of the AASHO and FHWA policies. The argument was presented that certain types of utilities, primarily fiber optics, could be permitted within freeway right-of-way with little adverse impact on safety or capacity.

In 1982, after much additional study and in response to the Surface Transportation Assistance Act of 1978 and amendments thereto, the American Association of State Highway and Transportation Officials (AASHTO), formerly AASHO, reissued its policy (*8*). While continuing to reaffirm limiting longitudinal use by utilities, the policy required that environmental and economic considerations be included as part of the decision-making process and recognized that adverse impacts may result from denial of such use.

On February 2, 1988, a significant change was made in the federal utility accommodation regulations. The FHWA promulgated an amendment to the regulations that adopted a more

flexible position on longitudinal occupancy of freeway right-of-way by utilities. This amendment generated considerable interest and controversy.

The revised regulations provided that, at a state's discretion, new utilities could be installed longitudinally within the controlled access right-of-way of any freeway. It had long been recognized that it was in the public interest for utility facilities to jointly occupy the right-of-way of public roads and streets when such occupancy did not interfere with the primary purpose of the highway (*2*). This was, however, the first time this concept was specifically directed toward freeway right-of-way. The amendment stated that conditions for such installation must be set forth in an FHWA-approved state DOT utility accommodation policy. An existing utility facility within proposed controlled access right-of-way could remain if it could be serviced, maintained, and operated without access from the through roadway or ramps and did not adversely affect the construction, operation, safety, maintenance, or stability of the freeway.

The FHWA required the state's policy to contain provisions for:

- Measures to ensure the safety of the traveling public,
- Measures to protect highway integrity,
- A utility strip to be established along the outer right-of-way,
- The state to retain control of the utility strip,
- Right-of-way fences to be retained, and
- Service connections from the utility strip to be prohibited.

While clearly recognizing the possible benefits of locating utilities in the highway right-of-way, the regulations made it clear that such use must be compatible with the primary function of the road, which is to carry traffic in a safe manner (*5*).

The revised FHWA policy no longer required states to adhere to the AASHTO utility accommodation policy, but instead provided that each state DOT could adopt its own freeway accommodation policy, one that best suited its needs and conditions. The FHWA directed each state to decide which utilities, if any, were to be allowed and under what circumstances.

Until this time, the FHWA had been instrumental in promulgating a policy on utility accommodations on freeways in cooperation with AASHTO to ensure that there would be no disparity of treatment of utilities among the states. Although this action seemed to reverse the stated goal, it was believed that each state was competent to determine its own utility policy. Utility policy is only one such area where the states have been given more control by the federal government.

Once the conditions for occupancy were determined by each state, its utility accommodation policy for longitudinal occupancy was to be revised accordingly. Each state was to determine appropriate safety requirements, construction procedures, and maintenance requirements.

FHWA regulation 23 CFR 645.209(c)(2) sets forth additional details to be addressed in developing a state freeway utility accommodation policy:

- The effects utility installations will have on highway and traffic safety will be ascertained. In no case shall any use be permitted which would adversely affect safety.
- Direct and indirect environmental and economic effects of any loss of productive agricultural land or its productivity that would result from the disapproval of the use of such right-of-way will be evaluated.
- These environmental and economic effects, together with any interference with or impairment of the use of the right-of-way which would result, will be considered.
- A utility strip will be established along the outer edge of the right-of-way by locating a utility access control line between the utility installation and the through roadway and ramps. Existing fences should be retained and except for freeways with frontage roads, planned fences should be located at the freeway right-of-way line. The state is to retain control of the utility strip and no service connections to adjacent properties shall be permitted from within the utility strip.

Once a DOT developed a freeway utility accommodation policy, the FHWA reserved the authority to review and approve such policy prior to its becoming effective. Upon FHWA approval of the policy, each state would administer its own plan and approve individual requests, without referral to the FHWA. The state could then administer the use of all highway right-of-way, freeway and otherwise. Each state would then be responsible for adhering to and enforcing its own policy and procedures. Only those cases that involve exceptions to the approved DOT policy would require FHWA review and approval.

In 1989, in response to the FHWA action, AASHTO again revised and reissued its policy (*9*) to be in general conformance with the FHWA regulations. However, the FHWA did not adopt the new AASHTO policy as its standard because the AASHTO policy was more restrictive than the new FHWA policy. Although not adopted, the AASHTO freeway utility policy continues to exist as a guide.

As state utility accommodation policies are being developed or updated, it is desirable to provide some record of the state of the practice. Therefore, the purpose of this synthesis is to gather in one document the benefit of experience gained since 1988 by various states and to share such knowledge.

The latest activity on the matter of longitudinal use of freeway right-of-way was taken by the Board of Directors of AASHTO, on October 29,1995, when Policy Resolution PR-21–95 was approved. This resolution recognized:

- AASHTO's long-standing opposition to the longitudinal use of freeway right-of-way by utilities.
- The rapid growth in telecommunications applications occasioned by and utilizing fiber optics technologies.
- The minimal disruption of traffic or hazard during installation of fiber optics, infrequent access for maintenance, its difference from other types of utilities.
- The use of fiber optic technology to enhance Intelligent Transportation System programs and projects.
- The pending U.S. Congress telecommunications legislation that would enable owners of rights-of-way to receive compensation for the use of freeway right-of-way and most likely preempt any state or local laws that inhibit or deny such use except in defense of the public safety and welfare.

This resolution acknowledged the distinction between buried fiber optic cables and other types of utilities and deemed it permissible to permit the longitudinal use of freeway rights-of-way for the former under appropriate guidelines while retaining existing policy in opposition to the longitudinal use of freeway rights-of-way for other utility types. The resolution further requested the preparation of appropriate guidelines on the technical, operational, economic and financial aspects of the placement of fiber optic cables in rights-of-way for eventual adoption by the Board of Directors and publication by AASHTO. A complete copy of the resolution is included in Appendix C.

CHAPTER THREE

CONFLICTS OF JOINT RIGHT-OF-WAY USE

Until the advent of the freeway system, utilities had traditionally shared right-of-way with highways. This need for sharing is generally and mutually recognized, varies only slightly from state to state, and has long been recognized by law. Utility facilities have always been part of the transportation system and like freeways, provide necessary services to the public. However, the difficulty occurs when service provided by one mode is interrupted or interfered with by another mode. Conflicts occur when utilities are brought into direct contact with highways, especially controlled access freeways. Furthermore, other factors, such as aesthetics and crowding tend to aggravate this perceived adverse relationship.

Freeways and utilities serve two different purposes. The highway system is for moving people, freight, and other goods at high rates of speed. Utilities move commodities such as water, electricity, sewage, and communications. Freeways provide mobility for people to get to the location of goods or services, utilities bring the goods or services to the people (*10*).

Freeways are normally built as single-purpose projects, which reduces the opportunity to use freeway construction to rebuild an entire corridor (*11*). The Case Studies in Chapter 5 (Iowa, Kansas, Massachusetts, Michigan, Minnesota, Missouri) provide examples where additional benefits have been obtained by proper highway planning.

There are advantages and disadvantages derived from longitudinal occupancy of freeway right-of-way by utilities. Which is most important depends on whether the perspective is that of the utilities industry or the state transportation departments.

Because freeways offer the most direct route between major population centers, longitudinal occupancy by utilities of controlled access right-of-way appears to offer the promise of cost savings to utility customers as well as overall societal benefits. This cost savings comes to the utility in two particular areas:

- Not spending revenue to acquire its own right-of-way, and
- Having a generally unobstructed area in which to build and maintain the new facility.

Such maintenance may have to be accomplished from outside the freeway right-of-way.

The direct economic benefits to a utility in using freeway right-of-way can be measured by computing the added costs the utility would incur if forced to use the next best alternative. The societal benefit of a utility using freeway right-of-way is the reduction of the total amount of land required, thereby releasing other land for productive purposes. This concept also prevents spoiling the landscape by the proliferation of utility installations and the resultant right-of-way required.

Societal arguments for permitting utilities to use freeway right-of-way lean heavily on the economic desirability of multiple use of scarce land and on the reduction of labor, materials, and other resources that accrue in the construction and maintenance of the facility. Less land is used and less labor is involved in the design because the area is void of improvements. Since the cost incurred by using attorneys, surveyors, appraisers, and negotiators many times exceeds the actual cost of the right-of-way, the administrative costs incurred in acquiring separate right-of-way for exclusive use of utilities is greatly reduced (*12*). However, this savings can be lost many times over if a state DOT project later requires the utility to move at company expense because the utility facility is on state right-of-way.

To the state this use of controlled access right-of-way is thought to be in conflict with the use, safety, and capacity of the freeway facility for which the DOT has acquired right-of-way. Other issues of concern to transportation agencies include utility construction and maintenance practices and the accommodation of additional utilities in the future.

Some conflicts between highways and utilities are:

- Utilities are generally installed on existing highway right-of-way.
- The health, safety, and welfare of the traveling public are of paramount concern.
- Roadways and utilities are maintained by two different groups with sometimes different interests.

Freeways are designed and built to serve only vehicle traffic, and the installation or maintenance of utility facilities has the potential for disrupting traffic. Utilities usually view their work as being necessary and of short duration, and see the problem as lack of patience on the part of highway users. The utility group views the DOT's requirements for installation and maintenance as being too stringent. The highway group views the utilities as trying to short-circuit standard operating procedures and sound engineering practices used in highway operations (*12*). Historically, there has been a lack of understanding by both of the other's needs and problems.

The DOT is charged with constructing, operating, and maintaining the highway safely and efficiently for the benefit of the traveling public. Many highway personnel feel that the use of highway right-of-way by the utilities is a privilege that is granted where practical and with adequate controls.

Since much of the current highway and street right-of-way is crowded with utilities, there is an objection to allowing the same situation to occur on the freeway right-of-way. However, it has long been recognized that efficient, safe, and effective use of highway right-of-way by utilities in a manner compatible with highway need and use is in the public interest. Once the utility is installed, it makes little difference to the motorist

if the facility is located just inside or outside the right-of-way line.

The February 1989, issue of *Right of Way* magazine presents three different perspectives of using freeway right-of-way for fiber optic systems. Those perspectives are of the fiber optic industry, the state DOT, and the FHWA, and are summarized below.

The fiber optic industry makes the case that:

- Systems can be directly buried or placed in conduits.
- Systems can be safely built and maintained in the outer edge of the right-of-way.
- Direct burial is fast and simple with up to 5 miles (8 km) of installation per day.
- Installation can be performed with minimum disturbance to the environment.
- With proper warning signs and with construction work being done at the edge of the right-of-way, freeway traffic should be only slightly affected.
- Equipment sites are 25 to 50 mi (40 to 80 km) apart and can be maintained from locations outside the right-of-way.
- No access for maintenance to the freeway right-of-way is needed, unless there is physical damage to the facilities (*13*).

The DOT perspective is that:

- The strict posture taken by the states to date has prevented excessive proliferation by utilities and has significantly contributed to the safety record of freeways.
- There is a sufficient amount of other right-of-way still available for fiber optic installations.
- Adequate provisions are made in the AASHTO Policy for use of freeway right-of-way in hardship cases where unique circumstances exist.
- Construction of numerous miles of utility facilities on freeway right-of-way would escalate traffic congestion, increasing the potential for accidents.
- Fiber optics on bridges would provide a single target for terrorist attacks designed to disrupt roadway and communication systems.
- The existence of utilities would increase the cost of highway maintenance, renovation, and reconstruction.
- The issue is not whether to allow fiber optics, but whether to allow any utility.
- Billions of dollars have been spent nationwide to clear and preclude reinstallation of utilities within the freeway right-of-way. It would not now seem prudent to provide this right-of-way for utility use (*14*).

The FHWA perspective provides that:

- Nonhighway use of freeway right-of-way is, and must be, limited and permitted only when it will not interfere with the highway and its safe use.
- Freeways are generally unencumbered by conflicts resulting from nonhighway related activities.
- The modern freeway is a self-contained system, within a protective envelope, whose sole function is the safe, efficient, and rapid movement of a large volume of traffic between major points.
- A freeway should be viewed as a national resource whose function and integrity should be preserved.
- There are few utility related accidents on freeways because the utilities thereon are permitted only under very carefully controlled conditions.

The FHWA perspective further considers that fiber optic cable is not materially different from any other low-maintenance underground facility. If fiber optic cable is allowed on freeway right-of-way, several questions arise:

- Can a state allow one fiber optic utility company and deny another?
- Can a state allow one type of utility company and deny another?
- What impact will these new installations have on future highway operations and expansions?
- What hidden liabilities will the state incur? (*15*)

In most cases the key is to initially acquire adequate right-of-way for dual use. This concept is especially critical in urban areas where land is in short supply, right-of-way is expensive, and demand for both freeway and utility services is high. Where joint use of right-of-way is not employed, the overall societal cost for providing the necessary services is much more than it need be. Although this concept is not as critical in rural applications, it still provides an overall more efficient use of available land, especially where wilderness or wildlife areas, forests or wetlands, historical or archeological sites may be encountered.

