The following Appendices A through E are supplemental to *NCHRP Research Report 1053: Valuation and Compensation Approaches in Utility Accommodation: A Guide* (NCHRP Project 15-70, "Valuation and Compensation for Accommodating Utility and Communications Installations in Public Rights-of-Way"). The full report can be found by searching on the report title on the National Academies Press website (nap.nationalacademies.org).

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APPENDIX A

Literature Review

The following review begins with presenting definitions and information forming the basis for categorizing fee structures, compensation approaches, and valuation methods within this research effort. This chapter summarizes a comprehensive literature search for identifying valuations for accommodating utilities and communications installations along highway rights of way and includes discussion of current and planned policies regarding compensation for utility accommodations. The following definitions provide the basis for this study and influence the survey questions, classification framework, and future guidance. These definitions are adapted from referenced materials.

- **Compensation ~ Cash**

Cash provided as compensation for accommodation involves a flexible and liquid currency that may be allocated to general funds or projects within legal restrictions. These restrictions may involve restricting funds for transportation-related items or projects, or if federally connected, funds may only be eligible for federal-aid projects (Nossaman et. al., 1996).

- **Compensation ~ Barter**

Bartering would involve the exchange of goods and services for the benefit of accommodation. The value to the owner versus the cost to the provider can create a gap between the exchange where the ROW owner would get less in barter value than the utility is willing to pay for the ROW or vice versa. The benefit is advantageous if goods or services are needed by the ROW owner, but the value must consider current needs, future needs, loss of value due to technological advancements, and limitations of other service providers to be accommodated (Nossaman et. al., 1996).

- **Easement**

An easement is a property interest typically for a defined use of the land owned by another, it can be permanent or temporary. Easement types and uses vary by state and could involve public or private landowners (FHWA, 1996, Jakubiak et. al., 1997, and Anderson, et. al, 2009).

- **Lease**

A lease is an agreement for a specific time period that grants the right to use a property owned by another. The lease agreement may involve various payment forms, including fixed-prices or percentage-based, and these forms could also be adjusted over time by an independent index (FHWA, 1996 and Jakubiak et. al., (1997).

- **Franchise**

A franchise involves the privilege granted to engage in defined business practices and does not involve a real property interest, though some states classify a franchise as a form of real estate where land is involved (FHWA, 1996 and Jakubiak et. al., (1997).

- **License**

A license grants permission to a utility to perform an act or practice of business that otherwise would be considered trespassing or otherwise illegal (FHWA, 1996 and Jakubiak et. al., (1997).

- **Resource sharing**

Resource sharing sometimes referred to as in-kind compensation or as shared use, involves a bartered arrangement of providing services, equipment, or other facilities such as conduit space as part of an agreement (Kraus et. al., 2020).

- **Revenue sharing**

Revenue sharing involves the division of compensation within an agreement. For instance, a ROW owner may receive some division of compensation, typically cash on a percentage basis, as the result of lease payments paid by a service provider to a utility infrastructure owner (e.g., fiber-optic cable owner) that is accommodated on the ROW (FHWA, 1996).

- **Competitive auction**

A competitive auction is a valuation approach where compensation levels can be set by accepting the high bids from competition for space. In situations where demand or potential demand for ROW exceeds availability, accepting bids for accommodation may be appropriate for establishing compensation levels. Resource sharing can be a consideration in a competitive auction but needs critical assessment (FHWA, 1996).

- **Cost-Based Valuation**

A cost-based valuation determines compensation levels according to the recovery of the actual costs incurred by the space granting agency; state DOTs in the context of this research. This valuation is mentioned by practitioners as being the desired method of most broadband and telecommunications installers. The valuation would be based on administrative costs for managing and processing the accommodation.

- **Valuation of adjacent land**

The valuation of adjacent land is a ROW valuation approach where proximate real estate fair market values are used as a basis for determining compensation levels for ROW space. Considerations of continuity add a premium to these values since a utility seeking accommodation would have access to a longitudinally continuous ROW of one property owner in these agreements (FHWA, 1996).

