Guidance

on Sharing Freeway and Highway Rights-of-Way for Telecommunications

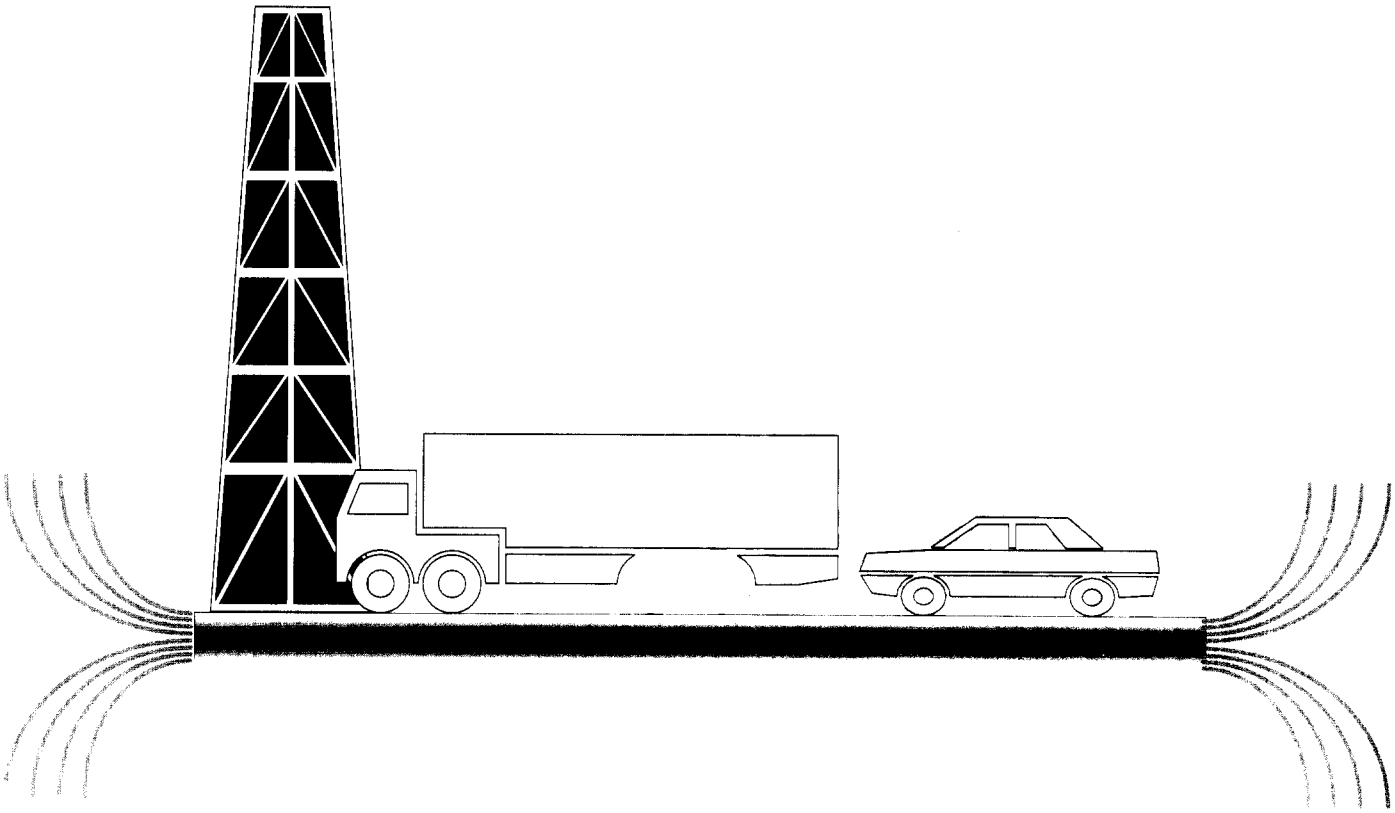
AASHTO Task Force on Fiber Optics
on Transportation Rights-of-Way

American Association of State Highway and Transportation Officials

Guidance

on Sharing Freeway and Highway Rights-of-Way for Telecommunications

AASHTO Task Force on Fiber Optics
on Transportation Rights-of-Way



Published by the
American Association of State Highway
and Transportation Officials

444 North Capitol Street, NW, Suite 249
Washington, DC, 20001

(202) 624-5800 *(tel)*
(202) 624-5806 *(fax)*
http://www.aashto.org/main

© Copyright 1996 by the American Association of State Highway and Transportation Officials. This document, or parts thereof, may not be reproduced in any form without written permission of the publisher.

ISBN 1-56051-045-5
Printed in the United States of America

Contents

Acknowledgments ii

1996 AASHTO Subcommittee on Advanced Transportation Systems iii

1996 NCHRP Advisory Panel 20-7, Task 76 Fiber Optics Facilities on Transportation Rights-of-Way v

Introduction 1

Opportunity With Limits 2

Framework 3

Using this Guidance 3

Step 1: Getting Started 5

Designate Project Champion 5

Organize for Action 6

Assemble Information Base 8

Step 2: Finding Partners 11

Identify Potential Partners and Their Needs 11

Determine Conditions for Partnerships 13

Enlist Participation 21

Step 3: Closing the Deal 25

Determine Compensation 27

Negotiate Partner Responsibilities 28

Delineation of Design Parameters 31

Step 4: Following Up 36

Monitor Existing Partnerships 36

Consider Future Partnership 38

Conclusion 41

Appendix A 43

Appendix B 44

Acknowledgments

This guide document was prepared under NCHRP Project 20-7, Task 76. The Task Panel consists of the same persons listed elsewhere in this front material as the AASHTO Task Force on Fiber Optics on Transportation Rights-of-Way. The report was prepared by Apogee Research, Inc., with Dr. Susan Jakubiak serving as Principal Investigator.

1996 AASHTO Subcommittee on Advanced Transportation Systems

Chairman: David R. Gehr, Virginia

ALABAMA:	Robert D. Anderson, Robert J. Jilla
ALASKA:	Joseph L. Perkins, Jim Beeson
ARIZONA:	Timothy M. Wolfe, Dick Wright
ARKANSAS:	Eric Phillips, Steve Teague
CALIFORNIA:	Wayne Henley
COLORADO:	William F. Reisbeck
CONNECTICUT:	William W. Stoeckert, Earle R. Munroe
DELAWARE:	Vacant
D.C.:	Karen G. Benefield
FLORIDA:	Jack A. Brown
GEORGIA:	Steve Parks
HAWAII:	Paul Hamamoto
IDAHO:	Greg M. Laragan
ILLINOIS:	Joseph Ligas, Joseph McDermott
INDIANA:	Dan Shamo
IOWA:	C. Ian MacGillivray
KANSAS:	Mike Crow
KENTUCKY:	David E. Smith
LOUISIANA:	Chris Orillion
MAINE:	John E. Dority
MARYLAND:	Lee N. McMichael, Michael Zezeski
MASSACHUSETTS:	Michael J. Costa
MICHIGAN:	Dr. Kunwar Rajendra
MINNESOTA:	Gary Workman
MISSISSIPPI:	Marlin D. Collier
MISSOURI:	Thomas A. Dollus
MONTANA:	William Cloud
NEBRASKA:	R. James Pearson, Kenneth J. Gottula
NEVADA:	Thomas J. Fronapfel
NEW HAMPSHIRE:	Ansel N. Sanborn
NEW JERSEY:	Jean Servideo, Kurt Aufschneider
NEW MEXICO:	Pete Rahn
NEW YORK:	Thomas C. Werner
NORTH CAROLINA:	Jimmy M. Lynch
NORTH DAKOTA:	Al Covlin

OHIO:	James E. Brenneman, Robert D. Yankovich
OKLAHOMA:	Roger Driskill
OREGON:	John Grassman
PENNSYLVANIA:	Vacant
PUERTO RICO:	Maria Dumois
RHODE ISLAND:	Joseph A. Bucci, Paul R. Annarummo, Thomas A. Conboy
SOUTH CAROLINA:	Richard F. Jenkins, Richard B. Werts
SOUTH DAKOTA:	Mike Young, David Huft
TENNESSEE:	Don Dahlinger
TEXAS:	David T. (Tom) Newbern
U.S. DOT:	Dennis C. Judycki (FHWA)
UTAH:	David Kinnecom, John Njord, Dan Julio
VERMONT:	David A. Ross
VIRGINIA:	David R. Gehr, Charlie D. Hall, James R. Robinson, Dr. Brian L. Smith
WASHINGTON:	John Conrad, David K. Peach
WEST VIRGINIA:	Robert W. Kendall
WISCONSIN:	Philip H. DeCabooter
WYOMING:	Anthony (Bud) J. Schepp

1996 NCHRP Advisory Panel 20-7, Task 76 Fiber Optics Facilities on Transportation Rights-of-Way

STATE	MEMBER
South Dakota	Dean Schofield, *Chairman*
California	Richard Bower
Maryland	Robert D. Douglass
Colorado	R. Bruce Johnson
Texas	Tom Newbern
Washington	David K. Peach
Pennsylvania	William Pickering
Missouri	Dale Ricks
Virginia	James R. Robinson
Tennessee	Mike Shinn
Iowa	Leland D. Smithson
Florida	Ken Towcimak
Vermont	Thomas Viall
Mississippi	Richard Young

Introduction

Across the U.S., public and private interests are building new communications networks on an unprecedented scale. In the public sector, for example, state and local transportation agencies are building sophisticated communications networks to support a variety of traffic and transportation management systems. These systems typically rely on fiber-optic cable, but can also call for conventional copper cable or wireless communications systems support. The private sector is also building networks, but for quite different reasons: rapid technological advances (wireline and wireless) coupled with burgeoning demand for telecommunications has prompted private communications companies to build new networks and expand existing ones.

The coincidence of these demands has spurred interest in public-private arrangements where each party taps the special resources of the other—the private partner gains access to public rights-of-way (ROW) and the public partner gains access to some form of compensation, either in-kind telecommunications facilities or service, cash, or both. Such partnerships, termed "shared resource" projects, have three distinct features:

- Public-private partnership;
- Private longitudinal access to public property (primarily roadway ROW) for telecommunications facilities; and
- Compensation to the ROW owner over and above administrative costs as identified above.

Shared resource projects also can be effected as public-public partnerships in which one of the partners is the ROW owner

and the other is another public agency that would not otherwise be able to longitudinally access the ROW for its own communications infrastructure.