The two-corridor concept used in Michigan (See Case Study in Chapter 5) is one approach that may be applicable in other locations. Once the procedural arrangements are developed, the concept can be expanded to other routes and locations.

The complexity of this situation need not deter efforts to address these issues, seeking to balance the concerns of all parties and finding ways to make joint use of highways more efficient and less obtrusive. Consideration could be given to permitting a limited number of unobtrusive utilities to be located on freeways under carefully controlled conditions and by planning new highways in a manner conducive to the safety and efficiency of both the highway user and the utility provider.

It is useful to recognize that the freeway user and the utility rate payer are one and the same and that the resolution to these matters will come from a common viewpoint (*5*).

CHAPTER FOUR

CURRENT TERMINOLOGY AND UTILITY ACCOMMODATION POLICIES

A questionnaire (Appendix A) was developed and sent to all 50 states and the District of Columbia. Because all recipients responded, the results, summarized below, reflect the status of utilities on freeway right-of-way and indicate the great amount of interest in the subject. Current freeway right-of-way terminology and the general status of freeway utility accommodation policies are discussed first, followed by a detailed discussion of specific policies, practices, and experience.

POLICIES, PRACTICES, AND EXPERIENCES

The following discussion of results synthesizes the responses on general issues and follows the format of the questionnaire. Specific responses by states are included in Appendix B.

Freeway Right-of-Way Terminology

All states, except two, use some form of controlled or limited access terminology to describe the freeway right-of-way as shown in Figure 1, Distribution of terminology used by states to describe freeway right-of-way.

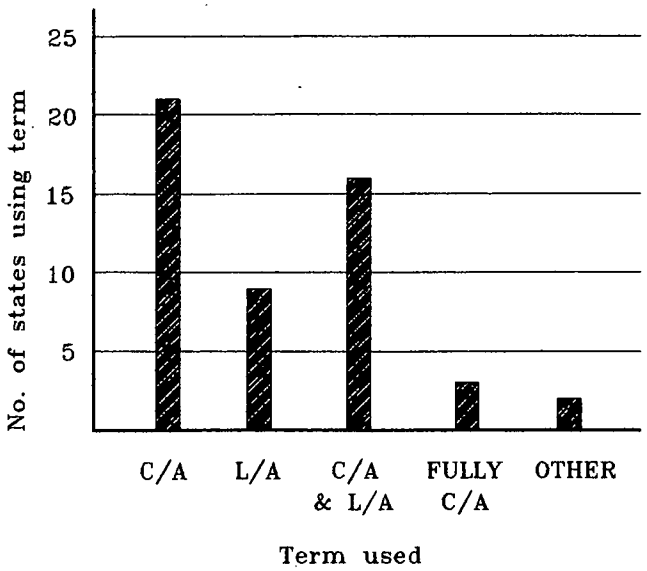

FIGURE 1 Distribution of terminology used by states to describe freeway right-of-way

Freeway Utility Accommodation Policy

All states have a written Utility Accommodation Policy for utilities on freeways. All except four states, Delaware, Montana, Rhode Island, and Vermont have policies that have been approved by the FHWA. These four policies are currently under review by the FHWA.

Forty-one states indicated that they have a Freeway Accommodation Policy as a separate publication or as a policy in addition to the AASHTO Policy. However, of these, 22 states used either the 1982 or the 1989 AASHTO policy as the primary conditions for longitudinal freeway accommodation.

Utilities Permitted

Twelve states indicated they would permit transmission type utility facilities to longitudinally occupy freeway right-of-way, and 39 states indicated they would prohibit such use, as indicated in Figure 2. Of the 12 states that permit longitudinal occupancy, eight express the permission in a positive manner and three express the permission in a negative manner. One permitting state did not provide a copy of the policy manual, therefore, the manner of expression was unknown. This distribution is indicated in Figure 3. Of the 12 states permitting occupancy, seven permit fiber optics only. Figure 4 shows the distribution of the type of utility facility permitted longitudinal occupancy of freeway right-of-way. Michigan, although having a strict utility accommodation policy on other freeways, does allow utility occupancy on one north/south and one east/west route in the state.

Special Circumstances, Exceptions, Hardship Cases, Etc.

All states that prohibit longitudinal occupancy have provisions for extreme case exceptions. Thirty-three states use the

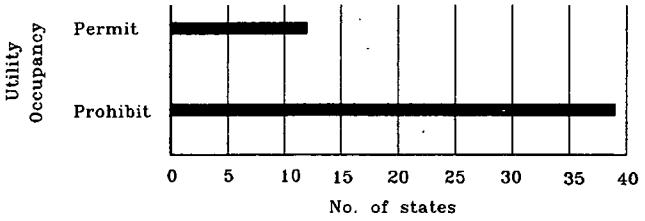

FIGURE 2 Distribution of states that permit/prohibit longitudinal occupancy of freeway right-of-way.

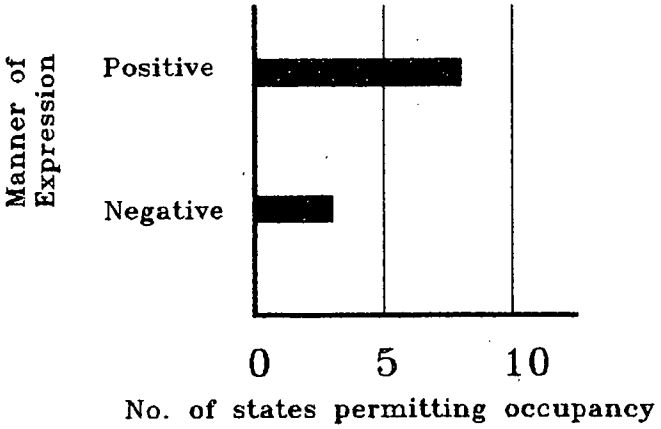

FIGURE 3 Number of states allowing longitudinal occupancy expressed in a positive/negative manner.

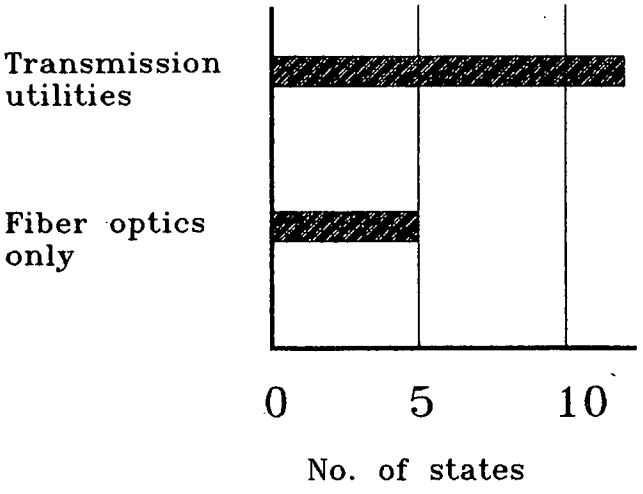

FIGURE 4 Type of utility permitted for longitudinal occupancy of freeway right-of-way.

specific provisions set forth in the AASHTO Policy as exceptions for hardship cases. Seven states provide for consideration where additional right-of-way is not available, is prohibitively expensive, or is unable to be acquired. Idaho establishes a definition of reasonable cost as less than a one percent increase in unit cost to customers over a 10-year period.

Kentucky may allow longitudinal occupancy if the relocation is part of a highway construction project and the fence can be moved inside the utility relocation. Adjacent frontage roads from which construction and maintenance can be performed are sometimes a prerequisite for longitudinal occupancy.

Three states specifically provide for utility attachment to structures over major bodies of water where other utility crossings are impractical, excessively costly, or would impact environmentally sensitive areas.

Procedure For Approval

All states, except for those that permit fiber optics, require satisfying the criteria set forth in the AASHTO Policy.

Controls on Longitudinal Installations

Almost all states prohibit any construction or maintenance from the through roadway or ramps and prohibit service connections from the freeway. Many require a utility strip to be established at the outer edge of the right-of-way. Georgia, Iowa, Michigan, and Nebraska have established extensive controls for longitudinal occupancy.

Concerns Regarding Certain Types of Utilities

Many states expressed concern over allowing hazardous materials (petroleum, oxygen, flammable gasses, electricity) within the right-of-way. Fiber optics installations were of the least concern, although New York outlines extensive procedures for such installations.

Required Safety Provisions

Traffic control in accordance with the Manual of Uniform Traffic Control Devices and state DOT manuals was almost universally required by the states. Installation and maintenance activities are required to be accessible from outside the controlled access right-of-way.

Legal Issues (Tort Liability, State Code Changes, Etc.) Experienced or Anticipated

Most states apparently believe that the construction, maintenance, surveillance, and periodic inspection of utility facilities could adversely affect the safe operation of the freeway and increase tort liability. However, there were no specific problems of this nature experienced by the states that have permitted longitudinal occupancy.

States may be liable for the future relocation of utilities permitted on freeway right-of-way.

Several states expressed concern over how to allow one utility company or one type of utility to use the freeway right-of-way while excluding others.

Other concerns were expressed over the states' liability due to negligence by a utility.

Iowa has passed a statute to ". . . develop an accommodation plan for the longitudinal utility use of freeway right-of-way. . . . " Some states are considering passing statutes to allow collection of a fee for the use of freeway right-of-way by utilities.

Several states are considering computer networking, intelligent vehicle highway systems, and public/private development for lease arrangements, franchising, and other joint activities. A legal basis would have to be developed for such arrangements.

Operational Impacts

Most often mentioned in survey responses was interference with the safe and free flow of traffic. Difficulty was anticipated

in preventing unauthorized parking on the shoulders and access to the utility work site from the through roadway and ramps. Motorist delays, slope erosion, and construction debris were of concern to others.

Iowa is completing a 350-mile (563 km) fiber optic line on freeway right-of-way in strict compliance with its policy and has experienced no problems.

Lessons Learned

The following general statements have been condensed from the questionnaire responses:

- The public and the utilities do not understand the purpose and importance of the fully controlled access feature of the highway and perceive it to be an unfair restriction.
- A successful project is contingent upon a cooperative working relationship with the utility and the contractor, with emphasis on a pre-construction meeting.
- The farther from the traveled way the utility is installed, the less impact there is on the motorist.
- If through-traffic lanes must be used for loading and unloading material, the work must be limited to non-peak traffic hours.
- Daily on-site inspection is required to ensure that the installation conforms with the permit conditions to prevent deviation from the approved plan.
- The concept of a utility strip near the edge of the right-of-way line is not always easily implemented.
- "Last resort-only reasonable route" to the utility means cost; to the DOT it means the operational characteristics of the highway, safety to the traveling public, and the investment in the highway facility.
- Exceptions should be made when warranted but not at the expense of endangering the public or diminishing the integrity of the highway.
- Longitudinal occupancy should be allowed only when denial results in significant hardship to the utility.

Utilities Most Likely to be Allowed Future Access

The majority of consent was given to underground utilities, with almost unanimous agreement on fiber optics or other underground communication facilities. Reasons given were:

- This type of utility does not endanger the freeway user,
- It is easy to install and maintain,
- Minimum right-of-way is required,
- Increased communication networks are vital to the nation,
- Political pressure.

Several states felt that no preference should be given to any one utility and that if any were allowed, all should be considered equally.

Utilities Least Likely to be Allowed Future Access

Most frequently listed were high-pressure gas, water, hazardous materials, and electric transmission lines. Reasons given were:

- These facilities are subject to damage, possibly resulting in freeway exposure to potentially hazardous waste material.
- Installation and maintenance of these types of facilities are more difficult,
- Potential damage to the highway.

Differences in Longitudinal Occupancy Policy for C/A & L/A

Where a state has both controlled access and limited access freeways, the controls on using the limited access right-of-way were generally somewhat less stringent. The limited access right-of-way is used on arterials, whereas the controlled access is used on the larger freeways and Interstates.

Elements of Cost Of Utility Installations and Relocations

Most states require the utility to be responsible for any future relocation expense. Alaska will bear the costs of relocations if required after 5 years. California pays if more than one relocation is required in 10 years. New Jersey statute requires the state to reimburse fiber optic owners to relocate for highway construction. Virginia statute provides utility relocations are at state cost.

Some state statutes provide that the state is responsible for the relocation of utilities owned by any governmental subdivision (i.e. city, town, municipality, public service district).

Several states expressed concern over additional costs to the DOT resulting from utility coordination, scheduling delays in construction caused by utility relocation delays, or higher bid prices from contractors because of working around existing utilities.

Many small utilities, municipalities and public service districts are financially insolvent or near bankruptcy. The DOT must either cancel or delay needed projects or pay the costs of relocations that are legally the responsibility of the utility.

Money spent for highways and utilities is all public money. Efforts should be made to minimize the total cost to both entities.

General Concerns

The most frequently listed concern was interference with traffic, roadside hazards, and increased operational costs to the state transportation agencies.

Much concern was expressed over the potential for the proliferation of utilities. Considerable money has been spent to clear the right-of-way of utilities and some states believe that

it does not now seem proper or prudent to allow the utilities to proliferate in the cleared areas.