- **Cost of next best alternative**

The consideration of the cost of the next best alternative for accommodation is another valuation approach to set limits of compensation for ROW. Numerous considerations must be considered, including the ease of access, security, installation costs, etc., of the accommodation in highway ROW versus other landowners. The value determination is then the upper limit of possible compensation for the highway ROW accommodation (FHWA, 1996).

- **Needs-based compensation**

Needs-based compensation is a valuation approach where ROW owners set compensation levels based on the projected needs of the ROW for utility accommodations. The levels are determined to be too high if interest in accommodation is not expressed or lower offers are made (FHWA, 1996).

- **Historical Experience**

Using historical data or experience is a valuation method based on setting compensation levels according to previous agreements. This approach may understate the levels if all considerations are not accounted for or if historic resource sharing does not equate to the compensation level a utility was willing to pay (FHWA, 1996).

- **Market Research**

Market research is a valuation approach where potential utilities to be accommodated are queried for what compensation levels they would be willing to pay. The feedback from the market sets the compensation level for accommodation (FHWA, 1996).

These definitions informed several aspects of the research, including the development of a survey for state DOTs, the development of a framework for organizing, categorizing, and analyzing valuation and compensation approaches, and the investigation of policy and legislation regarding these approaches. Further, it was also influential to understand underlying themes and reasoning for utility accommodations in public right of way.

The public need of utilities and their transmission of goods and services should be recognized, in the same way, there is a need to evaluate and potentially charge for the permitted use of public ROW by these utilities as there is value provided. While many traditional utilities have been accommodated by DOTs with minimal or zero fees, the advent of advancing telecommunications caught the attention of some state DOTs for implementing compensation approaches for accommodation. While the background of other utility types is not as well documented, the accommodation and associated compensation of telecommunications presents the underlying needs, storyline, and background for this research.

In recent years, DOTs have increasingly been approached for permission to use highway ROW by telecommunication companies to locate their telecommunication cables, cell towers and small wireless facilities. As we know, fiber-optics is an important technology capable of transferring data quickly and is needed in today's society. There are thousands of miles of fiber-optic cables installed in public ROW in every state with an expected increase to support economic growth (McBride et. al., 2019). As roads and highways connect populous areas, they also present corridors for needed technology connection. This describes the alignment presented in Figure A.1, showing the United States' long-haul fiber map, the United States' interstate infrastructure map, and the United States' railway map introduced by Durairajan et al. (2015).

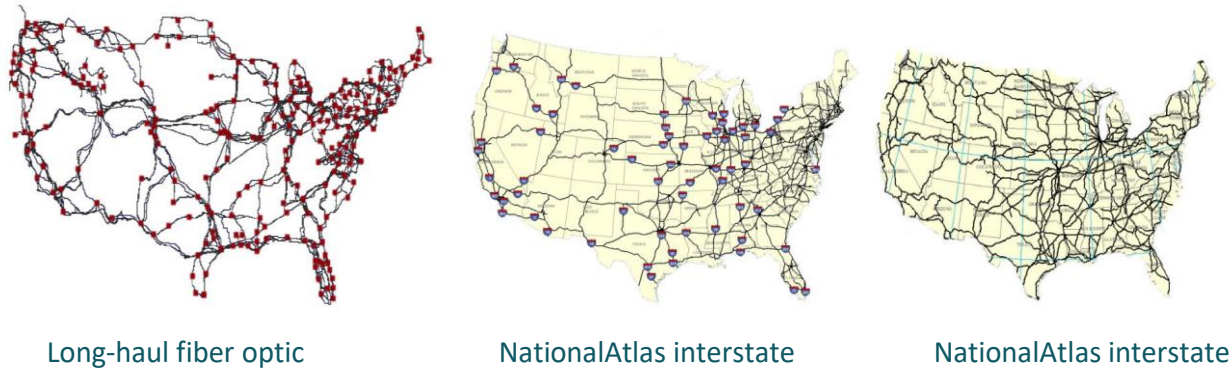


Figure A.1 United States Fiber Optic Mapping (Durairajan et al. 2015)

Durairajan et al. (2015) produced these maps and performed an analysis to determine to what degree fiber-optic lines have followed previous infrastructure ROW. They then deduced the graph in Figure A.2, which shows the fraction of co-location of fiber optic long-haul lines to rail and roadway infrastructure.