Formulation of shared resource projects has been facilitated, first, by Federal Highway Administration (FHWA) delegation of authority to states to determine their own utility accommodation policies (subject to FHWA approval) and, second, by American Association of State Highway Officials (AASHTO) Board of Directors' recent resolution that recognized fiber optics as distinct from other utilities and sanctioned their longitudinal installation in freeway rights-of-way (see Appendix A).[1]

Although the opportunity to undertake such partnerships is relatively new, it is not untried. Dozens of state and local governments have already successfully negotiated shared resource ventures. Yet the process has the potential to become complicated. Therefore, this guidance, based on lessons from applied experience, is a practical overview for state transportation agencies on how to capitalize on this opportunity.

Opportunity with Limits

While shared resource ventures offer an excellent opportunity for the public sector to meet their transportation communications requirements cost-effectively, the opportunity is not without limits. The reason: shared resource ventures are market-driven. In practice, this has two implications:

- **Time:** Market conditions dictate private vendor interest in developing a partnership and the timeframe available;

- **Value:** There is no inherent value for access to highway ROW or other public property; private vendor willingness to pay for access derives from the telecommunications revenue potential for private firms, tempered by the cost of competing ROW that might be available to those firms.

Of these, timeliness is generally the more critical consideration for public agencies. If the public sector agency is slow to respond, the window of opportunity may close before a partnership is established, and the public agency may have to wait until market expansion or industry restructuring generates new demand for telecommunications capacity and, its adjunct, sites for necessary infrastructure.

[1] Telecommunications facilities have some distinct features compared to traditional utilities. For example, the equipment used is non-hazardous and non-pressurized with low maintenance requirements and long service life. In addition, because telecommunications are required for Intelligent Transportation Systems (ITS) functions, public sector telecommunications are a direct input in increasing safety and traffic operations.

Framework

As for any major project, there are distinct stages and sources of information necessary to proceed with a shared resource venture. A review of those that have been successful reveals two important commonalties:

- Each identified a leader from the start, and
- The agencies involved were willing to take informed risks.

In many cases, for example, agencies wish to have a complete set of documentation prior to proceeding. Those that were successful did not wait for all information, but instead continued forward.

In addition to these important distinctions, each successful project has four major steps, as shown in the accompanying figure on the following page.

1. **Getting Started:** the public agency organizes for action and assembles an information base.
2. **Finding Partners:** the public agency identifies potential partners and their needs, determines conditions for partnership and structure, and enlists participation via a request for proposal or some other solicitation process.
3. **Closing the Deal:** public and private partners negotiate responsibilities, delineate design parameters, and sign the contract.
4. **Following Up:** the public agency monitors current partnership(s) and looks for additional opportunities for new partnerships to continue to add value.

Using This Guidance:

The purpose of this guidance is to identify key elements involved in the implementation of shared resource projects. It is designed as an overview of the steps and activities that are typically involved in the process based on experiences of public agencies that have completed or initiated shared resource projects. In using this guidance, applicable to both freeways and other roadways, readers should bear in mind the following factors:

Four Steps to Shared Resource Projects

Step 1: Getting Started

- Designate Project Champion
- Organize for Action
- Assemble Information Base

Step 2: Finding Partners

- Identify Potential Partners
- Determine Conditions for Partnerships

Step 3: Closing the Deal

- Determine Compensation
- Negotiate Partnership Responsibilities

Step 4: Follow-Up

- Monitor Current Partnership
- Consider Future Partnerships

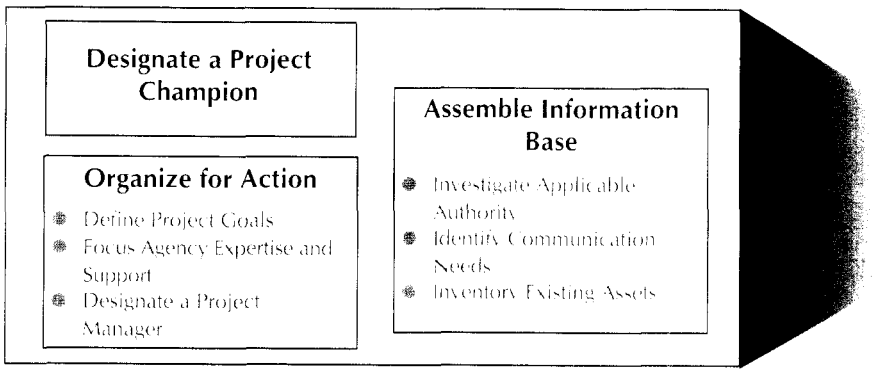
Descriptive rather than prescriptive: No single formula for implementation of shared resource projects exists. Nor is one likely, given the unique circumstances of each state and region. For this reason, this guidance is descriptive rather than prescriptive. It is intended to help public agencies interested in implementing such projects become familiar with the various aspects and issues typically involved in undertaking shared resource projects, consider the merits of alternative approaches, and select the strategies best suited to their circumstances and ultimate objectives.

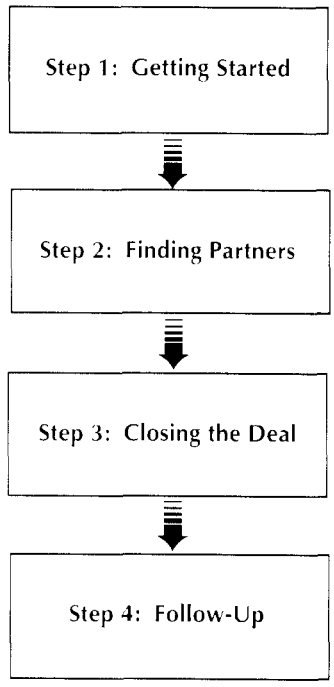
Flexible sequencing: Although the four major steps for implementing shared resource projects described above will generally be undertaken sequentially, the order of the subtasks often varies. For example, individual public agencies may undertake some sub-steps concurrently or develop a customized action agenda based on the available resources and the agency's objectives.

Importance of legal counsel: The Telecommunications Act of 1996 may significantly influence the implementation of shared resource projects across the country. Although this guidance refers to some potential implications of the Act, it is important to recognize that the complete implications of the Act for shared resource projects are as yet unknown. Public agencies are advised to explore carefully potential ramifications of the Act for shared resource projects, track Federal Communications Commission (FCC) rulings and clarifications[2] and, from the outset, incorporate legal counsel such as the state's Attorney General's Office or private consultants.

[2] The appendix to this guidance groups relevant sections of the Act according to "urgency" with regard to shared resource projects.

Step 1: Getting Started





This chapter presents the process for one of the most fundamentally important steps in developing and successfully deploying a shared resource telecommunications venture: setting the stage. Activities fall into three groups:

1 Designate project champion;

2. Organize for action;

3. Assemble information base.

Once the component pieces are in place to the satisfaction of senior management, it is possible to proceed with procurement, contracting and construction. As will be discussed in later sections, the level of detail and completion necessary for each varies, depending on the local circumstances, the urgency of the requirement, and the technical capabilities of the agency itself.

Designate Project Champion

One of the most important lessons from dozens of case studies of successful (and unsuccessful) shared resource initiatives across the U.S. is that the complex and challenging context for this work requires a "project champion" — a single individual with authority and stature who spearheads the effort by: identifying institutional and statutory hurdles, developing consensus and support for shared resource projects, and mobilizing resources within the public sector.

"Typically, it takes approximately 12-18 months from the time a shared resource project is conceptualized to the groundbreaking for actual construction."

This individual is not solely responsible for reconciling conflicts nor for defining the project goals. Instead, the champion is a facilitator who helps to mobilize and organize resources within the agency to organize for action and assemble the necessary information as described in greater detail below. To succeed, the project champion must have high-level support, ideally from the agency's top leadership such as the Chief Administrative Officer or the Chief Engineer.

Organize for Action

Shared resource projects are relatively new to the public sector and agencies are not yet geared to achieving these partnerships efficiently and on the kind of expedited schedule that private partners want. Organizing for action therefore includes the following steps:

- Define project goals;
- Focus agency expertise and support;
- Designate project manager.

Define Project Goals

The first responsibility of the Project Champion is identification of broad goals for shared resources. These goals can change and be refined over time. However, it is important to start with a baseline goal for the process that identifies:

- Primary goal (or goals) for a shared resource venture, such as adding telecommunications capacity or receiving cash payments, and
- Projected project start.

In most cases, it may also be necessary to specify separate goals for wireline shared resource ventures as well as wireless ventures, as the two markets are unique both in terms of their goals and timing. The goal may be as simple as:

> *"...negotiate shared resource projects to support toll collection systems within the next year."*

or more complicated, such as:

> *"...develop partnerships with private telecommunications interests to support department transportation management telecommunications needs, including wireline systems to support real-time video and wireless systems to facilitate management of variable message sign deployment, within the next 6 months."*

Even though many agencies are not familiar with their telecommunications needs at project outset, it will certainly be possible to set out preliminary goals against which future ideas and objectives can be tested. The time component, whether explicitly stated or not, however, is particularly important since the overall potential for a shared resource venture is determined by market forces outside of the control of the agency. Having a target for success will help the agency measure its progress relative to a rapidly changing marketplace.

Focus Agency Expertise and Support

The Project Champion is responsible for organizing the technical committee within the agency, preparing the agenda, and executing that agenda. Potential interests from across the agency may include:

- Finance (including those with expertise on public-private ventures),
- Legal,
- Intelligent transportation systems/telecommunications,
- Right-of-way,
- Procurement, and
- Engineering/construction.

"In general, public agencies are not used to operating in a business context which might become a liability during the implementation of shared resource projects. Ensure that personnel well-versed in business issues such as level of compensation and negotiation are included in the team."

Once the team is assembled, two steps are necessary. First, the Project Champion must educate the technical committee on the background and potential for shared resources. To that end, existing research and outside expertise (communications or business consultants, for example) may be brought in to further substantiate the agency's position and potential for success. Outside expertise may also bring the added advantage of accelerating the education of key interests and reducing the time required to proceed.

Second, the technical committee must agree on the goals for a shared resource venture. Because agreeing to allow access to the right-of-way is unusual for many agency interests, this often requires the demonstrated commitment by high-level agency interests such as the Chief Administrative Office or Chief Engineer through presence at one or more of the technical committee meetings. Ideally, the CAO/CE can be present for the debate and resolution of goals.