The right-of-way acquired has generally been of sufficient width only for highway purposes and there is usually not sufficient extra right-of-way for use by utilities.

Trees and other vegetation serving as buffers may be damaged or lost.

A lenient policy will encourage a large number of requests causing excessive administrative costs to the state DOT in processing permits.

Safety Concerns

Many states expressed concern over abuse of access privileges by utilities. Improper and inadequate traffic control may cause motorists to encounter unexpected situations when coming upon utility work on freeways where a free-flowing traffic pattern is expected.

Others were concerned over a catastrophic failure of a high-pressure utility line or one carrying a hazardous material.

Benefits Accruing to the Public

The freeway creates an easy ready-made corridor for inexpensive use by a utility. Cleared right-of-way, with no uncooperative property owners, no conflicts with other utilities, and no obstacles to construction will reduce the construction costs of the facility.

Because the DOT is the only landowner involved, it is necessary to deal with only one landowner along a cross-country route. The ancillary costs of right-of-way acquisition, which sometimes exceed the actual cost of the land or easement, are eliminated, therefore, right-of-way costs are almost eliminated. This reduction in cost will be reflected in lower user fees.

Cooperation can open the door to telecommunication advances with the possible establishment of a national communications network. User fees can supplement DOT funds. The sharing of lines dedicated to governmental use is also a possibility.

Decreased adverse impact on agricultural land, public and private property, and wetlands is achieved when duplicate rights-of-way are avoided. The installed facilities are also protected from potential harm from farming and other activities. Limiting the number of parallel corridors is more environmentally and aesthetically sound.

OTHER OBSERVATIONS

Many states expressed the opinion that the savings to the utility would not be sufficient to offset the increased cost of operation of the freeway.

All states have essentially retained the current AASHTO Policy as the determining criteria for longitudinal occupancy. Iowa, Kansas, Minnesota, New Jersey, and New York allow only fiber optics and use the AASHTO Policy for all other utilities.

Another interesting observation is that most state utility/freeway policies are worded to the effect that "Utilities *will not be* permitted to longitudinally occupy freeway right-of-way *unless* the following criteria (AASHTO) are met." Other state policies say, "Utilities *will be* permitted to occupy freeway right-of-way *provided* that the following criteria (AASHTO) are met." Generally the same criteria are listed in both cases; the difference being that the restrictions are presented in the negative manner (will *not* be) as opposed to the positive (*will* be). Therefore, it is misleading to imply that a certain number of states are in favor of and permit longitudinal occupancy, while others prohibit longitudinal occupancy. In reality, only seven (about 14 percent) of the states were inclined to encourage any type of utility occupancy.

All states provide for extreme case exceptions. When such work is performed it must be with the safety of the traveling public as the prime concern. Requirements of state DOT traffic manuals and the provisions of the Manual on Uniform Traffic Control Devices are enforced.

Although much fear has been expressed concerning a state's legal liability, potential negligence by the utilities, and abuse of access provisions, there seems to be little, if any, actual and/or documented occurrence of these problems.

One concern is that the utility work will be an unexpected intrusion into the motorist's uneventful travel on the freeway. In reality, there is so much normal highway maintenance throughout the freeway system that the average motorist has come to expect work areas along the road and will hardly notice an occasional utility crew, provided that adequate warning signs are correctly posted.

CHAPTER FIVE

CASE STUDIES

Six responses to the questionnaire contained information relative to specific situations of interest to this study. These responses, from California, Iowa, Massachusetts, Michigan, Minnesota, and Missouri, were followed up by telephone discussions with appropriate state personnel to obtain additional information, which is presented below as an in-depth discussion of relevant issues.

CALIFORNIA

A 1976 incident precipitated the development of current California regulations. Caltrans Division of Right of Way has developed a "Manual on High & Low Risk Underground Facilities within Highway Rights of Way." This manual resulted from increased safety concerns after the 1976 accident involving a contractor working on a Caltrans project. An 8-in. (200 mm) gasoline pipeline, installed under a previously approved permit, was ruptured causing a spray onto nearby buildings. The gas ignited, nine people were killed, fourteen were injured, and extensive property damage resulted. Although the pipeline was known to exist, it's precise location and elevation were not known. The manual establishes standards regulating the identification, location, protection, installation, and relocation of new and existing high- and low-risk underground facilities within highway right-of-way.

This instance stands out in history as a good example of a reactive rather than a proactive policy. California has since consistently maintained a policy that longitudinal occupancy by utilities is prohibited on freeway right-of-way. Exceptions are made where it can be shown that such occupancy will not adversely affect the design, construction, operation, maintenance, or stability of the highway and that any other location would be inordinately difficult or unreasonably costly.

IOWA

Iowa's General Administrative Provisions for Highways, Section 314.21 states "The department shall develop an accommodation plan for the longitudinal utility use of freeway right-of-way, in consultation with the utilities board." The accommodation plan so developed provides that only underground utility facilities are permissible. Iowa has completed a state-owned 350-mi (563-km) fiber optic line on freeway right-of-way.

In addition to the normal AASHTO conditions for accommodations, Iowa requires the following:

Location and depth. A uniform alignment preferably within 8 ft (2.438 m) of the freeway right-of-way line and 36 in. (0.914 m) deep. Cable, except for multi-duct and isolated locations, shall be installed only by plowing.

Above ground installations. Identification signs shall be placed within 1 ft (0.305 m) of the right-of-way fence at the line of sight along the entire route. Specific requirements for the sign size, type, content, and intervals are contained in the plan.

Metallic warning tape. Metallic warning tape is required to be installed a minimum of 12 in. (0.305 m) below the existing grade and above the utility installation to facilitate future location. This provision would be especially beneficial in the location of non-ferrous pipe material. Another benefit is that a backhoe, plow, or other construction activity will encounter the warning tape before damaging the utility facility.

Engineering. The utility must retain a qualified engineering firm, unassociated with the utility, to perform construction inspection and to certify the method of construction, procedures followed, and location of installed facilities.

Multi-duct system. The department reserves the right to require facilities to be installed within a multi-duct system to be shared with others. Provisions are spelled out for sharing of the facility and cost.

Occupancy fees. Annual urban and rural occupancy fees have been established. A minimum fee and a per mile (1.609 km) fee have been established. The fee for urban areas is $9,000 per cable installation or $4,500 per cable mile (1.609 km) of occupancy, whichever is greater. The rural area fee is $7,500 per cable installation or $1,500 per mile (1.609 km), whichever is greater.

Future relocations. Utilities waive reimbursement for future relocation costs required by highway construction.

KANSAS

Kansas permits fiber optics to occupy freeway right-of-way. The minimum installation length in rural areas is 25 miles (40.23 km). In urban areas, the facilities may not start and stop in the same urbanized area. Exceptions are considered on a case-by-case basis.

When ducts are installed, two additional ducts with a minimum diameter of 4 in. (100 mm) are to be installed and are to become the property of KDOT.

MASSACHUSETTS

Massachusetts permits utility transmission and distribution facilities to occupy freeway right-of-way. The goal is to strike a balance between minimizing utility work on freeways and accommodating the public interest. Underground utilities are permitted on a case-by-case basis; above ground utilities only under unusual circumstances.

The permit application must address the manner of access, parking for work crew vehicles, traffic control, method of installation, erosion control and revegetation plan, manner and expected frequency of servicing, access provisions for servicing, and a demonstration of public interest.

MICHIGAN

Michigan's previous policy on the use of limited access right-of-way by utilities allowed longitudinal use only under extreme circumstances and it was felt that such a policy limited the opportunity for utility expansion. This policy remains in place except for two corridors that have been approved for longitudinal use, one east/west and one north/south:

- I-96 from US 31 in the City of Muskegon to I-75 in the City of Detroit.
- I-69 from the state line to US 27, US 27 from I-69 to I-75 and I-75 from US 27 to I-75 Business Route south of the City of Grayling.

This policy was established to prevent the Federal-aid highway system from acting as a barrier to necessary and orderly land use and development. The policy was developed on the basis that it is feasible to place longitudinal facilities within the right-of-way of limited access trunklines if the type and placement minimize the impact on freeway capacity and operation. Because limited access trunklines are arterial in nature, the type of utility facility that would breach access at the fewest locations and match the nature of the trunkline would be transmission lines. Therefore, access is limited to transmission lines. A lease agreement is used to establish the annual fees.

This provision allows utilities the advantages of using limited access right-of-way while furnishing the department an additional source of income without jeopardizing the primary function of the freeway facility.

Michigan requires the following special provisions in addition to normal requirements for accommodation for these two corridors:

Land use agreement and fee. A land use agreement and a fee that includes an appropriate charge to offset a portion of the capital and maintenance expense of the highway and to protect the needs of the transportation system are required. An annual lease fee per mile (1.609 km) or a minimum charge per year has also been established. The charge is sufficient to offset the costs incurred as well as to make a positive contribution toward capital and maintenance expense.

The terms and conditions of the lease shall avoid diversion of restricted funds to nontransportation purposes, protect the department's interests, and facilitate efficient and rational use of the right-of-way where multiple utilities may need to co-exist.

Type of facilities. Only continuous underground facilities with no service connections will be allowed. State law requires that any facility not underground must not be visible from the traveled way.

Multi-duct system. The department may require that a multi-duct system be installed.

Location. The preferred location is within 15 ft (4.572 m) of the freeway right-of-way line. All facilities are required to be within 18 in. (0.457 m) of the proposed location.

Maintenance. Facilities requiring regular maintenance must be placed outside limited access right-of-way.

As-constructed drawings. As-constructed drawings, certified as to exact vertical and horizontal location, are required within 90 days after the installation is complete.

MINNESOTA

Except in extreme hardship cases, Minnesota permits only fiber optic cable longitudinally on freeways. Minnesota has special conditions that apply in addition to the normal AASHTO policy.

All identifiable state DOT costs incurred in accommodating utilities during maintenance and reconstruction projects are charged to the utility. These costs include but are not limited to:

- Design—Costs for data collection and determination of the nature of construction phases.
- Reconstruction—Cost to work around utilities, construction delays caused by utility's delay in moving facilities, construction claims due to utility delays, utility claims due to loss of revenue caused by interruption of service.
- Maintenance—Costs for delays in performing highway maintenance due to utility's failure to locate their facilities.

The DOT may require a multi-duct system. The first utility may be designated as the "lead utility" and may be responsible for the design, construction, and maintenance of the system. Inner ducts within the system will be owned by the DOT. Subsequent occupants will be placed within one of the inner ducts and must purchase their share of the conduit system from the DOT and pay an annual fee. One inner duct may be reserved for government use.

The utility waives all claims to reimbursement of costs if the facilities have to be relocated for a future highway project.

MISSOURI

By special consideration, transmission and distribution lines may be allowed to longitudinally occupy freeway right-of-way. Underground utilities must be within 6 ft (1.829 m) and above ground facilities within 2 ft (0.610 m) of the normal right-of-way line, which is defined as an imaginary straight line that bridges sharp breaks in the true right-of-way line.

"Plowed in" communication cable installations have been noted for straying from uniformity and the 6-ft (1.829-m) wide corridor. A uniform manner of placement is essential to provide room for other utilities. In some instances, because of poor quality control, the utility installed a facility outside of the utility corridor. The violation was not discovered until after the installation was complete. The utility was required to move all portions of the facility that were outside the corridor.

CHAPTER SIX

CONCLUSIONS

The following conclusions can be drawn from the surveys completed by state DOT utility engineers.

Communication links are necessary between major metropolitan centers and smaller cities, which are also linked by Interstate highways and freeways. Fiber optics is a major development in the field of communications and it would appear logical to use the existing freeway right-of-way for installation of such networks.

An argument is made that utility installations adversely affect agricultural land and for that reason, freeway right-of-way should be made available. Although some crop damage may occur during construction, thereafter, there is generally no adverse effect. This is especially true for fiber optic installations. This has been recognized by the adoption of a Policy Resolution by AASHTO to permit longitudinal occupancy by fiber optics and by the development of guidelines for such occupancy.

The primary consideration of DOT officials is the safety of the traveling public. Most existing state regulations and the AASHTO Policy discourage longitudinal use of freeway right-of-way. Most DOT officials are of the opinion that the strict posture taken of excluding utilities has contributed to the increased safety of freeway facilities.

Eighty percent of those commenting indicated that if any utility were to be permitted on the freeway right-of-way, underground installations would be the most likely. Among underground utilities, the best case can be made for fiber optics, due to its ease of installation and low maintenance. The use of freeway right-of-way is attractive to save the time and expense of acquiring private right-of-way and to lower the cost of difficult construction. Many DOT officials believe that the fiber optics industry is leading the charge to use freeway right-of-way and are aware that once freeway right-of-way is opened to any utility, it becomes difficult to restrict others.

However, the presence of several utilities in one area magnifies the consequence of possible negligence, faulty material, and malfunctioning systems. Several utilities in a common area expose all to risk of damage from the same cause, natural or man made. Such installations also mandate complete and accurate as-built records to prevent extensive and costly interference with future utility or highway improvements.