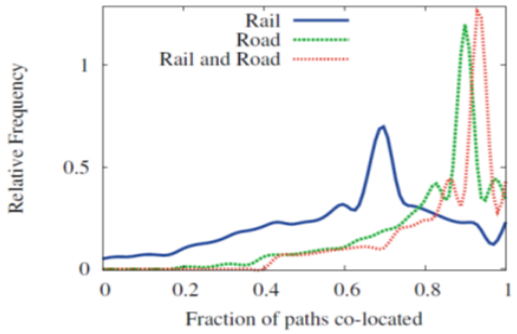


Figure A.2 Co-location frequency of long-haul fiber-optic lines to other infrastructure (Durairajan et al. 2015)

These figures visualize the typical co-location of linear infrastructure, especially with roadways, and to the highest degree where roadways and railways follow adjacent alignments. This emphasizes the need for having resolute guidance on accommodating these facilities in public ROW as state DOTs. The next great infrastructure system (fiber optic backbone) is here and growing in complexity daily. Beyond telecommunication, new demands for DOT ROW by renewable energy projects, various cellular technologies (which need fiber optic access), and the needs that will arise for connected and autonomous vehicles are going to test the limits of ROW accommodation policies.

Again, there are three basic revenue stances on accommodation conditions: revenue generating, revenue neutral, and non-revenue generating (Figure 2.1). The varying ROW valuation approaches are described in FHWA's 1996 Shared Resources: Sharing Right-of-Way for Telecommunication Guidance and Institutional Issues. These valuation approaches include:

- Competitive auction
- Valuation of adjacent land

- Cost of the next best alternative (potential competition with the railways)
- Needs-based compensation
- Historical experience
- Market research (1996)

There are also alternate accommodation approaches to be considered that include practices such as service bartering, joint trenching, utility corridors, service exchanges, and others. The valuations of these approaches warrant consideration in this study as well.

Most state laws authorize public utilities to use road ROW, provided they do not obstruct or hinder the usual travel, adversely affect public safety, or obstruct the legal use by other utilities. However, state laws also provide cities and municipalities the ability to establish rules and regulations governing the use of their public right-of-way. All these rules and fees must be competitively neutral and not unreasonable or discriminatory. DOTs making accommodations may charge for these installations in the form of fees, rental, leases, in-kind resource sharing, bartering arrangements, and multiple other approaches. These variations are due to the complexities of individual state legislation, the complex makeup of state population and land use, the variations in access control of roadways, the multiple approaches to valuation, and others. This research is needed to assist DOTs in the development of guidance on everything from navigating these complexities to valuation approaches and compensation structures selected within the confines of their applicable legislation.

In NCHRP Synthesis Report 224, Williams, nicely summarizes the evolution of accommodating utilities, especially for longitudinal occupancy in controlled access ROW. The study reports on a survey conducted in 1992 with state DOTs and includes the results of an informal survey conducted by the Federal Highway Administration (FHWA). The survey was aimed at identifying current practice and the perspectives of highway officials regarding the use of right-of-way in limited or controlled access facilities. Again, much of the consideration was in regard to safety concerns for accommodating utilities in these rights-of-way. Approximately 25% of the states reported permitting longitudinal placement of utilities in freeway right-of-way at the time of the surveys (1996). These accommodations presented a shift in mindset that was largely being driven by the advancement of fiber-optic cable which could safety be accommodated underground. The synthesis reported an expectation that these trends for desired accommodation in controlled access ROW would continue and that additional research would be needed (William, 1996).