Designate Project Manager

Public agency bureaucratic procedure can be daunting to potential private partners. Moreover, time is critical to achieving successful shared resource projects. For these reasons, it is important to designate a project manager or "point person" for shared resource projects — a single individual within the agency who is charged to develop and execute a shared resource project and who likewise has the authority and responsibility to carry the project through to its completion. This person, who may or may not be the project champion, is the sole point of contact or liaison with potential private partners and is the person who shepherds private vendor proposals through the inter- and intra-agency bureaucracy to obtain permits, design approvals, and the like.

Such focus is necessary to ensure that the initiative does not become lost among the many individuals and interests that inevitably become involved and that the understanding of the technical and non-technical issues can reside in a single agency expert capable of identifying the various and potentially conflicting needs of the agency.

Ultimately, the steps in Organize for Action culminate with establishment of "one-stop shopping" where the project manager is the point of contact for all potential private partners — applicants deal only with the manager, who coordinates the process and permitting activities on the public sector side.

Assemble Information Base

The final step for the Project Champion is to assemble technical and non-technical information relevant to shared resources. In certain cases, this will be simple. For example, many states have already developed a state-wide vision for intelligent transportation systems that includes (explicitly or implicitly) telecommunications requirements necessary to support full deployment of those systems. In most cases, however, this work will be new to the agency and much of it will be specific to the state, such as legal interpretation of the state's accommodations policy—the document that describes limitations to access to state rights-of-way.

Like the project goals, however, this information does not have to be complete or definitive to begin the process. In fact, no agency that has undertaken a shared resource venture has had all possible information at the start — many have gone forward and succeeded without it in order to avoid missing an opportunity to undertake a shared resource venture.

Information collection to support project development includes:

- Investigate applicable authority;
- Identify public agency communications needs;
- Inventory existing assets available for shared resource projects; and
- Evaluate existing assets.

Investigate Applicable Authority

The agency should investigate several legal and statutory aspects that pertain to shared resource projects. These include: authority to grant longitudinal access (and the authority to restrict access) to public property including right of way for private equipment installation and use; authority to receive compensation (cash and/or barter); authority to earmark distribution of the compensation received.

Once formulated and approved by the Federal Highway Administration, the state's Utility Accommodations Policy will state the types of utilities that may be granted longitudinal access and the conditions which govern such access.

Identify Communications Needs

Shared resource projects can generate compensation as cash revenues or in-kind equipment and services. Before the agency formulates their policy on compensation, they must identify their existing and potential communications needs, that is, those communications needs that would justify seeking some form of in-kind communications as compensation for access. This list can be general and approximate; it does not need to list specific types of equipment and precise locations for each communications activity.

Inventory Existing Assets

It is important that both public agency and potential private partners know what public property may be made accessible to private activities. This means that the public sector must attempt to inventory existing assets from the standpoint of the telecommunications interests, including controlled access right-of-way for fiber optic cable or right-of-way or properties in general for wireless communications facilities (i.e., towers and antennas). Available assets do not necessarily include all

Sources To Identify Communication Needs:

- Existing telecommunication demand and projected needs
- State's ITS Vision/Plan
- Map of resources:
  - ROW available for wireline
  - Property and ROW available for wireless

"Other ROW such as railroads and non-operating gas pipelines can provide significant competition."

property used for transportation since the conditions under which that property was acquired may affect its availability, for example, property acquired by condemnation might not be available for private sector purposes under some state statutes.

Evaluate Existing Assets

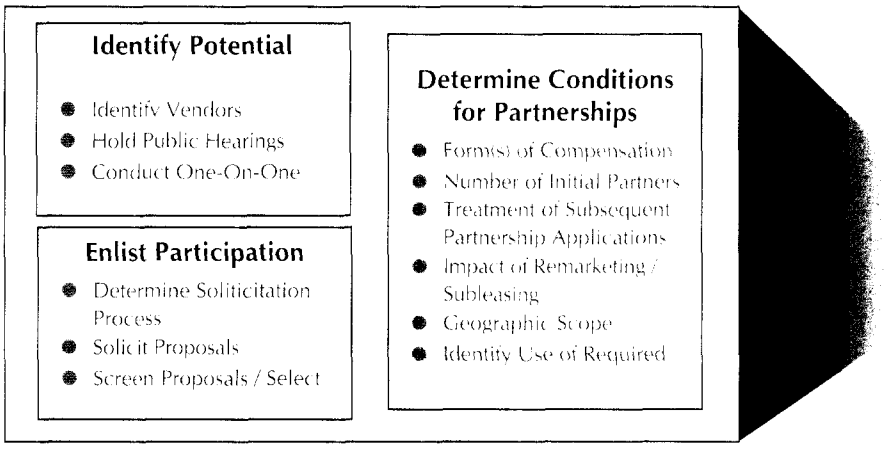
The public agency should seek to estimate the market value of its property, that is, the assets to be shared with the private sector, to ensure that the agency is fairly compensated. Although it is difficult, and sometimes almost impossible, to determine the precise market value of the property, there are six ways to estimate ROW value for either wireline or wireless facilities. These include:

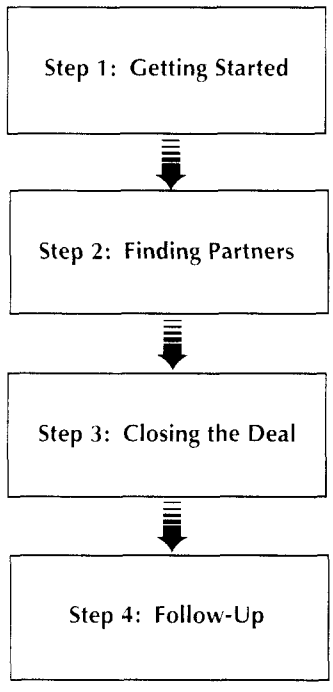
- Competitive auction: high bid(s) in competitive bidding situation assumed to reveal market value of access to public property;
- Valuation of adjacent land: proximate real estate values used a guide to value of highway ROW and other public property;
- Cost of next best alternative: cost of communications infrastructure on highway ROW or other public property compared with total cost of next best alternative site (installation plus access and transactions costs using privately held parcels, railroad or utility ROW, etc.);
- Needs-based compensation: target level of compensation for barter compensation based on public sector communications needs (rather than independent estimates of private willingness to pay or market value);
- Historical experience: data on documented shared resource and commercial lease agreements used as guide to value of access to public property, adjusted to account for differences in property characteristics; and
- Market research: potential private sector partners are contacted to determine interest, partnership conditions, and approximate willingness to pay.

Aside from competitive auction, which may or may not elicit bids at "full market value," no single approach will yield a completely accurate right-of-way value. Several approaches used simultaneously will better pinpoint the range within which market value falls.[3]

[3] For a concise summary of the pros and cons of each valuation approach, see USDOT Guidance on Legal and Technical Issues, cited above. For a more detailed discussion of factors that affect valuation, valuation approaches, and historical data on shared resource project compensation, see USDOT Identification, Review and Analysis of Legal and Institutional Issues, cited above.

Step 2: Finding Partners





The first step for shared resource projects, "Getting Organized", includes activities that focus inward — preparing the agency for a shared resource project by organizing the personnel, resources, and supporting information. The second step focuses outward, on bringing private sector partners into shared resource ventures. Three basic steps are involved in finding partners:

1. Identify potential partners and their needs,
2. Determine conditions for partnership, and
3. Enlist participation.

Steps 2 and 3 signal a paradigm shift in addressing transportation needs because they emphasize a collaborative approach rather than the more traditional procurement process. For example, mutual exchange of information is an important component in Step 2.

Identify Potential Partners and Their Needs

Whether private vendors approach public agencies on their own or public agencies initiate the process of exploring shared resource projects, public agencies can benefit from systematic

outreach to potential private sector partners because a competitive environment can increase the ultimate value of the project. And, given the public sector's responsibility to encourage a competitive climate as well as provisions in the Telecommunications Act of 1996 mandating non-discrimination and no barriers to entry, it is important that public agencies energetically advertise the opportunities available and actively solicit private sector input.

Outreach includes three basic activities:

- Identify vendors who are potential partners,
- Hold public meetings, and
- Conduct one-on-one meetings.

Identify Vendors

Although a number of public agencies have been approached by interested vendors concerning access to public ROW, public agencies should nonetheless actively identify all potential partners both because (1) competition among vendors and/or developing partnerships with several vendors will maximize public sector benefits from shared resources and (2) systematic outreach will ensure non-discrimination among vendors.

There are several ways to identify potential partners and all should be pursued:

- Contact the state's Public Service/Utility Commission to identify telecommunications providers already active in that state.
- Place ads in appropriate telecommunications and ITS trade journals, which will reach potential partners not already active in that state as telecommunications providers as well as vendors that are telecommunications resellers rather than retailers/utilities.
- Review public sector RFP distribution lists for communications and ITS procurements to identify interested vendors that might be missed in the first two steps.

Hold Public Meetings

Public meetings, to which all identified potential partners are invited, are a vehicle for the public agency to officially publicize its position — to express its interest in public-private partnerships, acquaint potential partners with public sector

program on shared resources, and solicit input on private vendor needs. At this meeting, the agency presents the results of "Getting Organized," that is, project goals, relevant information and policy statements, and the contact person for interested vendors. The agency also should encourage attendees to express their views on shared resources, ask questions about the proposed program, and describe their interests so that projects can be responsive to vendor needs.

Conduct One-on-One Meetings

Even vendors that actively participate in the general meetings may not fully reveal their specific interests in an open forum that includes competitors. Thus it is important to conduct one-on-one meetings for a mutual exchange of information; such meetings will help the public agency to fully elicit concerns, identify needs and conditions for partnerships, and hear comments on shared resource projects. There may or may not be a consensus among potential partners but, under either circumstance, the agency will achieve the greatest vendor participation if the proposed program is responsive to vendor needs with respect to site(s), project size, types of compensation, and other project issues.

In light of the importance of arm's length relationships between public agencies (ROW owner) and private firms that may later be involved in a competitive bid selection process, the public partner may find it advisable to retain a consultant or other third party to contact potential private partners on its behalf.

Determine Conditions for Partnerships

These conditions define terms of the relationship between public and private partners and the context within which the partnership operates. Public agencies often have more than one option for specific partnership conditions. The options selected can be a function of vendor preference (as revealed through the preceding activities), agency needs and policy decisions, and/or legal and technical constraints that limit agency choices. Since these conditions may affect partner interest, several issues must be addressed and articulated as agency policy before partners are selected:

- Form(s) of compensation
- Number of initial partners
- Treatment of subsequent partnership applications
- Re-marketing and sublease conditions

- Use of design standards and guidelines
- Geographic scope

Form(s) of Compensation

Shared resource projects by definition involve compensation over and above administrative costs to the ROW or public property owner; the form that compensation takes can be goods and services, cash, or a combination of both. The choice is determined by: (1) legal restrictions on cash revenues and/or control of receipts by public agencies, (2) public agency need for communications infrastructure and services to support transportation, (3) private partner and public agency preferences.