Past experience indicates that the cost of highway maintenance and improvements, such as construction of additional lanes or interchanges or modification to existing lanes or interchanges, increases when utility coordination is required. This cost should be weighed against the cost to society for the utility to be required to use another corridor. It is increasingly difficult to monitor and prevent unauthorized work access points, parking of vehicles and equipment on the shoulders, and working from the through roadway and ramps. Because of funding availability, few states have sufficient inspection staff to ensure that proper signing and safety requirements are followed. One solution could be for utility inspection within highway right-of-way to be performed by independent inspectors, unassociated with the utility company, as a part of the permit approval process.

Although most freeway right-of-way was acquired with a width sufficient only for highway purposes, some right-of-way may be wide enough to also accommodate utilities. Because billions of dollars have been expended to relocate utilities off of freeway right-of-way, reversing that policy raises controversy. The questionnaire responses indicate that a few states are cautiously considering making this area available for utility installations:

- Ten states are considering the use of controlled access right-of-way by utilities.
- Of these 10 states, seven actually encourage the use of controlled access right-of-way by utilities.
- Six of these seven states allow fiber optics only.

Additional research in this area could include:

- Surveys of the utility industry to determine the utility perspective, practices, and experiences on the issues.
- Follow-up with those states allowing utility access in 5 to 10 years to determine the continued results of such access.
- Investigate future developments such as intelligent transportation systems and evaluate if utilities may benefit through joint development efforts.

This additional research will give the utilities industry the opportunity to present their opinions and views on this topic as well as accumulate more information as the process continues.

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Utility Accommodation Manuals for 47 States

APPENDIX A

1993–1994 Questionnaire

QUESTIONNAIRE

LONGITUDINAL OCCUPANCY OF LIMITED/CONTROLLED ACCESS RIGHTS OF WAY BY UTILITIES

NCHRP PROJECT 20-5
TOPIC 24-08

(Please type or print your responses)

A. **GENERAL**

1. List the person:

   a. In charge of administering your agency policies on longitudinal occupancy of Limited Access and/or Controlled Access rights of ways by utilities:

   Name:_____ Title:_____
   Agency:_____
   Phone:(____)_____ Fax:(____)_____
   Address:_____
   _____
   _____
   _____

   b. To call for clarification of responses or to obtain additional information on the subject:

   Name:_____ Title:_____
   Agency:_____
   Phone:(____)_____ Fax:(____)_____
   Address:_____
   _____
   _____
   _____

2. Which of the following terms does your agency use for freeway type rights of way?

   ___ Limited Access (L/A) ___ Controlled Access (C/A) ___ Both

   ___ Other: (Please list) _____

   _____

3. Does your agency have a written policy on longitudinal occupancy of L/A or C/A rights of way?

   ___ Yes ___ No
   Comments:_____
   _____
   _____
   _____
   _____
   _____

4. If yes, has the policy been approved by the FHWA?

   ___ Yes ___ No ___ Being reviewed by FHWA
   Comments:_____
   _____
   _____
   _____
   _____
   _____

5. If your answer to "C" is yes, is the policy on longitudinal occupancy a separate publication or do you use the AASHTO "A Policy On the Accommodation of Utilities Within Freeway Rights-of-Way"?

   ___ Separate Publication* ___ Use AASHTO Policy
   ___ Have policy* in addition to AASHTO policy
   * (Please enclose a copy if possible)

B. **POLICIES, PRACTICES, AND EXPERIENCES**

NOTE: Most of the following topics and questions are too complex to design a check-off or fill-in-the-blanks response form. Therefore, the questions will be listed, with room for your comments and/or explanations to be provided in essay form or by reference to your policy. Please use additional sheets if you need more space to provide your comments.

If you provide a copy of your Utility Accommodation Policy with the return of this questionnaire, questions may be answered by reference to the appropriate page number/section/item/etc. Additional comments, however, will be greatly appreciated.

NOTE: Please direct your responses on the following questions solely to the subject of longitudinal occupancy of freeway rights of way.

1. Which class of utilities does your agency permit to longitudinally occupy freeway rights of way?

   a. ___ Distribution
      (1) ___ Pipelines: Which types?_____
      (2) ___ Underground Electric
      (3) ___ Overhead Electric
      (4) ___ Underground Communications
      (5) ___ Overhead Communications
      (6) ___ Fiber Optics
      (7) ___ Other. List:_____
      (8) ___ None Permitted

   b. ___ Transmission
      (1) ___ Pipelines: Which types?_____
      (2) ___ Underground Electric
      (3) ___ Overhead Electric
      (4) ___ Underground Communications
      (5) ___ Overhead Communications
      (6) ___ Fiber Optics
      (7) ___ Other. List:_____
      (8) ___ None Permitted

2. If your agency does not normally allow longitudinal occupancy, under what circumstances, special exceptions, hardship cases, etc., if any, might longitudinal occupancy be allowed?

3. What procedure is required to obtain approval for such right of way use or access?

4. What controls are placed on longitudinal utility installations?

5. What specific concerns or requirements do you have relative to certain types of utilities (e.g. gas explosions)?

6. What safety provisions are required to insure protection of the highway user and the utility worker?

7. What legal issues (e.g. tort liability, changes to state codes, etc.) have you experienced or do you anticipate?

8. What other legal issues have or may arise from longitudinal occupancy?

9. What highway operational impacts may be involved by the initial construction or maintenance of the utility facility?

10. What lessons have you learned by good, bad, or interesting experiences in granting longitudinal rights of way occupancy?

11. Which utilities do you feel are most likely and least likely to be allowed future access to freeway rights of way, and why?

12. If your agency has both L/A and C/A rights of way, what differences in policy, if any, do you require between longitudinal occupancy of the two types of rights of way?

13. What present and future elements of cost are associated with utility installations and relocations?

14. What other concerns are associated with utility installations and relocations?

15. What are your specific concerns on safety issues?

16. That benefits will accrue to the public by permitting longitudinal occupancy or freeway rights of way by utilities?

17. Please list the source of any articles or other research of which you are aware on this subject. Provide publication or contact person's address and phone number, if possible.

Please complete and return your responses to:

Ronald L. Williams, P.E.
121 Cantley Drive
Charleston, WV 25314

Phone: (304) 342-3436 - (9AM-5PM Eastern Time)
(304) 345-3005 - (6PM-11PM Eastern Time)

PS: Please enclose a copy of your Utility Accommodation Policy.

APPENDIX B

QUESTIONNAIRE RESPONSES

Tabulated below are the individual state responses in the same sequence as the questions in the questionnaire. Some of the questions have been paraphrased for ease of review. If the exact wording of the question is desired, please refer to the questionnaire in Appendix A.

2. *Under what circumstances, special exceptions, hardship cases, etc., might longitudinal occupancy be allowed?*

AL AASHTO Policy exceptions.
AK AASHTO Policy exceptions.
AR AASHTO Policy exceptions.
AZ Show all possible alternates, with problems, costs, and environmental assessment, and prove it is in the public interest to use state right-of-way.
CA AASHTO Policy exceptions.
CO AASHTO Policy exceptions.
CT AASHTO Policy exceptions.
DE AASHTO Policy exceptions.
FL AASHTO Policy exceptions
GA AASHTO Policy exceptions.
HI AASHTO Policy exceptions.
ID AASHTO Policy exceptions.
IN Extreme hardship or unusual conditions.
IA SHA does allow longitudinal occupancy.
KS Extreme hardship or special exceptions.
KY AASHTO Policy exceptions. In hardship case, longitudinal occupancy sometimes is allowed if the relocation is part of a construction project and the C/A fence can be moved inside the utility.
LA Transmission facilities are allowed in highly urbanized areas where no additional property is available for utility right-of-way.
MD AASHTO Policy exceptions.
MI AASHTO Policy exceptions, however, underground utility permitted on one north/south and one east/west route in state.
MN Except for fiber optics, meet AASHTO Policy exceptions.
MS Special cases only.
MO Where outer roadway exists, and poles are within two feet (0.610 m) or underground is within six feet (1.829 m) of the C/A right-of-way, and the facility can be installed and maintained from the outer roadway, or if no practical alternative is available.
MT AASHTO Policy exceptions.
NB Only as last resort.
NV If to locate otherwise would damage or disrupt wet lands or remove agricultural lands from production. If there is no practical alternative available and the area desired is not needed for highway expansion. If private right-of-way is not available or is prohibitively expensive.
NH Extreme hardship.
NM Alternative location would be contrary to the public interest.
NY Except for fiber optics, meet AASHTO Policy exceptions.
NC AASHTO Policy exception.
ND AASHTO Policy exception.
OH AASHTO Policy exception.
OK AASHTO Policy exception or if impasse with adjacent property owner and it is in the best interest of taxpayers/ratepayers.
OR AASHTO Policy exception.
PA AASHTO Policy exception, distribution or transmission, with no service connections.
RI If in the best interest of the public and no feasible or prudent alternative.
SC AASHTO Policy exception. For short distances and for only extreme cases. Attachment to bridge over major river crossing when alternatives not available or too costly. To avoid impact on environmentally sensitive area. There is no other reasonable alternative.
SD AASHTO Policy exception. In unique and unusual situations, longitudinal attachments to structures is allowed over major bodies of water where other utility crossings are impractical, or result in excessive cost.
TN AASHTO Policy exception.
TX AASHTO Policy exception.
UT AASHTO Policy exception.
VT Economic factors.
VA AASHTO Policy exception.
WA AASHTO Policy exception.
WV AASHTO Policy exception.
WI Utility unable to acquire private right-of-way. To prevent significant loss of prime agricultural land. Large acquisition or construction costs.
WY Hardship due to terrain, environment, or extreme circumstances. Off highway easements not obtainable.

3. *What procedure is required to obtain approval for such right-of-way use or access?*

AL Meet AASHTO criteria.
AK Meet AASHTO criteria.
AR Meet AASHTO criteria.
AZ Meet AASHTO criteria and there is no reasonable other route. State not to incur unreimbursed additional expense or maintenance costs associated with installation or be liable for any claims, demands, costs or expenses, including legal expenses, or incur any loss, damages or injury out of utility's use of freeway right-of-way.

CA Same as AZ, plus, show that disapproval of the use would result in loss of, or loss of productivity of, productive agricultural land.
CO Meet AASHTO criteria.
CT Meet AASHTO criteria.
DE Meet AASHTO criteria.
FL Meet AASHTO criteria.
GA Meet AASHTO criteria.
HI Meet AASHTO criteria.
ID Demonstrate extreme hardship and/or unreasonable cost. Reasonable cost defined as less than a one percent increase in unit cost to customer over 10 year period.
IN Provide justification of design, environmental, and economic effects, including those on agricultural lands, which would result if occupancy approved, compared with the same effects if not approved.
IA Submit standard permit application to SHA.
KS Submit proposal in writing, agreement by SHA as to location and specifications.
KY Meet AASHTO criteria.
MD Meet AASHTO criteria.
MA See Chapter 5.
ME Submit "Joint Initial Application" to SHA.
MI Meet AASHTO criteria, except for one north/south and one east/west route on which utility submits application for permit to SHA.
MN Except for fiber optics, meet AASHTO criteria.
MO Utility must prove facility can be maintained from outside right-of-way or there is no practical alternative.
MT Meet AASHTO criteria. Must not be economically feasible to locate elsewhere.
NE State must concur there is no other feasible alternative.
NV Submit evaluation of alternatives and cost estimates to demonstrate longitudinal encroachment is the most practical and feasible alternate. It would benefit utility customers and highway users, and not be detrimental to highway facility.
NH Demonstrate extreme hardship if approval is denied.
NM Evaluate direct and indirect environmental and economic impacts which would result if denied.
NY Except for fiber optics, meet AASHTO criteria.
NC Meet AASHTO criteria.
ND Meet AASHTO criteria.
OH Meet AASHTO criteria.
OK To date permitted only during construction/reconstruction of roadway.
OR Meet AASHTO criteria.
PA Meet AASHTO criteria.
RI Meet satisfactory engineering and technical review.
SC Meet AASHTO criteria.
SD Meet AASHTO criteria.
TN Meet AASHTO criteria.
TX Show it will not adversely affect integrity of freeway, can be serviced from outside control of access, and will not interfere with future expansion of highway.
UT Meet AASHTO criteria.
VT Meet AASHTO criteria.
VA Meet AASHTO criteria. No tree removal or severe trimming allowed.
WA Meet AASHTO criteria.
WV Meet AASHTO criteria.
WI Justification for hardship.
WY Provide reasons and documentation for alignment studies, cost comparisons, environmental or archeological restraints.