FHWA, (1996), Nossaman et al., (1996), and Jakubiak et al., (1997) provide three resources that entail the similar findings through their research efforts. The initial document mentioned (Shared Resources: Sharing Right-of-Way for Telecommunications), reports details of the research effort, and the second (Sharing Right-of-Way for Telecommunication: Guidance on Legal and Institutional Issues) presenting the findings of the research in a guidance document. The third resource identifies and explores the shared resource of wireline and wireless projects. These resources present the bulk of the material for defining valuation approaches and compensation methods. FHWA (1996) mentioned that nine states had the authority to charge utility owners fees in the highway ROW. The annual or annualized fees per mile varied from $736 in rural areas to $7,500 in urban areas. The study also described four legal forms DOTs could use to allow such occupancy by utility owners: easements, leases, franchises, and licenses. The varying ROW valuation approaches are described in FHWA's Shared Resources: Sharing Right-of-Way for Telecommunication Guidance and Institutional Issues (1996) mentioned above.

Multiple approaches are usually needed to arrive at a reasonable figure, as no single approach will yield a completely accurate ROW value. FHWA's, *Digging Deep in Determining Fair Market Value*, mentions that there are different factors to be considered when determining the fair market value or rent for broadband services, including:

- Cost-based (the useful life of fiber cable, maintenance cost)
- Circuit-based (i.e., direct versus indirect route)
- Objective-based (i.e., reduce costs to fiber routes terminating in underserved areas)
- Market-based (i.e., the existing market will adjust based on competition) (2013)

There are also alternate accommodation approaches to be considered that include practices such as joint trenching, utility corridors, and others. These studies present a straightforward framework explaining that compensation can basically come in two forms: cash and bartered approaches or some combination of the two. This framework is clearly presented in Figure A.3.

A critical note to mention comes from FHWA (1996), Nossaman et al. (1996), and Jakubiak et al., (1997) in that the main barrier to DOTs to receiving compensation is the obligation of highway agencies in some states to allow public utilities in the ROW at no charge other than fees for the cost of administering the franchise. The restriction comes from the regulations of that state. Another barrier had been the policy regarding federal-aid highways limiting longitudinal utility encroachments. While that has since changes, some state policy has maintained those restrictions.

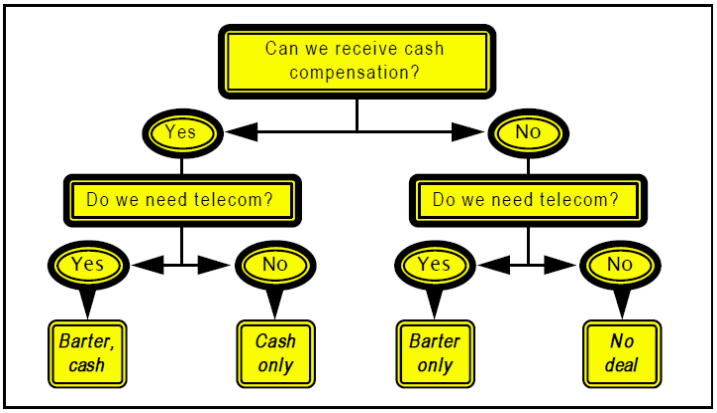


Figure A.3 Types of compensation for telecommunication accommodations (Nossaman et. al., 1996)

The choice of whether a telecommunication company is granted an easement, lease, franchise, or license to use ROW, determine the varying levels of freedom for the telecommunication company within their permit. Generally, easements and leases give the user rights to the land, while franchises and license arrangements do not (FHWA, 1996, and Jakubiak et. al., 1997). Right-of-way usage can also require monetary or in-kind compensation such as the use of conduit, fiber-optics lines, communication services, or a combination thereof (McBride et. al., 2019). Estimates of appropriate levels of compensation should be based on the valuation of access to the public right of way. To determine the general value of right-of-way for telecommunication accommodations in each locale, FHWA, (1996) and Nossaman et al., (1996) suggested the following main factors affecting the value and variations in the value of locating the telecommunication facilities in highway right-of-way:

- Location (i.e., urban, suburban, rural)

- Location of the facility (i.e., location in the country, State versus other State).
- Location of the facility within the highway right-of-way (i.e., median versus against the fence line).
- Infrastructure security.
- Allocation of financial responsibility for accidental damage and forced relocation.
- Term of contract and length of right-of-way.
- Connectivity to the remainder of the system.
- Type of infrastructure includes maintenance needs and capacity of the facility.