If the public agency can receive cash and earmark such receipts for its own needs, cash receipts have the advantage of full flexibility — that is, they can be allocated among activities according to need or banked for future needs. Barter, on the other hand, has the advantage of being automatically earmarked for agency use (assuming no legal requirements to open up the communications infrastructure to statewide administration). Barter also enjoys a strong advantage because cost to the private partner of expanding communications infrastructure or providing service is generally less than value to the public partner of such compensation (i.e., the avoided cost). Thus, the public sector may receive barter compensation that is worth more to the ROW owner than the cash that might have been paid.

Barter can also be somewhat flexible. It can, for example, take the form of compensation through services that can be used anytime over a stated time period or infrastructure to be specified and installed at a future date (specified in dollar equivalents but not specified with respect to technical specifications when the contract is signed).

Barter options are quite flexible, and, within reason, are only limited by the goals and ideas of the public sector. A sample of options for barter compensation that have been negotiated or discussed for each of the major communications project types includes:

- Wireline projects: fiber optic conduit, inner ducts, and/or dark fiber; equipment to "light" the fiber; equipment maintenance and/or upgrading; operations of communications equipment; future upgrades; cost-free or reduced fee communications service on private vendor system; redundancy on private partner's system.

"For the sake of administrative ease and speed, consider limiting in-kind compensation to conventional cellular support since the agency may already be spending significantly on annual cellular charges."

- Wireless projects: space on private towers (on public or private property) for public sector equipment; installation of public sector antennae; construction of equipment sheds and installation of support equipment; back-up service or redundancy; wireless call box installation; cost-free or reduced fee communications services on private system.

Some feel that in-kind compensation involving communications equipment is easier to achieve for wireline shared resource projects than wireless because wireline projects are more extensive and cover a wider geographic territory whereas wireless projects tend to be very site specific. This means that private partner infrastructure is more likely to coincide with public sector equipment needs in wireline projects, where there are multiple access points and the same fiber that runs from point A to point F can also be tapped to serve needs at intermediate points. And, that fiber can be in the ground even before public sector needs are pinpointed so long as there are sufficient access points to tie in at a later date wherever needs are identified.

"Think in terms of multi-media networks: voice, video and data. Avoid being confined to single medium."

It is true that opportunities for in-kind compensation involving physical equipment may be limited for wireless projects that are negotiated one site at a time. However, barter can also be effected fairly easily for wireless as well as wireline projects. First, a wireless context comparable to that for wireline projects can be achieved if the private and public partners negotiate multiple wireless sites simultaneously so that they form a "system" offering a choice of sites for in-kind compensation now or later on in the partnership. Second, public partners can be compensated in kind with capacity on other towers in the private system, i.e., not on the shared resource site. Third, as noted, free or reduced cost service is a barter option, although different vendors have differing interests in negotiating such service.[4]

However, both wireless and wireline barter arrangements are beneficial only if the public agency has identified unfilled communications needs. And, this means that the public agency must identify its communications needs, at least in general terms, prior to developing partnerships.

[4] In New York, for example, a wireless vendor was willing to provide services at low or no cost as part of the arrangement. On the other hand, one of the vendors interested in Virginia ROW strongly preferred cash transactions.

Number of Initial Partners

Public ROW owners can partner with one or several private firms, and there are a number of basic formats. Most formats are expected to be considered compliant with the Telecommunications Act of 1996; public agencies should, however, keep abreast of FCC and court decisions and, from the outset, consult with their legal counsel. Basic formats include:

- Multiple partners, fixed-fee lease payments; *compliant.*
- Multiple partners, varying cash or in-kind lease payments negotiated on individual basis; ***probably compliant*** so long as differences in compensation are related to differences in conditions.
- Single partner, selected on competitive basis, who intents to re-market or sublease capacity or otherwise accommodate other communications providers; ***probably compliant*** so long as primary tenant charges "fair market prices" for others' access to infrastructure.[5]
- Single partner, selected on competitive basis, who does not provide physical capacity or infrastructure to others but does provide band width or services on a wholesale basis; ***possibly compliant*** but unknown at this time.
- Single partner operating installed capacity exclusively for own business; ***possibly non-compliant.***

Some public agencies form partnerships with any and all vendors that are willing to meet agency conditions. For example, the Ohio Turnpike leases longitudinal access to its ROW to all interested communications firms that want to lay fiber optics for a set fee per mile per year ($1,600). Thus, on any given ROW, there may be several vendors accommodated. Similarly, New Jersey Department of Transportation will, to the extent physically possible, accommodate all requests for access for wireless communications infrastructure along its ROW and on its buildings or other department of transportation (DOT) real estate. Some agencies, such as Maryland and Massachusetts, have applicants form consortiums or prime contractor-subcontractor relationships to accommodate multiple vendors with only one point of contact for the public agency.

[5] Re-marketing and subleasing, as used in this guidance, refer to a primary partner's arrangements with other telecommunications service providers who contract for access to physical infrastructure installed and owned by the primary tenant such as fiber optic conduits or inner ducts, towers for wireless antennae, etc., in order to install their own equipment, or who contract for long-term (exclusive) use of primary tenant infrastructure such as fiber optic strands. Subleasing is used as a general term for the contractual relationship between the primary tenant and secondary tenants, regardless of whether the primary tenant is granted access through a license, franchise, or lease with the public ROW owner.

Other agencies prefer to select a single partner for each specific project. The Telecommunications Act of 1996 clearly may rule out selecting a single partner to construct and operate a physical monopoly, i.e., providing longitudinal access to ROW to one firm for its own use to the exclusion of all competitors.[6] It is likely, however, that subsequent FCC regulations and court decisions will sanction selection of a single partner to manage a marketing monopoly where the partner is chosen in a non-discriminatory manner and no barriers to entry by competitors are erected, i.e., one firm selected through competitive bidding that acts on behalf of the public agency or itself to re-market telecommunications capacity at fair market rates to all interested firms.

Single-partner relationships with wireless telecommunications service providers may be impractical for the simple reason that these firms generally want access to very specific sites and these sites constitute only a fraction of the public agency real estate available for such infrastructure. Contracting with a single such partner would unduly limit public sector partnership options. Public interest would be better served by contracting with as many wireless vendors as possible or by contracting with a single construction-marketing agent that works with all private communications vendors.

"One potential problem with co-location is that the major vendors want physical exclusive equipment and infrastructure and may not want to share the vaults or conduits with others. Propose construction of separate inner ducts. For example, a common main vault open to all partners with separate inner-vaults to which only a specific partner has the key."

Treatment of Subsequent Partnership Applications

After the initial partnerships are formed and even after the projects are constructed, other vendors may apply for shared resource partnerships. The agency must decide whether to accept new partners and, if so, how to deal with subsequent applications. There are several options:

- **One time window of opportunity:** Applications are only considered during stated time period defined by the public agency; no subsequent applications will be considered.
- **Limited window of opportunity with potential re-opening:** Applications are considered during stated time period defined by the public agency; post-deadline applicants must wait until the agency decides on another window of opportunity.
- **Open application period:** Applications are considered whenever received, subject to physical capacity constraints.

[6] Exceptions may be made for rural utilities that are protected from competition in the interests of supporting universal service in low density, high cost areas. Future FCC rulings and interpretations will determine if and under what conditions, physical monopolies for other telecommunications providers are compliant.

Approach	Pro	Con
One-time window of opportunity	Imposes time limit on administrative involvement with partner selection; construction on specific ROW segments minimized by installing infrastructure at one time.	Total number of partners and therefore total compensation to public agency may be restricted; possibly interpreted as barrier to entry.
Limited window of opportunity	Imposes time limit on administrative involvement with partner selection; construction on specific ROW segments minimized by installing infrastructure at one time; allows expansion later at public agency's discretion.	Total number of partners and therefore total compensation to public agency may be restricted; possibly interpreted as barrier to entry, though planned "reopening" of window may address barrier issue.
Open application period	Clearly a non-discriminatory and no-barriers approach; probably enhances total compensation received by public agency.	Extends period of construction/installation on ROW, thus poses safety concerns and danger of damage to existing infrastructure; ongoing administrative burden.
Planned excess physical capacity	Easy to accommodate subsequent applicants without disruptive construction on ROW.	Can impose some financial burden on initial partners (though costs of incremental capacity are a fraction of total costs); may discourage primary tenant(s) if perceived as threat to their customer base (diversion of demand to subsequent applicants).

"In master lease, specify how first tenants must permit access by subsequent tenants under certain lease terms and rates, subject to physical capacity. For example, specify that first tenant must construct a facility that is physically capable of supporting at least 2 additional vendors"

- **Planned excess capacity:** Initial construction includes excess physical capacity (conduits, inner ducts, dark fiber), which is available for subsequent applicants on a cost-reimbursement or fair-market lease payment basis.

All of these approaches have been used. The pros and cons from the public agency point of view are summarized in the table above.

Subsequent applicants may want access to the same property already occupied by initial partners or to property not involved in existing projects. For both wireless and wireline projects, adding new partners to existing projects may require additional capital investment — for wireless: reinforcing towers, building new or expanding existing equipment sheds; for wireline: laying new conduit, pulling inner ducts or fiber through existing conduit. Given the safety issues and expenses of re-opening wireline trenches or plowing in new conduits and fiber, planning how to deal with subsequent applicants is probably more important for wireline partnerships than wireless.

Impact of Re-marketing/Subleasing

Generally, private partners assume full responsibility for re-marketing and subleasing capacity in conduit, inner ducts, or on towers in shared resource projects. Such efforts enhance their revenue from the project and ensure non-discrimination and no barriers to entry, that is, compliance with the 1996 Telecommunications Act. Under the terms of many shared resource partnerships, public agencies also have a direct interest in re-marketing or subleasing because their compensation is tied to the success of those efforts in one or both of two ways:

- Construction gets underway only after planned capacity is successfully subleased, for example, in the NY Thruway project. That is, communications infrastructure — both public sector and private — will be constructed only after a targeted level of subleases have been negotiated (with limits on how long construction can be postponed).