4. *What controls are placed on longitudinal utility installations?*

AK Access for maintenance is prohibited from within controlled access limits or through highway.
AR Must not interfere with maintenance of right-of-way or any future highway project.
AZ Facility can not be constructed, or maintained by direct access from traffic lanes or ramps. No service connectors, valves, manholes, switches, etc. inside access control. Each maintenance activity requires separate permit. Each site inspected daily.
CA Must be located, designed, constructed and serviced without direct access from through roadways or connecting ramps.
CO Must be able to be placed underground with minimal effort, be low maintenance type facility, and be placed in a utility strip along the outer edge of the right-of-way.
CT Area must not be needed for future expansion. Utility strip to be established on outer edge of right-of-way. Nothing placed in clear zone. No access from through roads.
DE Must be able to be serviced without access from the through traffic roadways or ramps.
GA Extensive controls for location and alignment, cut and cover operations, clean up, traffic control, access, tree trimming, etc.
ID Where space is available, utility strip is established by inward relocation of access control line. Service connections not allowed from utility strip. Five foot minimum depth of cover.
IN Uniform alignment near right-of-way line. No installation or service from roadways or ramps. No service connections, maintenance points (manholes, etc.) inside right-of-way. No interference with safety, design, construction, operation, maintenance, stability or future expansion of highway.
IA See Chapter 5.
KY Must be within five feet (1.524 m) of C/A line.
KS Utilities must be in established utility corridor along outer edge of right-of-way. Must consider likely use of utility corridor by other utilities. No part of the facility in clear zone.
MD Utilities must be as close to right-of-way line as possible and maintained from outside controlled access highway and ramp areas.
MA No access from freeway. Adequate erosion control plan. Show manner and frequency of expected servicing.

ME Fiber optics only requiring little or no maintenance. No hazard to life, health, or property if severed or damaged.
MI Extensive requirements for underground continuous type facilities. No service connections.
MN No service connections. No access from roadways or ramps—locked gate may be allowed. Uniform alignment. Minimum 36 inches (0.914 m) depth. Must use utility sign markers.
MO Outer roadway must exist. Underground utilities must be within six feet (1.829 m), and above ground within two feet (0.610 m), of right-of-way line.
MT Meet extensive freeway occupancy regulations.
NB Each utility type has extensive requirements.
NV Locate as near to control limits as practicable. No access from roadway or ramps if possible. Must be no threat to motorist if facility fails.
NH Provisions for work zone, traffic control, and protection of worker and motorist. No service connections allowed.
NM No direct access for construction or service from through traffic or ramps. Cannot impair or interfere with present use or future expansion of freeway. At least one foot (0.305 m), but not more than five feet (1.524 m), inside access control line. All structural elements of underground installations must be below ground.
NY Traffic control plan (MUTCD), including access to facilities for operation and maintenance. Utility strip, 10 foot (3.048 m) wide, along the edge of right-of-way.
NC Utility strip must be established. No access from roadway or ramps. Suitable offset to meet clear roadside criteria.
ND No overhead installations. Need plan showing ingress and egress provisions during construction and maintenance beyond access control fences.
OH Show access to site for construction. Must be serviced without access to through roadways or ramps. Provisions for future maintenance. Location in relation to right-of-way line.
OK No access from through lanes or ramps.
OR Must meet clear zone requirements. No service connections. No access from through roadway or ramps.
PA Use can only be for specific utility.
RI Locations must be safe distance from traveled way and future maintenance operations. No access from through roadway or ramps.
SC No access from highway facility.
SD No access from highway facility.
TN No access from through traffic roadways or ramps.
TX Establish a utility strip. Site specific controls for safety of traveling public and integrity of highway.
UT Cannot locate in median, pavement area, shoulder or in ditch.
VT Underground. Outside clear area. No mainline access. Transmission lines only.
VA No access from through road or ramps.
WA No maintenance access from through lanes or ramps. Work restricted to non-peak hour traffic times.
WI Located at or near R/W line outside of fence. No access from traveled portion of freeway.
WY Access and egress tightly controlled. Permit given only for minimum distance necessary to bypass problem area.

5. *What specific concerns or requirements do you have relative to certain types of utilities?*

AL Same as on normal right-of-way.
AR Design is the same as for normal right-of-way. Must use traffic plan in conformance with MUTCD.
AZ Service connections, valves, manholes, switches or items requiring access not allowed inside control of access. Water lines in box girder bridges must be encased and vented. Gas lines in tunnels not allowed.
CA Concerns on underground hazardous utilities (petroleum, oxygen, chlorine, toxic or flammable gasses, natural gas, electric supply lines) and safety of public, state maintenance forces and utility workers.
CO With safeguards and sufficient justification gas or pressurized liquid lines could be permitted.
CT Overhead installations are unsightly. Gas, oil and petroleum products, and high pressure water lines may introduce a hazard in the event of failure.
FL Vehicles slowing down to leave roadway. Parking on shoulder. Workers on foot.
GA Transmission lines only are allowed. Large water line blow-outs. Gas lines may be a hazard to guard rail and sign crews. Utilities not abiding by access controls.
ID Five foot (1.524 m) cover on underground facility.
IN Industry standards are usually acceptable.
IA Cannot transmit gasses or liquid products that are flammable, corrosive, expansive, highly energized or unstable. Facility cannot present hazard to life, health, or property if it fails to function properly or is damaged. No service connections to adjacent properties.
KY Number one priority is highway safety. No one is to work on freeway right-of-way unless trained in highway safety.
KS Utilities not permitted to transmit gasses or liquids under pressure, or products which are flammable, corrosive, expansive, energized or unstable.
LA No joints under roadway. Steel lines must meet DOT Title 49 for wall thickness.
MA See Chapter 5.
MD Must be along right-of-way line with ample area outside ditch areas and ramps. Extra precautions taken when gas and liquid pipelines.
MN Only fiber optic facilities allowed except for special cases. Multi-duct system may be required by "Lead Utility". High pressure gas lines not allowed on bridges.
ME Only fiber optic facilities allowed. Traffic and worker safety concerns during construction.
MO No utilities in cloverleaf or directional interchanges.
MT Depth, location, clearance, pipelines on structures.

NB Extensive list for each type.
NV Disruption of traffic during installation and maintenance. Gas lines not permitted due to possible explosion. Limited to infrequently maintained facilities to limit aesthetic/environmental impacts.
NH Lines should be far enough from edge of pavement so as not to affect surface if repairs are necessary.
NJ Excludes all but fiber optic facilities.
NY Extensive procedures outlined in utility manual for fiber optics.
NC Aerial installations limited to self supporting single pole construction, preferably with vertical configuration. Must be installed so as to virtually preclude any necessity for disturbing roadways for maintenance or expansion. Must be as near outer limits of freeway as feasible.
ND Have concern for all longitudinal facilities, the Interstate system was provided for motoring public with no side distractions or interference.
OH General safety requirements—all utilities are treated equally.
OK Accidental dig-ins to pipelines or underground electric. Overhead electric lines are usually aesthetically objectionable.
RI Requirements for specific utilities. Concern for potential hazards.
SC The motoring public and integrity of highway facility. Motorists expect "clear sailing" not a detour for utility work.
TN No explosive material permitted.
TX Extra depth for fiber optics.
VT No public sewers, unstable liquids or gases. Proof that there is no detriment to life, health, or property if utility becomes disabled. Requires minimal maintenance.
VA Erosion of fill with water main break. Environmental clean-up with petroleum break or gas explosion.
WA Extensive requirements for each type utility.
WI Gas facilities limited to 150 psig when attached to any structure.
WY Very little difference in visual quality, threat, or hazard if utility is one foot inside or one foot outside right-of-way line. Difficult to control unauthorized access and damage caused to shoulders, drainage structures, ditches, fences, etc.

6. *What safety provisions are required to insure protection of the highway user and the utility user?*

AK Traffic control during construction shall conform to the MUTCD with SHA Supplement.
AR Traffic control must comply with MUTCD.
AZ Traffic control as per MUTCD and SHA Manual.
CA SHA has separate manual on High and Low Risk Underground Facilities on Right-of-way. Permit is required before utility can do any maintenance work. Work plan must be approved by state.
CO If access from through or connecting ramps is permitted, vehicles cannot impair flow of traffic. Locked gate on freeway fence may be permitted. Traffic control requirements must be met. Prior notice and approval required.
CT Adequate control of access to work zone and traffic control plan. Work plan to be approved by state.
DE Same as CT.
GA Well designed traffic control plan with monitoring during actual work.
ID Access limited via frontage roads, streets, or trails. Locked gate possible for periodic service. Access from through roadway or ramps permitted only in extreme emergency for repairs needed for immediate protection of property and persons or prevention of injury.
IN Normal construction practices and traffic control measures.
IA No access from freeway of ramps. No personnel, equipment or materials in median or within clear zone. Use MUTCD for traffic control. Make provisions for Safety, Health and sanitation.
KS No access from through traffic roadways or ramps. Nothing placed in clear zone. Work must include a traffic control plan in accordance with MUTCD/ permanent markers shall be placed.
KY Work must be done from private property and behind temporary fences. Traffic control in accordance with MUTCD. SHA has a "Guidelines for Traffic Control in Work Zones" Handbook available to all utility companies which gives general guidelines and shows example work zone setups.
LA Signing and flagmen.
MD No access from roadway or ramps. maintain clear zones. traffic control standards must be met. If limited right-of-way, Jersey barriers may be required.
MA MUTCD.
ME Traffic control plan and signs conforming to MUTCD.
MI Proper traffic control.
MN Access limited to cross roads, adjacent roads and gates in fences. Must abide by SHA Traffic Manual.
MO Material must meet extensive state specifications. Use of appropriate safety devices (MUTCD). Work at non-peak hours.
MT Traffic control plan for motorist and utility worker.
NE Traffic control plan and barricades.
NV Locate near outer right-of-way limits, outside clear recovery area. Constructed and maintained from outside main traveled way. Need approved traffic control plan.
NH No access from through roadway.
NJ MUTCD.
NM Must not adversely affect safety, design, construction, maintenance, or integrity of highway.
NY Utility strip, separate access roads, MUTCD.
NC A SHA inspector is assigned to insure all traffic and safety controls are followed.
ND Locations to be outside clear zone and as close to the access control fence as possible. Ingress and egress to be from backslope with no use of foreslope.

OH Access from other than roadway, proper traffic control, temporary fencing/barriers and controlling time of construction activities.
OK OSHA regulations and proper signing.
OR Proper signing. Pedestals to be one foot (0.305 m) inside right-of-way. Limited spraying. Must use durable material.
PA Must be at least 30 feet (9.144 m) from traveled way or install concrete barriers. Must comply with traffic control provisions.
RI MUTCD traffic requirements.
SC No access from through roadway or ramps. When bridge attachments require working from roadway, proper traffic control is required.
SD Provide maximum possible safety to traveling public.
TN Mains clearly marked above ground and shut off valves placed at appropriate locations.
TX MUTCD, OSHA, barrier treatments
UT Approved traffic control plan required.
VT MUTCD. SHA standards on traffic control. Follow National Safety codes as minimum.
VA Meeting normal and state regulations for pipelines.
WA MUTCD, OSHA, SHA manual.
WI MUTCD & extensive SHA Guidelines.
WY Ingress and egress must be from private land where possible. Traffic control provisions. Inspection at utility expense.

7. *What legal issues (tort liability, state code changes, etc.) Have you experienced or do you anticipate?*

AK Changes in vertical clearance standards and indemnification.
AR None.
AZ Utility signs agreement to accept liability for any injury and damage, including third parties, arising out of utility's use of right-of-way.
CA Longitudinal encroachments may result in accidents which expose state to additional liability. Maintenance, surveillance, or periodic inspection by utilities can adversely affect safe operation of freeway and increase tort liability.
CO No greater liability anticipated. If freeway right-of-way becomes more available, state may make legal provisions to lease such right-of-way.
CT No problems to date. State Statute permits longitudinal use of limited access highways by utilities.
GA Granting access to right-of-way may constitute a gift to the utility of a property right which is constitutionally prohibited.
IA State Statute passed to ". . . develop an accommodation plan for the longitudinal utility use of freeway right-of-way. . . ".
KS None.
MD Have experienced none and do not anticipate any.
ME Utility may be required to carry property damage and personal injury insurance and must indemnify and save harmless the state.
MN State Statutes regarding charging a fee must be approved.
MO Utility corridors are only six feet (1.829 m) wide. New safety act provides punitive damages for any person, including SHA, damaging utility without calling prior to digging.
NV If a utility facility is likely to be associated with injury or accidents to users of highway, utility will be required to make changes to reduce probability of injury or accident. Changes may be to highway or utility facility.
NH None.
NJ State Administrative Code revised.
OH Periodic lobbying by utilities for policies to be liberalized (particularly fiber optic cable companies want special treatment).
OK Possible problem with accidents involving utilities.
TN None.
TX Indemnity agreement required where depth of fiber optics is less than 42 inches (1.067 m).
UT None.
VA No changes made or proposed.
WI None.

8. *What other legal issues have or may arise from longitudinal occupancy?*

AR None expected.
CA Depending on circumstances, state could be liable for future relocations for highway improvements.
CO Advances in telecommunications, computer networking, and intelligent vehicle highway systems increase prospects of joint public/private development. Development will involve lease arrangements, franchising, and dedicating portions of facility to government use.
CT All utilities should be given equal treatment to prevent legal action by others.
FL Utilities could then force additional usage of freeway right-of-way.
GA Selectively allowing one utility the use while denying another utility gives one an advantage and may be illegal under state Statutes.
MD Failure to maintain clear zone could cause legal problems in future. Approved longitudinal installations must be adjusted if standards change.
ME Claims of unfair treatment from other utilities and possibility of giving unfair advantage to one fiber optic utility.
MI Multi-duct requirements abandoned due to legal issues.
MT Who is responsible if highway personnel damage a utility facility? What is state's liability if a utility negligently places a facility and that negligence results in property damage or personal injury to the traveling public?
NJ Statute now requires state to pay for relocating facilities for highway project. It needs to be revised to eliminate reimbursement for facilities allowed on freeways.
NM Reimbursement for relocations on Interstates.
NY None.