In addition, timing is a critical factor because demand for right-of-way of any kind strengthens or weakens as market situations shift and competition changes.

Many States allow utilities to place their infrastructure on highway rights-of-way at no charge. Other states require some kind of compensation, such as cash or an in-kind arrangement. There is another kind of compensation for telecommunication facilities in resource sharing of dark fiber, conduit, communication services, or a combination thereof. All these types of compensation approaches must be through an agreement between the public agency and the utility owners (FHWA, 2012). In some cases, state DOTs may not have the legal authority to enter into such agreements. FHWA, (2012) prohibits shared resources to telecommunication facilities if state laws restrict the accommodation of utilities or restrict private utilities on certain types of transportation facilities. Also, if state law mandates free access for utilities, or if public agencies cannot discriminate among utilities (e.g., allow access for telecommunications, but not other utilities).

Kraus, (2014) in the NCHRP Synthesis Report 462, focused on longitudinal utility installations on controlled access right-of-way; this report did not address utility crossings. Synthesis Report 462 provides an excellent summary and references many of the previously mentioned resources in presenting the evolution of seeking compensation for longitudinal accommodations. The compensation can be cash payment, sharing use of a communication facility, and an indefeasible right of use to dark fiber. Because compensation is not the central focus of Kraus' synthesis, it is a small portion of the overall report, but it nonetheless captures approaches and, in some cases, the amounts that particular states were charging for longitudinal accommodations. This synthesis also discusses the possible compensation approaches and resource sharing methods used by some state DOTs. Kraus (2014) mentioned that some states allow shared resources between utility owners in the right-of-way. Shared resources can include installation of extra conduits for future expansion, joint trenching, and access to a dark fiber network.

Kraus, et al, (2020) published a recent report for NCHRP titled, *Legal Issues Concerning the Use of Transportation Facilities to Generate Revenue for State DOTs*. This recent publication presents an analysis of the legal issues related to approaches by state DOTs to accommodate communication utilities within state ROW and the potential options to generate revenue from such access. The study investigated statutory and regulatory authority for the accommodations, the ability to generate revenue from this access, the impact of various types of rights-of-way and access control, and practices of state and tolling authorities in the valuation approaches for determining compensation. The report also considers premiums for access in continuous longitudinal accommodations and discussions of profit or resource sharing. The legal digest report provides a useful summary and legal slant to the considerations of the central objectives of this research. Additionally, there is a very comprehensive list of fees as shown in

Table A.1 and compensation approaches as a result of a survey with DOTs and other transportation authorities.

Table A.1 Small Wireless Facilities and 5G Facilities Fees Schedule (Kraus, et. al, 2020)

State	Small Wireless Facilities	5G Facilities
Alabama	Fair and reasonable compensation	
Alaska	▪ Permit Fee: $600 for most installations. ▪ Collocations or additions to existing infrastructure: $100, facility > 200 ft in length, an extra $1 per foot (not to exceed $10,000).	
Arizona	▪ Competitively neutral and nondiscriminatory. ▪ Allows in-kind agreements	▪ Application fees do not exceed $750 ▪ $100 each for the first five small wireless facilities and $50 for each additional.
California	Fees cannot exceed a reasonable cost for providing access and issuing the permit	
Colorado	In-kind compensation is not permissible, and the fee or charge must be related to the costs incurred by the political subdivision.	No fee
Connecticut	No fee to $100 for the permit	
Delaware		No more than $100 per small cell facility on a permit application.
Florida	▪ $300 for a general permit ▪ $625 for a standard or modification to a standard permit, ▪ $50 for ROW occupancy transfer.	$150 per year for collocation
Hawaii	Fees should defray any costs to the department	No in-kind compensation No fees
Idaho	▪ $50 for non-interstate utility permit: new, modify, relocate with no prior easement rights ▪ Interstate utility permit: fees addressed at the time of application. ▪ Interstate and non-interstate maintenance or emergency repairs with no prior easement rights: no charge.	
Illinois	▪ Utility access to fully access-controlled based on appraised market value. ▪ $300 for attachments to highway structures.	▪ Up to $650 for the collocation of a single wireless facility on an existing pole. ▪ Up to $350 each for applications with multiple collocations. ▪ $1,000 if the collocation involves the construction of new facilities. ▪ No fees for providers have the authority to occupy the ROW
Indiana		▪ Fees cannot exceed the amount charged for a permit of a similar type or $100 per small cell facility.