- Public agency cash compensation is based in whole or in part on sub-lease revenues. For example, under the terms negotiated by NJ DOT, the DOT receives half the revenue when its wireless partner(s) sublease space on their towers to other wireless providers (sublease rates for sublessees are the same as stated in the master lease for the primary tenant).

Although contract negotiations will determine whether or not compensation is affected by re-marketing efforts, the ROW owner should explore the basic options in advance so that officials are aware of the benefits and implications of different approaches. Public agencies should be aware, however, that their pro-active participation in re-marketing of capacity, subleasing and/or involvement in revenue determination may be construed as acting as a public utility, thus conferring both the benefits and compliance responsibilities associated with public utilities in that particular state.[7]

Use of Standards and Adopted Guidelines

Since many of AASHTO's guidelines and other standards were prepared prior to the widespread development of telecommunications and shared resource opportunities, these materials may not directly address the needs of these projects. Care should be taken in application of the standards which may not

[7] Some have postulated that public ROW owners could be classified as public utilities if partnerships involve revenue sharing, that is, the public partner's compensation is proportionally related to sublease revenues rather than a fixed "tariff" rate. This may depend on what is being subleased, that is, whether it is considered real estate (tower site, inner duct) or communications services, and whether compensation is based on a standard rate schedule or negotiated individually for each sublease.

be oriented toward shared resource projects. In fact, some standards and specifications now used may contradict or preclude shared resource projects and changes or deviations can be the subject of the negotiation process. The following concerns should be kept in mind:

- Safety considerations should always be emphasized — e.g., protecting clear zones, preserving sight distances, regulating construction zone safety, etc.

- Geometric standards that may not directly effect safety but could permit accommodation of telecommunication facilities such as longitudinal location of wireline equipment in the median, shared maintenance zones and facilities, etc., may be negotiated.

- Administrative guidelines which may constrain the negotiation process and restrict the opportunity for shared resource projects should be subject to the negotiation process.

Adopted standards and guidelines can be modified, with care, to make the shared resource project beneficial to all users. Use of the appropriate processes to make modifications which recognize the advent of telecommunications shared resources projects, should be brought to the attention of the decision makers both prior to and after negotiations.

	Factors to Consider	
Geographic Scope	**Wireline Projects**	**Wireless Projects**
Large Scope	Requiring a large scope can allow the agency to leverage ROW segments most desired by private partners to obtain infrastructure for public sector along more extensive ROW; reduce chance of gaps in public sector backbone. This may, however, discourage smaller vendors as direct partners, though they can sublease from primary partners.	Requiring a large scope may not be possible and may discourage partners: cellular vendors are not generally interested in full system, only filling in (increasing density) on established systems; PCS vendors interested in full systems but are still geographically focused on urbanized areas. Therefore, emphasis should likely be on making large scope available.
Small Scope	Defining a small scope encourages smaller vendors to participate. Large vendors may then seek to apply for several projects to achieve full system, but may also be discouraged if only one partner picked each project, adjacent projects are not forthcoming at same time. May leave gaps in public sector backbone.	Single site projects may encourage partnerships because projects are responsive to vendor-specific needs, but may not be deemed attractive enough to merit respective public and private investments in process to succeed.

Geographic Scope

The geographic scope of an individual shared resource project can be extensive, perhaps even the whole state's interstate system. Or, it can be confined to a single parcel of real estate, for example a short segment of ROW between two interchanges, a single bridge structure, or a DOT maintenance facility yard. The public agency can actively define project scope — and may even wish to require proposals to match that scope — based on policy and practical considerations. It can also passively let each private partner define the geographic boundaries of their projects. Considerations of geographic scope differ between wireless and wireline projects.

Continuity problems or gaps that may be associated with smaller projects can be of two types:

- Physical continuity, that is, there are gaps in the public sector backbone provided by in-kind compensation because not all ROW is included in shared resource arrangements; and

- Technical or electronic continuity, that is, the public sector system provided through in-kind compensation is eclectic mix of interfaces and technologies because each project has a different private partner or partners, each offering different compensation or physical infrastructure.

Enlist Participation

The culminating activity of Step 2, Finding Partners, is actually enlisting vendor participation in shared resource projects. There are three steps:

- Determine solicitation process;

- Solicit proposals;

- Screen proposals/select partners.

Determine Solicitation Process

There are three basic solicitation processes currently used by public agencies engaged in resource sharing: competitive bid, master lease, and vendor initiative.

- Competitive bid: Public agency issues Request for Proposals to solicit potential partners' "best bid" for conditions and compensation.

"...RFP should be structured to present information on each topical focus such as: contract provisions, marketing and technical specifications. Commingling may lead to confusion and miscommunication..."

- Master lease: Public agency formulates template that specifies lease conditions and compensation levels for varying types of shared resource partnerships.

- Vendor initiative: Interested vendors submit proposals to public agency indicating property or ROW to which they want access, infrastructure they intend to install, and type and level of compensation offered. These proposals may be unsolicited, i.e., without prior public sector outreach, or in response to public agency solicitation.

Each approach has several distinguishing features, but variations are possible within each type.

Solicit Proposals

It is in the public agency's best interest to reach as many potential partners as possible, not only to ensure non-discrimination but to elicit the best possible offers for partnerships. This can be achieved by contacting potential partners directly, using the list of potential partners generated in the first stage of Finding Partners. It can be enhanced, if necessary and

Dimension	Competitive Bid	Master Lease	Vendor Initiated
Time deadline	Yes	Can be indefinite or limited time period for applications	Can be indefinite or limited time period for applications
Geographic scope (ROW segment, property sites)	Defined by public agency or by private vendor.	Generally public agency identifies available property or ROW and partner selects.	Defined by partner(s).
Systematic publicity and outreach	Yes	Generally, though process may be developed after vendor initiative.	Not necessarily.
Suitable for single partnership	Yes	No	Only with post-submission outreach to other potential partners to solicit reaction (ensure non-discrimination).
Form of compensation	Open or agency specifies.	Generally cash, but may include barter.	Vendor specifies, though agency can indicate preferences.
Level of compensation	Vendor determines, but agency can specify minimum acceptable bid.	Agency specifies, with some flexibility to adapt to individual circumstances (e.g., volume discounts).	Vendor determines, but agency has greatest negotiating flexibility to enhance value.

time permitting, through additional publicity in trade journals and newspapers. If competitive bidding is involved, then an RFP must be written and distributed.

Publicity and RFPs may be very general, indicating the public agency's basic interest in shared resource projects and general policy decisions. Or, they may be very detailed, with a list of public sector communications needs that barter agreements might address and a complete inventory of public property available for sharing. Private partners have indicated their strong interest in prior information on available property so they can determine which of their needs might be supported with shared resource partnerships. This was especially true for wireless vendors whose interests are site-specific and include non-ROW property as well as ROW.

"...Although the RFP should solicit innovative ideas, the public agency may consider indicating preferences, such as preference for a co-location arrangement with one firm as lead at each site and others given access on specified terms..."

Screen Proposals/Select Partners

Several principles are paramount in screening and selecting partners:

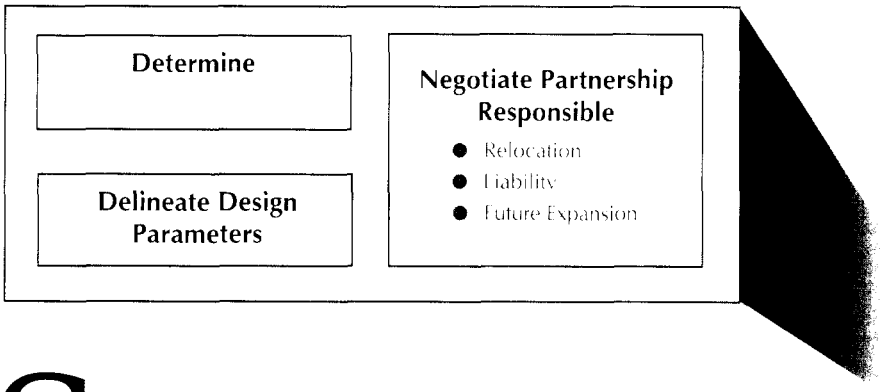
- Ensure no discrimination among potential partners/competitors in selection or partnership terms;
- Erect no barriers to entry;
- Support public agency policy objectives.

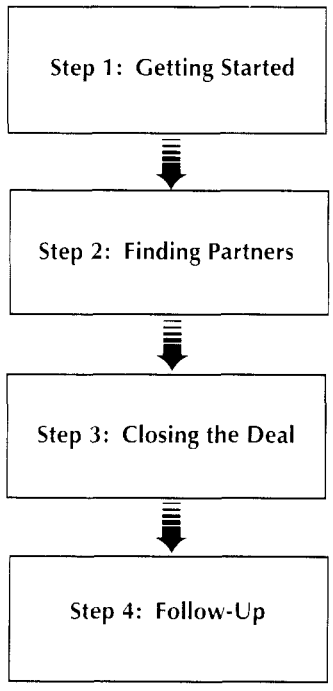
Under the master lease approach, the process is straightforward: all proposers that meet technical specifications and offer the required level of compensation are accepted. With vendor initiatives, post-submission publicity and solicitation may be necessary before a partnership is approved unless all vendors can be accommodated.

The competitive bid process can produce a single winner, based on pre-specified system of screening, or several partners with "responsive" bids. Since all interested parties are free to bid and selection criteria are announced in advance, most would argue that the process is non-discriminatory. Some might argue that rejection of low-bidders constitutes a barrier to entry but most believe the process is acceptable, particularly if winning bidders are pledged to accommodate competitors through sub-leasing.

Under all three approaches, screening and selection is complicated when there are variations among bidders in project specifications and compensation. Selecting the winning bids, for example, becomes difficult when one vendor offers cash compensation, a second vendor with a different project offers barter compensation, and a third offers

Step 3: Closing the Deal





Steps 1 and 2 focused on laying the groundwork for shared resource projects, including strategies on how to find partners. Once the groundwork is complete and the key partner(s) identified, the next logical step in the process is to work toward a formal agreement on how the partnership will be executed. The culmination of this effort is a signed contract that codifies the partnership relationship. This section of the guidance provides an overview of selected key issues that are addressed in the process of closing the deal.

Basically, closing the deal has two phases. The first is the negotiation phase, when the public and private partners work to achieve consensus on issues related to compensation, allocation of responsibilities among partners and the specification of design parameters. Step 3 culminates in the second phase when final contract is prepared and signed by both parties after a detailed review of the terms and conditions set forth in the contract document.