OH There is pressure to classify or categorize utilities—SHA is opposed to this.
OK Anticipate pressure from companies to longitudinally occupy freeways, especially fiber optic.
PA Transmission of hazardous material. Limiting right to occupy to only certain utilities.
RI Utility may have to purchase new right-of-way when area needed for road.
SC Until now the SHA has been able to deny access of utilities to controlled access facilities. This position will probably be challenged.
VT Future highway projects may have to absorb cost of relocations. State Statute requires reimbursement to utilities for limited access construction.
VA None.
WI SHA is considering allowing fiber optics on freeway right-of-way and collecting rent/fee from utilities. Would need enabling legislation.
WY Utilities whine for access to all highway right-of-way, pleading hardship and excessive costs. When relocation is required it is a hardship for the utility to comply. The public is inconvenienced and the SHA may have to bear part or all of the relocation cost.

9. *What highway operational impacts may be involved by the initial construction or maintenance of the utility facility?*

AR Hours of work may be restricted. Existing drainage facilities must be protected.
AK Interfere with free and safe flow of traffic or otherwise impair the facility or its visual quality.
AR Hours of work may be restricted. Existing drainage facilities must be protected.
AZ No access from lanes or ramps of highway, utility must obtain access from cross streets or from outside right-of-way.
CA Safety and operational impacts. A lot of money has been spent on controlled access freeways. To compromise their safety and operational integrity by allowing utilities to occupy them longitudinally does not make sense. Utilities will not be allowed to impede safe traffic operation of the freeways or the roadside recovery zones..
CO Perception by motorist of increased roadside activity. Risk of incidental damage to either highway or utility as consequence of increased joint use of right-of-way. Utility may violate terms of permit which adversely affect highway facility.
CT Utility work creates environment not conducive to safe motoring, where motorists reduce speed to observe activities.
DE Same as CT.
GA Access from mainline may create safety hazard for public. Traffic control may cause motorist delays. Erosion and water runoff problems. Utility construction or maintenance debris may clog drainage structures.
ID Difficult to prevent unauthorized access from freeway, parking vehicles and equipment on shoulders, etc.
IN Interference with highway safety, operation, and maintenance.
IA SHA is completing 350 mile (563 km) project where state owned fiber optic line is in freeway right-of-way in strict compliance with policy. No problems created.
KS Minimal.
KY Maintaining traffic through work zone and restoring right-of-way to original condition.
MA Highway "line drops" causing traffic backups.
MD Traffic backups during initial construction, disruption of traffic while facilities restored after severe weather damage. Buried cable may impact mowing, ditch trimming, etc.
ME Traffic delays and safety hazards to traveling public.
MI Freeway capacity and safety.
MN Traffic delays and safety hazard to motorist.
MO Construction or maintenance may interfere with traffic flow. Impact is usually minimal and acceptable.
MT Traffic control. Utility site cleanup. Damage to highway underground conduit or conductor. Unauthorized access or parking during construction or maintenance.
NE Care and maintenance of area disturbed during construction. Problems with future maintenance and beautification of area.
NV Delay, rerouting, detour of traffic. Delay of highway projects or maintenance while utilities are moved.
NH None are allowed.
NJ Driver distraction and reduction of speeds through construction areas.
NM Inspection and enforcement problems. Utility data management.
NY Some effect on traffic flow.
NC Disruption of traffic. Increase in maintenance. Disturbance of vegetation.
ND Motorist distraction during construction. Continual inspection to insure compliance with ingress and egress and having all areas restored to original condition.
OH Maintenance of traffic and restoration of the right-of-way.
OK Slow moving vehicles/equipment leaving and entering the through traffic lanes. Distraction near roadway.
OR Minimal.
PA Traffic safety.
RI Speed reduction through work zone.
SC Obstruction of the motorist. Additional construction time due to utility relocations if roadway is widened.
TX Traffic safety, capacity impairment, utility worker safety, highway maintenance concerns.
UT Not following traffic plans. Parking on shoulder. Leaving or placing equipment in clear zone.
VT Traffic control during construction. Facility should be located in utility strip outside clear zone. Not in median. Not accessible from mainline.
VA Road closures for replacing conductors for high voltage electric transmission facilities. Occupancy near

right-of-way will destroy much of natural buffer with adjacent properties.

WY Ingress and egress to work site. Interchanges are few and far apart, very few paralleling roads exist. Utility would generally have to access area from high speed traffic lanes with required accel/decel lanes.

10. *What lessons have you learned by good, bad, or interesting experiences in granting longitudinal occupancy?*

AR State will sometimes incur cost to move municipality or small water association facilities when they have insufficient funds to do so.

CA Contractor ruptured eight inch (203 mm) gasoline pipeline installed by permit. Line was known to exist but exact location and depth was not known. Gasoline sprayed nearby buildings, ensuing fire killed 9 people, injures 14, extensive property damage.

CO Public and utilities not well informed on the importance of fully controlled access feature of highways, and perceive it to be an unfair restriction against utility development. The highway agency must avoid proliferation of utilities yet recognize and grant exception when one is warranted.

CT The further away from the traveled way the utility is installed, the lesser impact on motorists during installation and maintenance.

ID Problems with proper signing, traffic control, installation procedures and accuracy of installed locations.

IA A cooperative working relationship with the contractor provides a successful project. Emphasis placed on pre-construction meetings where state lays groundwork with firm but cooperative direction.

KY Every company expects to be allowed to locate longitudinally on freeway right-of-way. There is no way to allow one company or class of facilities while denying another. Allow no longitudinal occupancy unless there is significant hardship and company can meet SHA conditions.

MD In planning and design stages of new or reconstruction freeway projects, allow a 10 to 15 foot (3.048 to 4.572 m) strip for utilities under certain conditions. Access to be from outside controlled access highways and ramps.

ME One installation has been completed with no problems.

MI Work closely with utilities.

MN Limited number granted to date. No adverse traffic effects experienced. Access minimized to loading and unloading material and equipment from main roadway during non peak traffic hours.

MO Some utilities placed facilities outside 6 foot (1.829 m) corridor and were required to relocate into the corridor. Uniform manner of placement is absolutely required so that other utilities can use the corridor. Quality control on placement is a must. Plowed-in communication cables have been notorious to stray from uniformity.

MT Traffic control during utility work is a concern. Utility placement at proper location and depth is hard to enforce and inspect.

NE Daily on site inspection is necessary to insure installation conforms with permit to prevent deviation and negative impact on highway operations.

NJ Possibility of interfacing utility fiber optic system with states intelligent vehicle/highway system.

NM Probably should not allow any installations inside access control on Interstates.

NY Have experienced problems with the idea of a utility strip. Interference with protected wetlands, rock out crops, etc. have forced changes. Utility strip concept is easier said than done.

NC Difficult to police and insure that work is not performed from through lanes. Removal of trees and other vegetation from outer limits of right-of-way eliminates buffer zone between highway and private property.

OH Understanding what "last resort—only reasonable route" means to utility as opposed to SHA. Utilities major factor often is cost. SHA considers operational characteristics of the highway, safety to motorist, and the investment in the highway.

OK Prohibiting utility occupancy eliminates interference to traveling public.

OR Not a good idea to grant routine requests.

PA No problems with short sections allowed so far. All are underground and transmission type.

SC SHA receives no benefit from permitting longitudinal encroachment.

TN By discouraging longitudinal installations, we have had fewer requests for hardship cases and no problems.

TX Use by utilities is strongly discouraged.

WA Review time for variance is more time consuming due to requirements needed to prove extreme case.

WI Longitudinal utility occupancy is not a black and white issue, but is a gray area. SHA is cognizant of utility's problem if it has to locate off the right-of-way. Exceptions can be made where warranted but not at the expense of endangering the public or diminishing the integrity of the highway.

WY Some utilities plead for an exception for them but not their competitor. Arguments defining what is or is not a public utility. Agency stating they did not have to comply with state laws and regulations.

11A. *Which utilities do you feel are most likely to be allowed future access and why?*

AL Underground communication—Do not endanger freeway user. Freeways are most direct route between major communication nodes.

AR Fiber optics for shared SHA use and a rental fee.

AZ Underground facilities.

CA Telephone, particularly fiber optics. Political pressure, increased competition, and need for better communications are reasons.

CT All are treated equally, reviewed on a case by case basis and judged on merit.
FL Underground utilities.
ID Fiber optics, underground communications and electric. Easy to install and maintain, require minimum right-of-way width.
IN Communication networks, underground transmission facilities—low maintenance, no obstructions in right-of-way.
IA Underground communications and fiber optics.
KS Fibre optics only.
LA All distribution lines are allowed.
MD Telecommunication—more demanding commodity with growth of fiber optics. State/private partnerships with telecommunications a possibility.
ME Fiber optics—ease of construction and installation, low maintenance and underground, no affect on aesthetics.
MI Communication fiber optics and water mains.
MN Fiber optics, city owned utilities and buried facilities are underground and create no safety hazard and require minimum maintenance. Governmental agencies.
MO Not distinguished by utility type.
MT Underground communication facilities.
NV Communication lines/fiber optics—By sharing corridors, lessens financial and environmental impacts on public and improves use of limited resources (land).
NH Underground utilities for safety reasons—but must be special cases.
NJ Fiber optics only.
NM Buried unpressurized facilities—less problematic and safe.
NY Fiber optics—SHA plan created to provide economically feasible corridor for this technology.
NC Underground transmission communication cables (fiber optic).—ease of installation and minimum maintenance.
ND Underground.
OK Fiber—least maintenance.
OR Buried communication.
PA If one is allowed, all must be allowed according to SHA legal division.
RI Fiber optics.
SC Fiber optic trunk lines—can be placed relatively quickly and easily. Maintenance is minimal and can be upgraded from both ends.
SD No longitudinal access anticipated.
TN Underground communication facilities, followed by water and underground electric—They are less dangerous and disruptive.
TX No preferential treatment.
UT Fiber optics or deep lines like sewers which would not be a maintenance problem.
VT Communications—Big lobby group. Pipelines.
VA Transmission facilities, however no pressurized lines.
WV Fiber optics, however if one is allowed, you may have to allow all.
WI Fiber optics—It is buried or placed in conduit, aesthetic impact and maintenance is minimal. SHA foresees using fiber optics with Intelligent Vehicle Highway Systems Freeway Traffic Management Systems. Having the fiber optics on the right-of-way provides a close and convenient source. Fiber optics is one of the most rapidly growing and advancing sources of communication which is vital to the maintenance and development of the nation's infrastructure.
WY Fiber optics systems will eventually get the nod. Political pressure on D.C. will tie the hands of the SHA to deny this private profiteering under guise of "serving the public", even though majority of circuits have been leased to private users with no private access.

11B. *Which utilities do you feel are least likely to be allowed future access and why?*

AL High pressure gas and electrical transmission facilities pose a danger to freeway user. Freeways do not necessarily go from source to distribution points for these utilities.
AR Water associations because of lack of financial strength.
AZ Above ground facilities.
CA Hazardous utilities because of safety implications.
CT None are excluded by category.
FL Overhead poles.
ID Overhead electric and communications, and pipelines. Overhead lines are aesthetically undesirable and a hazard to errant vehicles. Gas pipelines are subject to explosions and if ruptured could place hazardous waste on the freeway right-of-way. All facilities have negative environmental impact by disturbing existing vegetation during construction.
IA Flammable, corrosive, expansive, highly energized or unstable gasses or liquids.
KY All are least likely and hope they stay that way.
MD Gas transmission lines.
MO High-voltage transmission lines not accepted because they require large supports which could interfere with maintenance of right-of-way.
MT Overhead or above ground facilities.
NV Gas & electric—Potential for hazards.
NM Overhead and pressurized—safety and maintenance problems to owners and SHA.
NC Water and sewer distribution mains—More involved installation and high maintenance.
ND Overhead.
OK Electric—high maintenance and aesthetics.
RI Electric.
SC Distribution facilities of any kind—requires routine maintenance and service taps.
UT No flammable materials.
VT Power—Undergrounding would be too expensive.
VA No Pressurized lines.
WI Cable TV—Will not need freeway right-of-way.
WY Oil and Gas Pipelines.