State	Small Wireless Facilities	5G Facilities
		▪ No application or permit fees for routine maintenance and replacement
Iowa	▪ $14,500 / cable or $7,250 mile /cable. For longitudinal ▪ $12,000 / installation of $2,500/mile/ cable for other installation	No fee limits are set
Kansas		▪ Maximum $500 for a collocation does not require a substantial modification. ▪ $2,000 for a collocation that does require substantial modification
Louisiana	▪ Fees do not exceed fair market values of the property or the cost of administering the permit ▪ May reduce fees in exchange for shared resources	
Massachusetts	Reasonable rates	
Michigan	▪ $1,000 / mile of longitudinal access with a minimum fee of $5,000. ▪ Additional fees can be charged.	▪ Access fee: No more than $20 annually unless a utility pole is erected, then $125 annually. ▪ Permit application fees: $200 for each small cell wireless facility and $300 if a new utility pole is required in addition. ▪ No permit fees for replacement of facilities, maintenance, and attached to wires.
Minnesota		Legislation limits the authority to charge fees
Missouri		▪ Cannot exceed $100 per pole ▪ Collocation rate cannot exceed $150 per pole per year.
Nebraska	Permit fees can be levied	
Nevada	▪ Fair and nondiscriminatory ▪ In-kind compensation	
New Mexico	Reasonable schedule of fees for access permits	
North Carolina		Legislation does not mention fees or rates applicable to NCDOT permits
North Dakota	▪ $100 for a crossing. ▪ $50 per each additional crossing on the same permit. ▪ $200 for an open cut crossing. ▪ $200 /mile for a longitudinal facility. ▪ $100 for bridge attachments. ▪ $50 for down guys, push braces, soil borings, and test wells. ▪ Minimum $50 Additional fees for reviewing ▪ Minimum $50 for inspections	
Ohio		The legislation relates to municipalities only

State	Small Wireless Facilities	5G Facilities
Oklahoma		The legislation relates to municipalities only
Pennsylvania	▪ $50 for permit application ▪ $10 to $80 Permit inspection	
Rhode Island		Fees must be reasonable and associated with the direct and actual costs incurred by the department
Tennessee	Application Fee: $200 base fee + $10 per each mile (fiber optic)	▪ $100 per small wireless facility for the first 5 facilities and then a maximum of $50 for each additional facility. ▪ No charge for an application fee or annual collocation fee
Texas		The legislation relates to municipalities only
Utah	Fair and reasonable, competitively neutral, nondiscriminatory	Right-of-Way Rates: ▪ Not to exceed 3.5% of gross revenue related to wireless providers usage of ROW or; ▪ $250 annually/small wireless facility Application Fees: ▪ Application fees cannot exceed $250 for permitted use and $1,000 for non-permitted use. ▪ Collocation on an authority pole is $50 per year per pole. ▪ $100 per facility collocating on an existing or replacement utility pole.
Vermont	▪ $100 for a utility installation. ▪ $500 annual blanket permit for routine inspection and maintenance ▪ Impact fee for access to the ROW	
Virginia	▪ Public Rights of Way Use Fee using Formula ▪ No annual fee for small cell ▪ $150 for a single-use permit	▪ $150 for a single-use permit ▪ No charge for an annual fee
Washington	▪ Category 1 $500. ▪ Category 2 $300. ▪ Category 3 $150. ▪ Franchise consolidation $300. ▪ Franchise renewal $250. ▪ Franchise assignment $50.	
Wisconsin	Allows in-kind compensation	