A review of contracts across the country for completed and ongoing shared resource projects indicate that there is no fixed contract format. Rather, contracts are customized to fit the needs of individual projects and reflect the consensus reached by the public and private partners. However, the following three general themes or principles emerged from discussions with various public and private partners.

"Develop a 'model' contract incorporating compensation and technical specifications. Use this model for each individual site or for future partnerships to increase vendor participation without the long ordeal of going through negotiations from scratch each time."

Comprehensiveness: Comprehensiveness ensures that the final contract covers all relevant details and dimensions affecting the partnership. To the extent possible, the contract should identify and address all factors and situations that could bear on the partners' business relationship. By eliminating gaps, the contract minimizes the chance that the partnership is stymied in the future because partners cannot agree on how to address an unforeseen development. For example, the contract should address allocation of responsibility among the partners regarding accidental damage to telecommunications equipment.

Specificity: Attention to specificity means that the particulars of the partnership agreement are clearly defined and the potential for misinterpretation and misunderstanding is minimized. For example, due to the evolving nature of the telecommunications industry, it may be necessary to review the original contract at fixed time intervals. Specificity suggests that the contract explicitly schedule the intervals at which contract reviews can be undertaken in addition to defining the length of the overall contract period (which can range from 5 to 40 years).

Flexibility: Flexibility helps the partners adapt to unforeseen and changing conditions related to technological advancement and future communication needs. For example, in a barter arrangement, built-in flexibility in the contract may allow partners to have the ability to adapt to new technological advancements that is more cost-effective and efficient than the original equipment. For example, flexibility may be achieved by having the contract define processes for addressing issues rather than prescribe exact terms that are fixed throughout the term of the partnership.

These three principles, however, can work at cross-purposes and there are logical trade-offs among them. For example, flexibility can be eroded by specificity in the contract and vice-versa. Therefore, it is important to carefully evaluate the consequences of the potential trade-offs in light of the overall project goals to ensure that the final contract reflects the needs and expectations of both partners. For example, in negotiating in-kind compensation, there is greater need for flexibility and a lesser rationale for specificity when public officials have only a tentative estimate of their current and future communication needs (as estimated in Step 1 of the project implementation process). On the other hand, if public officials are confident of their estimates of communication needs, it would be logical to adopt a greater degree of specificity than flexibility in the contract.

The balance of this section summarizes three major activities typically included in the contract negotiation phase:

- Determine compensation level and type.
- Negotiate partner responsibilities, and
- Delineate design parameters.

When negotiation is completed and consensus achieved, a contract is drawn up and signed and implementation of shared resource projects moves into Step 4: Following Up.

"For barter arrangements, in general, vendors are reluctant to provide equipment they are not going to use such as CCTV cameras, VMS, and are more open to supplying cellular towers or fiber optic cables."

Determine Compensation

Compensation may be set in previous steps, for example, as part of a master lease that specifies cash payments or as in-kind equipment that a vendor bid in its winning proposal for an exclusive marketing partnership. If compensation was not determined in previous steps, it must be negotiated as part of closing the deal. Partners must review and achieve consensus on three aspects:

Form of compensation: that is, the partners' choice among three basic options: strict barter (e.g., communication equipment such as fiber optics fibers and support electronics equipment), cash-only (e.g., periodic lease payments) and a combination of barter and cash (e.g., communication capacity and periodic lease payments).

"...Attempt to estimate cash equivalent values for in-kind compensation to ensure the agency is getting fair market value for the ROW."

Level of compensation: that is, the amount or basis for determining cash revenue (e.g., fixed level of dollars per mile) or, for in-kind compensation, the amount and type of communications capacity (e.g., amount and type of data carrying capacity of the communications facilities).

Compensation schedule: that is, the timing of cash payments (e.g., monthly versus annual lease payments) and/or installation schedule for in-kind compensation (e.g., six lighted fibers by the end of the fifth year at one capacity type, upgraded to higher capacity any time after the 10th year, etc.)

Partners should also decide whether compensation type and level remain the same throughout the contract period or whether they will change over time as the market for communications services matures and as transportation needs change. Compensation schedule should include not only the timing for payments but also the milestones or conditions that trigger adjustments in compensation.

Negotiate Partner Responsibilities

The second set of issues the public and private partners need to negotiate and arrive at consensus involve the distribution of responsibilities among the public and private partners. This is important since the allocation of responsibilities among partners may have a direct effect on private sector willingness to pay for access to ROW. Three major areas of responsibility include:

- Relocation of communications infrastructure,
- Liability in case of accidents and/or damage, and
- Future expansion.

Relocation

Communications infrastructure may need to be relocated to some other place on the ROW if the public sector undertakes highway improvement projects such as road widening and resurfacing or the installation of new transportation management facilities within the existing ROW. The issue here is who assumes management and financial responsibility for moving public and private communications infrastructure — conduits, inner ducts and fiber, equipment sheds, towers and antennae, etc.

Traditionally, when a utility was granted access to public ROW, franchise law provided that the utility was responsible for relocation costs. This was based on the argument that the utility did not compensate the public sector for the use of the ROW. However, this argument may no longer be valid for shared resource projects if private partners compensate the public agency for use of the ROW. Additionally, the historical definition of transportation "improvements" may itself introduce a controversial element. For example, the installation of transportation management systems within existing ROW by the public agency may not be classified as a "highway improvement". Precedent, therefore, does not provide a clear guide to responsibilities when such installations require relocation of private telecommunications infrastructure.

Given both factors, a key element in negotiating shared resource agreements is allocation of relocation responsibility among project partners. A review of completed and ongoing shared resource projects across the country suggest some alternative approaches: private or public partners can bear all costs, or both can share the costs. The choice in each case will be driven by a number of project-specific factors, including the nature of relationship between the public and private

Allocation of Responsibility for Relocation		
Approach	**Description**	**Example**
Private partner responsible	Private partner solely responsible for bearing costs of relocation.	Ohio Turnpike
Public partner responsible	The state or public agency solely responsible for bearing all costs of relocation.	Missouri
Joint responsibility	Public and private partners share responsibility. For example, public agency provides duct for fiber optics; private partner relocates and reestablishes connectivity.	Maryland
Time-based shift in responsibility	Greater risks (costs) assumed by public partner in early years (e.g. first year); private sector responsible for all or greater proportion of relocation expenses in later years.	New Jersey

partners and the perceived risk of relocation. Moreover, the allocation may shift over time. In one case, the private partner(s) assume little or no responsibility in the near term, based on the argument that the public agency must be more accountable up front if it fails to anticipate improvement needs in the short-term. Private partners may be more willing to accept greater responsibility/risk in later years in part because they will have recouped a sufficient proportion (if not all) of their initial investment by that time.

Liability

Liability issues in shared resource projects can arise from system failure due to physical damage or equipment malfunction, vehicular accidents resulting from interference in the public ROW, breach of warranty and in the event the private partner pulls out of the deal or faces bankruptcy. The issue of liability is especially critical in such projects since both the public and private agencies work actively in the ROW and may even share the same infrastructure (conduit, tower). It is important to clearly identify all potential situations that could lead to a significant liability from each partner's standpoint, and specify the extent to which each partner will be held responsible in terms of the liability. Seemingly minor differences in contract

Type of Liability	Issues	General Practice
Actual damages	Assigning responsibility for physical repair	Liability assumed by party that caused the damage
Consequential damages (resulting from service interruption or breach of warranty)	Limiting public agency liability for damages from routine road work Where public and private cable or conduit are separate, allocating liability for damage from maintenance activities (assuming maintenance has not been delegated to a single party) Where several private entities are permitted access, setting up a dispute review mechanism requiring all potential parties to join their claims in one action (reduces public agency's exposure to claims) Providing in licensee's customer contracts that customers will not hold licensee and public agency liable for consequential damages due to service interruptions	Each partner is held responsible for only that portion of the liability that is directly connected to the activity initiated or undertaken by that particular partner. That is, a partner is not held responsible for any part of the liability if it resulted from an activity initiated by the other partner.
Tort actions	Limiting vendors' exposure Determining scope of sovereign immunity, especially in "joint ventures"	
Other	Obtaining adequate surety for vendor's obligations at reasonable cost	

"To accommodate future needs, public agencies might consider building in a proportional growth factor based on the private partner's expansion plans — e.g., as private partner expands, they must expand state infrastructure equivalent to 25 percent of what they provided for themselves."

language can result in various shades of interpretation and complicate the distribution of responsibility among partners. The following table presents an overview of the types of liability, associated issues and, where possible, the general practice in such circumstances.

Future Expansion

The market for communications is dynamic and communications for transportation — particularly ITS — is even less predictable. Communications needs in both the private market and public sector will most certainly change over the term of the shared resource project. It is thus important that, in the event of future expansion of the communications infrastructure, the public and private partners designate and agree upon the specific roles and responsibilities for each. Flexibility to achieve future expansion depends on clear guidelines or directions that specify individual and joint responsibilities regarding such issues as:

- Whether or not to build excess capacity at the outset to accommodate future needs (e.g., empty inner ducts for fiber optics, towers built to hold more antennae than installed initially for wireless communications) and, if so,

how much, who bears the cost, and how much of this capacity is allocated to each of the partnership participants,

- When capacity is added later on, which partner is responsible for overseeing and managing the expansion process (contracting, construction, administrative matters such as permits),
- Under what conditions can/should a new partner be brought in to assume responsibility for expanded capacity,
- What requirements must be satisfied prior to initiating the expansion (for example, to ensure non-discrimination),
- Who decides when and what upgrades in public sector electronics equipment are justified and who is responsible for installation and cost, and
- What elements of the current contract are applicable in subsequent contracts that may be developed in order to execute the required expansion.

The choice between initial overbuilding and adding-on later depends in part on costs of different types of capacity. That is, it is less expensive to add extra conduit and/or inner ducts at the beginning than to re-open the trench later on. On the other hand, electronics upgrading can be implemented at later dates without prohibitive installation costs. The balance between overbuilding and adding-on also depends on knowing how needs will change; sometimes expansion can only be initiated after needs are identified (e.g., additional traffic management VMS or closed-circuit TVs in new, previously undeveloped, areas).