12. *What differences in longitudinal occupancy policy, if any, do you require for C/A and L/A?*

AL On an arterial highway with limited access, the AASHTO Clear Zone requirements must be met.
AR More stringent control on fully controlled right-of-way.
CA None, both terms are interchangeable.
KY Partially Controlled Access—Can only limit ingress and egress to specific points. No utilities are preferred but cannot be enforced. Fully Controlled Ac cess—Utility companies not allowed.
MD L/A is used to control development along highway—utilities more likely to be allowed. C/A is used on freeways and Interstates—Utilities not allowed.
MO Freeways must have outer road for longitudinal utilities to be allowed.
MT On C/A, use by utilities is severely limited. L/A is treated like regular R/W.
NC Less stringent on hardship requirement on L/A if utility can be installed and maintained from outside traffic lanes.
ND Longitudinal occupancy permitted on L/A. Hardship cases only on C/A.
OK None on C/A. Permitted at designated locations on L/A.
TN In partially controlled access areas, utilities are allowed but only near the outer edge of the right-of-way with no service connections.
WI C/A—Allow transmission facilities under hardship cases.
L/A Allow transmission and distribution if feasible alternatives not available.
WY C/A—Extreme case exception only. L/A—Most utilities may be allowed parallel runs. Low pressure distribution lines allowed. Natural gas or petroleum product lines not considered to be utilities.

13. *What present and future elements of cost are associated with utility installations and relocations?*

AK Relocation costs will be born by state if relocation required after five years.
AR Utilities are moving onto private right-of-way which will cause reimbursable utility costs to rise on later projects.
AZ Utility to bear all costs for installation and future relocations.
CA State pays cost for more than one relocation in 10 year period.
CO SHA pays relocation cost for governmental subdivisions of state for facilities on right-of-way.
CT Utilities must relocate facilities at its own cost if placed in freeway right-of-way.
GA Delay costs due to untimely utility relocations when required for reconstruction of maintenance on highway.
ID Increased highway user costs due to traffic congestion, accidents caused by utility installations and relocations. Extra work involved to miss utility facilities on future highway improvements.
IN Can the utility afford the expense of future relocations?
IA Original installation and future relocation sole cost of utility.
KY If city, water district, water or sanitary association, state responsible for future relocations.
LA Utilities must relocate for highway project at own expense unless there first.
MD Scheduling delays and added construction costs for state on reconstruction projects. Relocation costs can be less if a utility corridor is provided.
MA All current and future costs are borne by utility.
ME All current and future costs are borne by utility, including state review and approval costs.
MI Future relocation at utility cost. However, SHA would incur costs while accommodating the utility.
MN Working around existing utilities can create contractors claims for additional compensation and time delays. Future reconstruction costs will increase if utilities to place their facilities within the right-of-way.
MO Utility must bear cost of future relocation.
MT Utility may have to pay cost of design for attachment to structures. State pays 75 percent relocation costs when utility occupies right-of-way.
NE Administrative cost of processing permit and inspecting installation. Future maintenance cost of working around facilities. High bid prices by contractors concerned about utility conflicts.
NH State is not responsible for any present or future costs.
NJ State Statue now would require state to reimburse fiber optic owner to relocate for highway construction.
NM Relocation reimbursement. Damage liability costs due to utility maintenance operations.
NY All costs borne by utility company.
NC Future relocations will be at the expense of the utility.
ND Any utility granted permit must relocate at own expense.
OH Cost of increased traffic control and maintenance, and costs to upgrade highway.
OK SHA usually pays for relocations when C/A is used. Utilities pay when L/A.
PA Utility is responsible for cost. Some administrative cost would be incurred.
RI Cost of SHA's preliminary engineering review.
SC SHA considers money spent for highways and utilities is all public money. SHA works to minimize cost to both entities when possible. SHA cost is minimal to permit occupancy, but future costs may be incurred by construction delays.
SD Utility is responsible for associated costs.
TN Administrative handling costs.
TX Allowing utility occupancy creates ever increasing crowded conditions thus more expense if utilities are reimbursed by state for relocations.

UT Utilities relocate at own expense and pay for any damage caused.
VT There should be no additional cost to the gas tax payers.
VA Potential need for sound barriers with removal of natural vegetation. Future utility relocation for upgrading road (current Statute would make this cost at state expense).
WA Installation and future relocations at utility expense.
WY State Statute provides for reimbursement of 50 percent of relocation costs for small utilities. Parallel utility installations on freeways would increase paperwork and permits, increase inventory records requirements, and present more factors to be concerned about during construction.

14. *What other concerns are associated with utility installations and relocations?*

AK Issues of liability, discovery of unknown under ground facilities.
AZ Interference with traffic, increased operational cost to agency, roadside hazards, impaired aesthetics or visual view to the motorist.
CA SHA has long history of protecting freeway right-of-way for unrestricted use of traveling public. Utilities are most eager and vocal in advocating a change of this position.
CO Proliferation of utilities. Equitable allocation of utilities within limited right-of-way. Diminished safety. Increased interference with highway operations and construction.
CT A proliferation of utilities within the freeway right-of-way and proposed installations could conflict with future development of highway.
DE State law.
GA Urban areas may not have enough right-of-way to share.
ID Freeway right-of-way is of sufficient width only for highway purposes, and must remain void of congestion caused by utilities. Future construction would be delayed and costs increased because of time consuming utility relocations.
IN Impact on future road improvements.
IA Drainage tile conflicts, interchange locations and major stream crossings.
KY State would have to maintain around above ground appurtenances which can increase delays, maintenance costs, etc.
MD Environmental impacts, damage to trees which act as buffer between housing and road (trees must be mitigated when cut). Aerial facilities impact aesthetics. Many times high voltage lines are objected to by the public.
MA Safe traffic operations, liabilities, fairness to provide access to all utilities.
ME Proliferation of utilities within freeway right-of-way and highway safety.
MI See Chapter 5.
MN Safety of traveling public. Maintenance of utilities along freeway. Freeway maintenance will have delays in completing work and safety of crews due to accidental damaging of utilities. Additional construction and reconstruction costs.
MO Relocating utilities in a timely manner. Delays to project completion schedules.
MT A more lenient policy will open up a large number of requests, causing additional cost to state if relocation required.
NE Danger of having buried electric lines and pipelines carrying flammable, explosive or poisonous materials within the right-of-way. Construction delays while utilities locate and flag underground facilities.
NH Cleanup after working within the right-of-way.
NJ Site restoration. Future maintenance. Disturbance of utility facility by state workers.
NM Knowledge regarding horizontal and vertical locations. Damage during highway maintenance. Inspection and enforcement issues due to limited resources.
NY Scenic vistas, loss of productive farm land, limiting future capacity and other highway improvements.
OK Safety of traveling public.
PA Maintenance of highway and dealing with utilities on future construction which is not now necessary.
TN Only concern is how to continue present policy of avoiding longitudinal installations on controlled access facilities.
TX Highway contractor delays.
UT Utilities placed in cut sections may disturb slope and trigger slides.
VT Area may not be available for utility strip area due to topography. Utilities may resist relocation when highway needs to expand.
VA Effect on adjacent landowners. Construction and maintenance safety issues. Prioritizing multiple requests for occupancy.
WI Breakaway construction, location and maintenance of facilities, erosion control, site restoration and clean-up, storage of work materials on site, structure attachments, compliance with permit requirements.
WY Most small utilities, municipalities and some large utilities are always broke. State must decide to either cancel needed projects, or postpone them until the utility has the money, or to pay for the relocations that should be at the utilities expense.

15. *What are your specific concerns on safety issues?*

AK Minimum clearance for overhead lines.
AZ Motorist may encounter unexpected situation, such as above ground obstacles, stationary utility vehicles, or utility work crews.
CA Safety of public and workers, preserving the free flowing operation of freeway, and preserving the option to maintain or improve the freeway as needed.
CO Abuse of access privileges. Catastrophic failure of utility line. Improper or inadequate traffic control.

CT Gas, oil, petroleum products, and high pressure water lines could cause hazard if failure.
DE We should not compromise the present level of safety afforded the traveling public.
FL Collisions with utility maintenance vehicles or fixed utility structures. Also concerned with undermining or damage to roadbed.
GA Difficult to enforce prohibition of access from the mainline.
ID Motorists are not expecting to see utility workers on the right-of-way.
IL Vehicles striking above ground utilities. Increased accident potential during construction of utilities.
IN Same as on any construction project.
IA Assuring utility is close to the right-of-way line so as to not interfere with smooth flow of freeway traffic.
KY Primarily concerned with safety of traveling public and workers. Also concerned with integrity of highway facility.
MD Vehicles parking on shoulder during maintenance to facility, especially in bad weather. Expected frequency of maintenance is a factor in approval.
MA Motorists safety, environmental safety.
ME Signing not being moved concurrent with work area. High speed traffic coming upon slow moving construction equipment.
MI Construction site access. Motorist attention and concentration diverted. Slow moving vehicles. Maintenance and emergency activities by utilities.
MN Traffic delays or accidents during construction or maintenance. emergency utility maintenance.
MO Utility companies may, to save costs, not properly inspect installations done by outside contractors which may result in underground facilities being damaged by others. Underground utilities need to be deep enough to avoid highway maintenance activities—could result in damage by others to communication cables (providing 911 service). Concerned with effects of electromagnetic radiation from high voltage lines.
MT Utility working from roadway shoulder or within right-of-way for maintenance.
NH Utilities in right-of-way add safety hazards.
NJ Safety of motorist during utility activities.
NM Lack of knowledge, training, education on utility industry requirements.
NY Worker and highway user safety during utility activities. Inherent risk created by the mere presence of utility.
NC Traffic control and work zone safety precautions.
ND Violation of ingress and egress.
OH Utility construction and maintenance activities can provide traffic hazards. Additional above ground obstructions are added.
OK Slow moving utility equipment encountering high speed freeway traffic. The more facilities allowed, the greater frequency of dig-ins is anticipated.
OR Traffic control during construction, maintenance, and emergency operations.
PA Utility equipment parked on thruway. Maintenance and protection of traffic.
RI Safety of construction workers, damage to utilities, safety to motoring public.
SC Control of access facilities are not the place for utilities. Motorists travel at high rate of speed and are not expecting to slow down, stop, etc. SHA must keep control of access freeways as clear as possible of any type obstruction.
SD Life and property.
TN Disruption of traffic and resultant accidents during installation or maintenance of utility. Danger to roadway maintenance crews when working in proximity to electrical or explosive material lines.
TX Direct access to through traffic lanes by slow construction equipment.
UT Non-compliance with approved traffic control during installation and maintenance activities.
VT Liquid and gas pipelines that want to attach to bridges. Utilities wanting access to utility strip from mainline.
VA Utility access from mainline or ramps. Stability of fill slopes around pressurized liquid lines.
WI Safety of traveling public and utility workers. Traffic control and work site safety. Obstructing or closing all or part of a traffic lane.
WY Utilities have downsized and are no longer able to provide timely responses to relocate for highway projects. Remaining personnel are too busy or too in experienced to properly perform.

16. *What benefits will accrue to the public by permitting longitudinal occupancy?*

AL More cost effective for utilities to locate on freeway. Savings can be passed on to consumers. Future relocation cost should be considered.
AR Fiber optics will provide better control for traffic control systems and improved access to information.
AK Less expensive to gain access and place facility on state right-of-way. Savings passed on to customer.
AZ Lower utility rates for right-of-way acquisition and less utility interference with individual properties.
CA Freeway right-of-way creates easy ready-made corridors for cheap use by utilities, which should lower utility fees, but not nearly sufficient to offset reduced safety and operation of the freeways.
CO Increased utilization of a limited resource, and possibly open the door to telecommunication advances.
CT Decrease adverse impact on agricultural land and public and private property. Maximize use of right-of-way. Reduce utility costs.
FL Savings realized by utilities should be passed on to the rate payers.
ID None to motorist. Money initially saved by using freeway right-of-way would be lost when the utility was required to relocate at its expense for future highway project.
IL Reduced cost passed on to consumers.

IN Cost savings—No property acquisition costs for utility. Easier initial construction, right-of-way usually clear of obstructions.

IA Decreased installation costs and complexities resulting in cost savings. Less interference from other utilities because of freeway's restricted use.

KY Right-of-way savings are minor compared to overall utility project. Benefits do not outweigh associated disadvantages.

MD Interstate communication facilities may benefit public. state can use these facilities for traffic control.

MA Better service by utility. Lower rates due to reduced right-of-way cost.

ME Make telecommunication advances available to the public.

MI It is important from a national standpoint to make available the freeway right-of-way for a national communications network.

MN Reduced right-of-way and construction cost because freeways are free of obstacles—including utilities.

MO Freeway rights of way are traditionally wide for future growth and can be compatible to both. With strict controls, the land can be compatible for both since private right-of-way is more difficult to acquire.

MT May result in reduced subscriber rates or better access to a particular facility.

NE No benefit to public. State terrain and population density does not require use of freeway right-of-way.

NV Cost sharing/lessening passed to customer. Land saved remains in production and useable and on tax roll. Isolated locations makes it safer for neighborhood. Having fewer corridors is more environmentally or aesthetically sound.

NH Lower rates because no easement costs. Less environmental impact.

NJ Occupancy fees could help offset transportation budget. Use of fiber optic system for motorist information and traffic control system.

NM Stable or reduced utility rates. Less environmental disturbance. Preservation of open space. Reduced transportation program costs.

NY Lower costs of doing business for utility. Fees levied by SHA can go for highway improvements.