Delineation of Design Parameters

Because shared resource facilities—either during construction or once complete—on public rights-of-way can compromise both the safety and operation of the transportation facility, the design parameters, particularly those pertaining to wireline installations, must be clearly addressed in a shared resources contract. Specifically, the contract must delineate specifications and general directions for the responsibilities of the public and private partner in relationship to the design, construction, and operation of shared resource facilities. In the absence of an universally acceptable set of design standards on installing communications infrastructure along rights-of-way, public agencies need to refer to existing standards as appropriate. It should keep in mind, however,

Wireline Facts (1): General

- Maintenance access necessary for both above and below ground structures
- Structures require equipment shelters for switching and re-transmission equipment
- Clear zones typically required for all structures to protect the public and prevent damage

Wireline Facts (2): Underground Design

Location: factors driving location include availability of ROW, safety consideration construction workers, costs, susceptibility to damage and location of other utilities

Placement: may be plowed in rural areas but will usually need to be trenched in urban/suburban areas; if encased, duct will need to be trenched; duct allows for joint use with other utilities

Cable Depth: sufficient to prevent accidental damage due to normal surface activity; marked with above-ground markers to minimize damage potential

Groundings: buried cable typically must be grounded both at the beginning and along cable route

that fiber optics and communications infrastructure differ from other utilities in their characteristics. Success in implementing shared resource projects may be enhanced by adapting technical specifications in light of this.

In general, the categories of design concerns, that should be addressed in contracting include:

- Safety,
- Design considerations,
- Constructability,
- Maintenance, and
- Accommodation of telecommunication features within the transportation corridor.

Safety Issues

Safety issues must be addressed in the contracting documents to assure appropriate responsibilities are assigned and all parties, public and private, understand their role in assuring that safety issues are addressed in project development. Standard guidelines for safety-related items exist and should be applied as appropriate. Those guidelines to be used should be referenced in the contract documents.

In addition, the concerns for safety during construction and maintenance operations need to be incorporated as part of specific agreements, either by reference or inclusion in the contract documents, in order that all parties involved with the project incorporate safety concerns in their work. The design of the project should reflect standard specifications adopted in AASHTO guides as appropriate for the project (utility accommodation, National Manual on Uniform Traffic Control Devices for Streets and Highways, etc.).

Certain requirements for shared resource projects in particular may be beyond agency existing guidelines. Therefore, the contract documents should include any additional materials that may be needed for the specific project. An important aspect of the safety issue involves those safety features enforce during construction and maintenance activity where there is great potential for disruption of traffic flow from lane closures, detour configurations, and construction zone management practices. These requirements should be incorporated in the documents and their use explicitly referenced. Those guidelines to be enforce during maintenance activities need to be specifically noted and it may be appropriate to

include a permitting process or notification requirement prior to maintenance of telecommunications facilities on public rights-of-ways. Horizontal installations will require different safety concerns than wireless facilities, which usually are remotely located and do not normally occupy near proximity to traveled lanes, and where appropriate should be dealt with separately.

Design Parameters/Considerations

There are a number of design features of telecommunications facilities that need to be explicitly addressed in standards or guidelines. The contract documents should explicitly refer to such adopted specifications or should include specific requirements for the project in question. Public agencies need to take some care that the standards are applied in a non-discriminatory fashion as required under the Telecommunications Act of 1996. The use of standard specifications can reduce the chance of these problems occurring but not entirely eliminate them; therefore, managers need to be aware of the impact of the application of standard materials to a specific project.

Standards should address the location or interval or placement for poles or other structures which could represent hazards to the motoring public. The distance from the edge of pavement becomes a factor in these installations and any above ground facilities should be reviewed to assure that necessary clear zones are maintained on highway facilities.

Wireline facilities will require nodes and re-transmission locations which must be accommodated near to the main line of the cable installation. This presents particular challenges where auxiliary power sources must be maintained to ensure that the amplification and re-transmission devices remain operable at all times. Care should be taken in placing these vaults and structures away from the main travel lanes, but in serviceable areas so that equipment necessary for their maintenance does not obstruct or create safety problems on the travel-way. Likewise, maintenance equipment and storage sheds need to be located within reasonable servicing distances from the telecommunication equipment.

Wireless towers which are located off of the immediate right-of-way of facilities present other design challenges — both technical and aesthetic. Height, appearance, and possible interference with other wireless equipment all should be taken into account in location of these facilities. Public sponsors will need to ensure that appropriate local controls — zoning, building permits, etc. — are acquired as necessary for a private activity that may not fit under normal exemptions

Wireline Facts (3): Above-ground Design

Location:	behind sidewalk or specified distance from curb for urban areas and at edge of ROW in rural areas
Pole Spacing:	depends upon type of overhead structure to be supported, storm loads expected, wire capacity, locational constraints
Clearance:	sufficient to provide for safety under storm loadings (typically at least 15.5 feet along and across public roads and 23.5 feet over railroad tracks when loaded
Joint-use:	taller poles may be shared by electrical power, telephone and cable television

Physical Facts (Wireless):

- Each antenna requires equipment shelter for switching equipment (typically 150-400 square feet per site), which must be located within 100 feet of the antennae it supports
- Line of sight technology means areas with high trees require higher support structure
- Three types of antennae base:

Monopole:	single tubular pole, typically less than 200 feet high
Lattice tower:	3-4 faces with lattice inter-connects typically up to 350 feet high
Guy tower:	tower with guy cables to stabilize; this type requires most land base and is the least stable

- Most needs can be satisfied with 150-250 foot high tower/pole.
- Access necessary to base of antenna and to equipment for maintenance
- Antennae located in regions with freezing precipitation will require clear area around base and guy wires to prevent damage from falling ice

for these public agents. In addition, the Federal Aviation Administration (FAA) may have height controls for areas near airports.

Some public agencies may wish to enter into lease agreements as part of their contracting processing to provide location for maintenance equipment and facilities at existing maintenance locations used by the public agent for their equipment. While this provides the opportunity for additional income for the right of way owner, available space and other operational concerns need to be considered prior to contracting as decisions will be needed as to how to provide for this type of use, another dimension of shared resource.

Constructability

Although constructability problems do not normally occur in most telecommunications shared resource projects, it is an area that must be monitored with concern and should be addressed in contracting documents. Constructability for wireline facilities that are simple cable installation projects are minimal and, once traffic control is addressed, present little problem beyond current traffic control standards. However, once one moves behind the simple installation of the cable to constructing re-transmission stations, cable nodes, and other facilities, constructability may present a particular challenge as to the operation of the transportation facility. In urban areas, high volume facilities are very sensitive to disruptions along the shoulders and in the median and great care should be taken in the location and construction management requirements for facilities located in these areas.

Maintenance Concerns

Telecommunications facilities represent relatively long-term investments for which utility over long time periods is necessary to ensure that expected returns will occur. Shared resource contracts must include provision for maintenance of telecommunications equipment and facilities located in rights-of-way as part of shared resource projects and must address these concerns explicitly, both in terms of the accomplishment of the maintenance (who's to carry it out), and the financial responsibility for conducting the maintenance, both routine and longer-term maintenance and upgrade projects.

Accommodation of Telecommunication Features

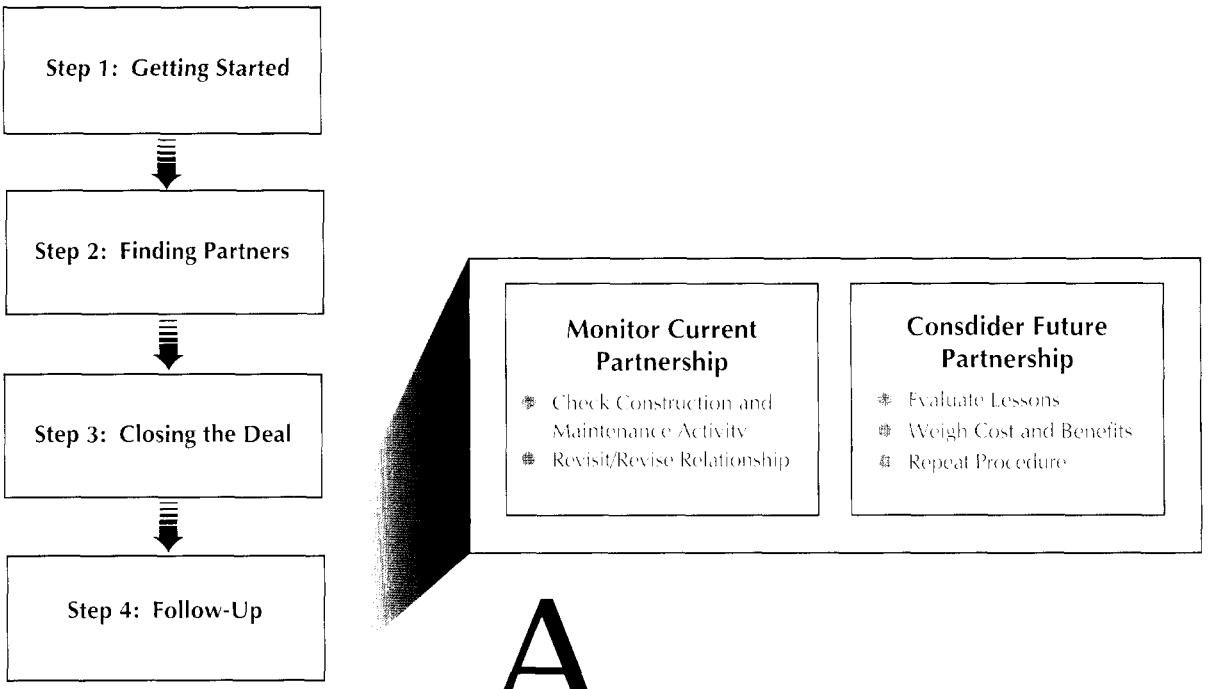
Most shared resources projects represent refittment of existing transportation rights of ways with facilities to accommodate telecommunications activities, either wireline or wireless. As this area of technology matures, there will be a need to

accommodate telecommunications within the design of transportation projects from the beginning. Contract provisions should be considered to describe how these needs will fit into future projects that may be conducted by the public agency. It is at this level that full flexibility for consideration of relocation, construction, maintenance, and access requirements can be accommodated in project design.

While it may be difficult to foresee what these needs may require, it is incumbent upon the partners in the shared resource agreement to carefully resolve responsibilities for these eventualities in their contracting process. Most agencies will find it very difficult to project and to foresee exactly what form these opportunities may take in the contract process. Therefore, contract provisions to provide flexibility for the partners need to be include in the contract documents.

"On limited access roadways, use existing structures such as bridges, overhead and roadside signs to place antennae or as base for extended structures, both to minimize visual impact and safety problems. On local roads try to blend with existing phone and electrical poles, e.g., use wooden poles for antennae, but taller than the standard electric pole."

Step 4: Following Up



After the contract or contracts are signed and the partnerships are officially launched, the public partner shifts to follow-up activities. There are two types:

1. Monitor current partnerships; and

2. Consider future partnerships.

Monitor Existing Partnerships

There are several reasons for monitoring current partnerships. Aside from the obvious need to ensure compliance with contract terms, the public agency should review how the arrangement is working out and decide whether or not the relationship would benefit from changes in contract or operating terms. Component activities include:

- Check construction and maintenance activity;
- Review partner resale and sublease efforts; and
- Revisit and, if necessary, revise partnership relationship

to adapt to conditions not foreseen or adequately addressed in the initial negotiations.

Check Construction and Maintenance Activity

Whether or not the partnership contract spells out construction and maintenance standards in detail, the public agency should monitor these activities for adherence to its design and safety standards. Public agency investigation and documentation serves two objectives:

- Verify adherence to specifications and standards;
- Map communications facilities and equipment (both above and below ground) to avoid future damage to buried equipment and interference with above ground infrastructure.

Review of current and planned construction can also serve another purpose: to determine whether greater cost-effectiveness or efficiency can be achieved if practices are changed in some way, for example, by re-ordering project milestones to adapt to a shift in market conditions or by co-locating equipment that originally was to be distributed between two different sites.

Revisit/Revise Relationship

Once the partnership is underway, the public agency should stand back and review how the relationship is operating with an eye to negotiating revisions with their private partner if they feel it is warranted. The purpose of revisiting the contractual relationship is to adapt that relationship to changes that have taken place since the contract was originally negotiated. In some cases, those changes are shifts in real factors; in other cases, they are differences between anticipated and actual conditions.

Some of the reasons for revisiting and possibly revising the relationship might include:

- **Unanticipated challenges:** Certain aspects of the relationship may be different in practice than anticipated, for example, the public sector may find that legal challenges to earmarked cash revenues argues for barter arrangements;
- **Change in communications needs:** Public sector communications needs may be different than forecast, arguing for a greater or lesser reliance on in-kind compensation;

- **Shift in communications design:** Public sector communications blueprint may change in such a way that they want less communications capacity of a particular type in one area and more in another area than originally planned; this might be the case if there were a shift from wireline to mixed wireline-wireless systems to support transportation in an urban area, for example, coupled with increased demand for wireline capacity in adjacent suburban or rural areas.

- **Increase in demand for communications:** Both public and private demand for communications capacity may be greater than originally forecast and the public sector (or private partner) would benefit from increased capacity.

Several experienced shared resource project managers suggested that contracts and relationship be made flexible enough to allow for such revisions, for example by:

- Denominating compensation in generic or equivalent-value terms (to allow revisions in type and placement of equipment, or shifts between barter and cash);

- Including contract provisions that deal with capacity expansion, for example, setting out conditions for new construction by current partners, including a time limit for exercising expansion options; describing when and how new partners might be selected over existing partners to expand capacity in the system;

- Describing the type and degree of changes that can be re-negotiated when leases are renewed without violating the basic contract.

Step 3 reviewed some of the issues in dealing with future expansion as part of the contract negotiating process. To the degree that these were not adequately addressed and included in the signed contract, they need to be included in Step 4's re-evaluation process.

Consider Future Partnerships

Because the market for shared resource ventures is unpredictable, there is always the possibility that additional project opportunities will present themselves. These opportunities may come directly from the private sector in the form of new opportunities for existing arrangements, as completely new prospects in previously undeveloped rights-of-way or alongside established projects, or as some combination. It is also possible that the agency will itself seek to generate new opportunities for partnerships to supplement those already in place.

Consequently, the shared resource planning process should consider the possibility of new partnerships beyond the initial one(s), determine whether or not to pursue new opportunities if they arise, and, if so, integrate into the process the means for effectively accommodating such opportunities. The process for accommodating new opportunities includes:

- **Evaluate lessons** from current partnership(s).
- **Weigh costs** and benefits of new partnership(s), and
- **Repeat procedure** described in this guidance for constructing shared resource partnerships.

Evaluate Lessons

Although lessons from prior experience are a central component of this guidance, new lessons are learned as agency expertise expands and the telecommunications market itself evolves. Such hindsight is valuable when it can be applied in future situations; this is certainly true for shared resource projects since they are a fairly new form of public-private partnerships.

By the time that one or more shared resource projects have been undertaken, the public agency involved will have gained institutional expertise in developing such projects. Moreover, the process will have highlighted what worked, what did not work, and why. That experience must be captured and used in structuring future partnerships — ideally through formal project reports, but at least informally through records maintained or notes submitted for the file. Lessons learned include a myriad of issues, such as:

- **Costs**: how much administrative work did it take to execute the project? Were support costs greater or less than expected? Will future costs be similar/less/more?
- **Benefits:** did the agency save costs as a result of the project? Can that value be estimated? Is there a better way to receive benefits, e.g., different form of compensation?
- **Administrative:** was the agency quick to respond? Could the process be streamlined to increase the chance for future prospects? Were any technical steps missed or overlooked (e.g., aesthetic considerations)? Was the process of enlisting partners (procurement) effective? Was the RFP responsive to private and public sector needs — sufficient information, too vague or too detailed? If some vendors did not respond, why not?

- **Institutional:** were the correct public sector participants involved at the start? Should others have been added? Would outside technical support help? Was there political or corporate opposition? How might this be anticipated and addressed in the future?

- **Negotiations:** did the negotiations proceed on schedule to the mutual satisfaction of both the public agency and the private partner? Were some issues of importance overlooked (surfacing later in the relationship)? Was the contract too specific or restrictive? too general or vague?

Weigh Costs and Benefits

Lessons learned include estimates of costs and benefits from the project. As part of its hindsight analysis, the agency should evaluate the relative value of undertaking similar initiatives in the future, particularly when the parameters are known. That it, the agency will have information on the costs of the procurement process. It can also estimate the benefits anticipated, whether from set lease payments or provision of additional communications capacity to meet needs not currently serviced.

For example, if the contract mechanism is that of an open lease with standardized terms for compensation, the agency may be willing to entertain any size projects, large or small, since the cost of adding a new partner is very low and the benefits are likely to outweigh costs. On the other hand, if standard practice is to issue RFPs for each venture and its history indicates a high per-project cost for competitively bid and negotiated procurements, the agency may well reject applications for access to a small segment or land parcel because the procurement costs could far outweigh the anticipated benefits.

Repeat Procedure

If agency officials decide that there are net benefits to be gained from expanding their shared resource program, they should review the overall procedure described in this report, review its resources, and decide which steps need to be repeated when they pursue additional prospects. The four step implementation process may have to be repeated in its entirety, for example if the original project was a wireline shared resource venture and the subsequent one focuses on wireless communications. However, even when the original project and the new opportunity are different, it is likely that much of the experience, documentation and expertise will still be relevant and some sub-steps of the process can be skipped over or compressed.

Conclusion

Shared resource projects offer an opportunity for partnerships to address both private and public sector telecommunications needs through joint use of public freeway and highway rights of way, generating cash and/or in-kind compensation to reduce the net cost of public sector ITS and transportation communications. This guidance has endeavored to identify and describe activities and issues involved in such arrangements.

Because the opportunity for shared resource partnerships is based on market forces and has a limited window of opportunity, timeliness is critical. Another window of opportunity may open again in the future as the market for telecommunications evolves and new technologies are developed. But when and how that opportunity will be presented, and how relevant it will be for roadway ROW owners, cannot be forecasted; public agencies are well-advised to evaluate and act upon current opportunities rather than postpone in the hopes of future opportunities.

In undertaking this process, public agencies should keep the following practical maxims in mind:

- **Keep the process moving;** although preparatory activities are important and information gathering is significant to the process, timeliness is critical.

- **Strive for administrative efficiency;** bureaucratic efficiency is important not only for the sake of timeliness but also to ease the perceived and real administrative burdens faced by potential private partners; project champions and project managers can be critical to success.

- **Seek a judicious balance between conflicting objectives;** for example, balance the benefits of contract comprehensiveness and specificity (to avoid misunderstandings) with the long term advantages of partnership flexibility (to adapt to changing conditions).

This guidance is descriptive rather than prescriptive. As the guidance indicates, there are a number of ways to approach and structure shared resource projects. First, the activities defined here can be undertaken in different sequences or overlapped to suit each ROW owner and its partners. Second, there are different options for addressing the issues, thus projects can be adapted to individual circumstances and variations among states, localities, and partner preferences. Most importantly, this means that shared resource projects are doable in a wide range of contexts so long as the window of opportunity is open.

Appendix A

AASHTO POLICY RESOLUTION PR-21-95
TITLE: INSTALLATION OF FIBER OPTIC FACILITIES
ON HIGHWAY AND FREEWAY RIGHTS-OF-WAY
(As approved by the AASHTO Board of Directors on October 29, 1995)

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 purpose, 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 programs 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 I Highways, in consultation with the task force, its affected Subcommittees and other AASHTO Committees as | appropriate, to prepare appropriate guidelines on the technical, operational, economic and financial aspects of the I placement of fiber optic cables in highway and freeway rights-of-way for eventual adoption by the Board of ~ Directors and publication by AASHTO.

Appendix B

KEY SECTIONS OF THE TELECOMMUNICATIONS ACT OF 1996

High Relevance

1. **Section 251.** Interconnection
2. **Section 253.** Removal of barriers to entry
3. **Section 254.** Universal service
4. **Section 259.** Infrastructure sharing
5. **Section 303.** Preempting regulation of telecommunications services
6. **Section 401.** Regulatory forbearance
7. **Section 703.** Pole attachments

Moderate Relevance

1. **Section 207.** Restrictions of over-the-air reception devices
2. **Section 256.** Coordination for interconnectivity
3. **Section 302.** Cable service provided by telephone companies
4. **Section 602.** Preemption of local taxation with respect to direct-to-home (DTH) services
5. **Section 704.** Facilities siting

Informational

1. **Section 102.** Eligible telecommunication carriers
2. **Section 252.** Procedures for negotiation, arbitration and approval of agreements
3. **Section 255.** Access by persons with disabilities
4. **Section 402.** Biennial review of regulations: regulatory relief
5. **Section 403.** Elimination of unnecessary FCC regulation

American Association of State Highway
and Transportation Officials
444 North Capitol Street, NW, Suite 249
Washington, DC 20001

ISBN 1-56051-045-5