NC Minimize environmental impact by using established right-of-way. Lower installation costs, no right-of-way to be secured, will provide more economical service to consumers.

ND Less right-of-way costs.

OH Slight reduction of right-of-way costs to utility. Minimal or no disruption to private property.

OK Utilities will not have to acquire and clear right-of-way. However, the primary purpose of the freeway is unobstructed, non-interference route for traveling public.

RI Possible lowering of utility costs. Revenue from utility easements to be used for highway improvements.

SC No benefit to public. Some benefit to placing major trunk lines on right-of-way. Utility is required to re locate at its expense if necessary for highway improvements.

TN Lower utility rates which could be offset by higher cost to highway user. Difficult to determine what, if any.

UT It will save rate users, where costs to locate a facility off the right-of-way are extremely high .

VT Utility may save money.

WA Savings to the consumer. In some cases may lessen environmental impact.

WI Reduction of physical and aesthetic impact to agricultural lands and home owners. Elimination of separate utility corridor. Reduction of impact on wildlife habitat fragmentation. Reduced cost of construction. Fewer service disruptions because of being out of reach of machinery or equipment.

WY None. Money saved on right-of-way will go to investors instead of reduce rates. Utilities do not want to condemn to get right-of-way.

17. *Articles or other research.*

CO, MI "Feasibility of Using Interstate Highway Right-of-way to Obtain a More Serviceable Fiber-Optics Network," Rand Corporation, Jan 1988 "Fiber Optics Cable Installations in Freeway Corridors," prepared for Province of British Columbia Ministry of Transportation and Highways, Highway Planning Branch, by Transmode Consultants, Inc. October 1990. "Longitudinal Occupancy of Freeways by Utilities," NCHRP Project No. 20-7, Task 11, Byrd, Tallamy, et.al., unpublished, July 1978.

GA Duane O. Christensen, Road Design Engineer, Oregon DOT, Transportation Building, Salem, OR 97310, Chairman of AASHTO Fiber Optics Task Force.

NC, OH, TN "Utility Facilities on Limited Access Right-of-way", Najafi, Fazil, Assistant Professor, (904)392–9537, Florida DOT Research Project, Administered by University of Florida, College of Engineering, Department of Civil Engieering, Gainsville, FL. 32611

TABLE B-1

STATE RESPONSES TO GENERAL QUESTIONS ON FREEWAY POLICY

State	Term for Freeway ROW	Written Freeway Policy	Policy Approved by FHWA	Have Separate Publication	Use AASHTO Policy	Have Policy in addition to AASHTO	Sent Copy of Policy
AL	C/A & L/A	YES	YES	Essentially same as AASHTO	YES		YES
AK	C/A	YES	YES		YES		YES
AZ	C/A & L/A	YES	YES	Essentially same as AASHTO	NO		NO
AR	C/A & L/A	YES	YES			Essentially same as AASHTO	YES
CA	C/A & L/A	YES	YES		NO		YES
CO	Fully C/A	YES	YES			Essentially same as AASHTO	YES
CT	L/A	YES	YES			Essentially same as AASHTO	YES
DE	Denial of Access	YES	Being reviewed			Essentially same as AASHTO	YES
DC	C/A	YES	YES			YES	YES
FL	L/A	YES	YES	Essentially same as AASHTO			YES
GA	L/A	YES	YES		YES		YES
HI	C/A & L/A	YES	YES		YES		YES
ID	C/A	YES	YES	Essentially same as AASHTO			YES
IL	C/A	YES	YES		YES		YES
IN	L/A	YES	YES	YES			YES
IA	Fully C/A	YES	YES	YES			YES
KA	C/A	YES	YES	YES			YES
KY	C/A & L/A	YES	YES		YES		YES

State	Term for Freeway ROW	Written Freeway Policy	Policy Approved by FHWA	Have Separate Publication	Use AASHTO Policy	Have Policy in addition to AASHTO	Sent Copy of Policy
LA	Control of Access	YES	YES		YES		YES
ME	C/A	YES	YES	YES			YES
MD	C/A & L/A Right of way line of through highway	YES	YES	Essentially same as AASHTO			YES
MA	C/A	YES	YES	YES			YES
MI	L/A	YES	YES	YES			YES
MN	C/A	YES	YES			Essentially same as AASHTO	YES
MS	C/A	YES	YES				NO
MO	Fully C/A	YES	YES	YES			YES
MT	C/A	YES	Being reviewed			Essentially same as AASHTO	YES
NB	C/A	YES	YES	Essentially same as AASHTO			YES
NV	C/A	YES	YES			YES	YES
NH	L/A	YES	YES	Essentially same as AASHTO			YES
NJ	L/A	YES	YES	YES			YES
NM	C/A	YES	YES	YES			YES
NY	C/A	YES	YES			Essentially same as AASHTO	YES
NC	C/A & L/A	YES	YES			Essentially same as AASHTO	YES
ND	C/A & L/A	YES	YES	YES		Essentially same as AASHTO	YES

State	Term for Freeway ROW	Written Freeway Policy	Policy Approved by FHWA	Have Separate Publication	Use AASHTO Policy	Have Policy in addition to AASHTO	Sent Copy of Policy
OH	C/A & L/A	YES	YES	YES		YES	YES
OK	C/A	YES	YES		YES		NO
OR	C/A & L/A	YES	YES			YES	YES
PA	C/A & L/A	YES	YES		YES		YES
RI	C/A & L/A	YES	Being reviewed			YES	YES
SC	C/A & L/A	YES	YES		YES		YES
SD	C/A	YES	YES			Essentially same as AASHTO	YES
TN	C/A	YES	YES	Essentially same as AASHTO			YES
TX	C/A	YES	YES	Essentially same as AASHTO			YES
UT	No Access	YES	YES		YES		YES
VT	L/A	YES	Being reviewed			YES	NO
VA	C/A	YES	YES	Essentially same as AASHTO			YES
WA	L/A	YES	YES			Essentially same as AASHTO	YES
WV	C/A	YES	YES		YES		YES
WI	C/A & L/A	YES	YES	Essentially same as ASSHTO			YES
WY	C/A & L/A	YES	YES	YES		YES	YES

Note: C/A = controlled access; L/A = limited access.

TABLE B-2

STATE RESPONSES REGARDING UTILITIES PERMITTED LONGITUDINALLY ON FREEWAY RIGHT-OF-WAY

State	Transmission Lines	Distribution Lines	Policy Expressed Pos / Neg	Exceptions Allowed
AL	NO	NO	NEGATIVE	Only on arterial L/A
AK	NO	NO	NEGATIVE	YES
AZ	NO	NO	NEGATIVE	YES
AR	NO	NO	NEGATIVE	YES
CA	NO	NO	NEGATIVE	YES
CO	NO	NO	NEGATIVE	YES
CT	NO	NO	NEGATIVE	NO
DE	NO	NO	NEGATIVE	YES
DC	YES	YES	POSITIVE	YES
FL	NO	NO	NEGATIVE	YES
GA	NO	NO	NEGATIVE	YES
HI	NO	NO	NEGATIVE	YES
ID	NO	NO	NEGATIVE	YES
IL	NO	NO	NEGATIVE	YES
IN	NO	NO	NEGATIVE	YES
IA	Underground communications, fiber optics	Underground communications, fiber optics	POSITIVE	YES
KA	Fibre optics only	Fibre optics only	POSITIVE	YES
KY	NO	NO	NEGATIVE	YES
LA	NO	NO	NEGATIVE	YES
ME	Fiber optics only	NO	NEGATIVE	YES
MD	NO	NO	NEGATIVE	YES
MA	YES	YES	POSITIVE	YES
MI	Fiber optics only	NO	POSITIVE	YES
MN	Fiber optics only	Fiber optics only	POSITIVE	YES
MS	NO	NO	NEGATIVE	YES
MO	YES	YES	POSITIVE	YES
MT	NO	NO	NEGATIVE	YES

State	Transmission Lines	Distribution Lines	Policy Expressed Pos / Neg	Exceptions Allowed
NB	NO	NO	NEGATIVE	YES
NV	NO	NO	POSITIVE	YES
NH	NO	NO	NEGATIVE	YES
NJ	Fiber optics only	Fiber optics only	NEGATIVE	YES
NM	YES	YES	POSITIVE	YES
NY	Fiber optics only	Fiber optics only	NEGATIVE	YES
NC	NO	NO	NEGATIVE	YES
ND	NO	NO	POSITIVE	YES
OH	NO	NO	NEGATIVE	YES
OK	NO	NO	NEGATIVE	YES
OR	NO	NO	NEGATIVE	YES
PA	NO	NO	NEGATIVE	YES
RI	NO	NO	NEGATIVE	YES
SC	NO	NO	NEGATIVE	YES
SD	NO	NO	NEGATIVE	YES
TN	NO	NO	NEGATIVE	YES
TX	NO	NO	NEGATIVE	YES
UT	NO	NO	NEGATIVE	YES
VT	YES	NO		YES
VA	NO	NO	NEGATIVE	YES
WA	NO	NO	NEGATIVE	YES
WV	NO	NO	NEGATIVE	YES
WI	NO	NO	NEGATIVE	YES
WY	NO	NO	NEGATIVE	YES

APPENDIX C

AASHTO POLICY RESOLUTION

As approved by the AASHTO Board of
Directors on October 29, 1995

POLICY RESOLUTION PR-21-95

Title: Installation of Fiber Optic Facilities on Highway and Freeway Rights-of-Way

WHEREAS, AASHTO has long maintained a policy in opposition to the longitudinal use of freeway rights-of-way for utilities; and

WHEREAS, there has been and will continue to be rapid growth in telecommunications applications occasioned by and utilizing fiber optics technologies; and

WHEREAS, buried fiber optic cable can be installed with minimal disturbance of existing traffic, require infrequent access for maintenance purposes, can usually be sited to even further minimize disruption or hazard to vehicular freeway users, and in other ways can be distinguished from other types of utilities such as pipelines and electrical transmission facilities; and

WHEREAS, fiber optic technology can be used to enhance Intelligent Transportation System program and projects; and

WHEREAS, the U.S. Congress is nearing completion of a telecommunications act which inter alia will likely enable the owners of freeway and highway rights-of-way the ability to receive cash and non-cash compensation for the use of such rights-of-way for installation of fiber optic cable, and further will likely provide for preemption by the Federal Communications Commission of any state or local laws or regulations which inhibit or deny such use except in defense of the public safety and welfare; and

WHEREAS, at its April 1995 meeting the Standing Committee on Highways (SCOH) established a Task Force on Utilities in Highway Right-of-Way to evaluate and advise on issues raised by the pending legislation and the subject of fiber optics in highway rights-of-way; and

WHEREAS, the task force and SCOH have further reviewed this subject and believe that formal action by the Board of Directors is in order;

NOW, THEREFORE, BE IT RESOLVED that the AASHTO Board of Directors acknowledges the distinction between buried fiber optic cables and other types of utilities, wherein it is deemed permissible to permit the longitudinal use of freeway rights-of-way for the former under appropriate guidelines while retaining existing policy in opposition to the longitudinal use of freeway rights-of-way for other utility types; and

BE IT FURTHER RESOLVED that the AASHTO Board of Directors requests the Standing Committee on Highways, in consultation with the task force, its affected Subcommittees and other AASHTO Committees as appropriate, to prepare appropriate guidelines on the technical, operation, economic, and financial aspects of the placement of fiber optics in highway and freeway rights-of-way for eventual adoption by the Board of Directors and publication by AASHTO.

THE TRANSPORTATION RESEARCH BOARD is a unit of the National Research Council, which serves the National Academy of Sciences and the National Academy of Engineering. It evolved in 1974 from the Highway Research Board, which was established in 1920. The TRB incorporates all former HRB activities and also performs additional functions under a broader scope involving all modes of transportation and the interactions of transportation with society. The Board's purpose is to stimulate research concerning the nature and performance of transportation systems, to disseminate information that the research produces, and to encourage the application of appropriate research findings. The Board's program is carried out by more than 270 committees, task forces, and panels composed of more than 3,300 administrators, engineers, social scientists, attorneys, educators, and others concerned with transportation; they serve without compensation. The program is supported by state transportation and highway departments, the modal administrations of the U.S. Department of Transportation, the Association of American Railroads, the National Highway Traffic Safety Administration, and other organizations and individuals interested in the development of transportation.

The National Academy of Sciences is a nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Upon the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Bruce Alberts is president of the National Academy of Sciences.

The National Academy of Engineering was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encouraging education and research, and recognizes the superior achievements of engineers. Dr. Harold Liebowitz is president of the National Academy of Engineering.

The Institute of Medicine was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences, by its congressional charter to be an adviser to the federal government and, upon its own initiative, to identify issues of medical care, research, and education. Dr. Kenneth I. Shine is president of the Institute of Medicine.

The National Research Council was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Bruce Alberts and Dr. Harold Liebowitz are chairman and vice chairman, respectively, of the National Research Council.

Transportation Research Board
National Research Council
2101 Constitution Avenue, N.W.
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ADDRESS CORRECTION REQUESTED

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