Kraus, et al. focused on three types of communications facilities in their study: longitudinal communications lines, macro-cellular towers, and microcells. The research found that 25 states out of 42 generate some type of revenue or benefit from communications utilities using the rights-of-way. From those 25 states, there are16 states that generate revenue from longitudinal communications lines. This type of revenue either involves an annual fee (nine states) or resource sharing agreements (nine states). Nine states out of eleven generate value as annual fees or generate revenue through revenue/resource

sharing regarding macro-cellular towers. The third type of communications facility is microcells, where ten states out of eighteen generate value in rights-of-way. The type of revenue varies from an annual fee, one-time fee, and resource or revenue sharing. In addition, two states reported that they generate revenue from wireless support structures in their state rights-of-way (2020).

The research team also found value in reviewing two surveys conducted by other agencies whose results are publicly available (AASHTO, 2005 and NTIA, 2006). A survey conducted by the California Department of Transportation queried other DOTs regarding compensation approaches for accommodating telecommunications in controlled access ROW. There were 18 states who responded and presented varying compensation approaches. The results are to be updated through the survey of this research, but the line of questioning influenced the survey presented later.

Authorization to locate utility facilities in the public right-of-way is dependent on the legislation in each state. The National Telecommunications and Information Administration prepared another survey of ROW statutes for the 50 states with the addition of data from the National Association of Regulatory Utility Commissioners and the National Association of Telecommunications Officers and Advisors. An excerpt from this survey is seen in Table A.2. This survey also influences this effort during the review and organization of policy and legislation.

Table A.2 Excerpt from a survey of ROW statutes

State	Jurisdiction, Terms of Agreement (except fees)	Compensation	Timelines	Nondiscrimination	Mediation	Condemnation	Remediation & Maintenance
Ohio	Ohio Rev. Code Ann. § 4939.01 - 4939.09 (Anderson 2002); § 4939.02: Ohio's policy regarding rights-of-way grants authority to municipalities to manage rights-of-way, ensures lawful fee recovery, and promotes municipal coordination and standardization.	Ohio Rev. Code Ann. § 4939.05 (B) (Banks-Baldwin 2002): Municipalities may charge different fees for the use of their rights-of-way, based on the amount of public land used, the type of public utility, or any other different treatment justified by public health and safety concerns. This includes a complete waiver of the fee.	Ohio Rev. Code Ann. § 4939.03(C) (Anderson 2002): Municipalities must approve or deny applications within 60 days of receipt.	Ohio Rev. Code Ann. § 4939.04 (Anderson 2002): Municipalities shall provide access to rights-of-way on a competitively neutral and nondiscriminatory basis.	Ohio Rev. Code Ann. § 4939.06 (Anderson 2002) "Public utility may appeal fee. (A) If a public utility does not accept a public way fee levied against it pursuant to the enactment of an ordinance by a municipal corporation, the public utility may appeal the public way fee to the public utilities commission."		
	Ohio Rev. Code Ann. § 5571.16 (Anderson 2002): Municipalities may require a permit to excavate below local roads except where such excavation is necessary to repair a facility already in place.	Ohio Rev. Code Ann. § 4939.05 (C) (Banks-Baldwin 2002): Fees charged may only reflect actual costs of managing the rights-of-way, plus any demonstrable future costs. Ohio Rev. Code Ann. § 4939.05 (A) (Banks-Baldwin 2002): Ohio prohibits the use of in-kind services in lieu of fees.		Ohio Rev. Code Ann. §4939.04 (Anderson 2002): "(2) Nothing in division (A)(1) of this section prohibits a municipal corporation from establishing priorities for access to or occupancy or use of a public way by a public utility or cable operator when the public way cannot accommodate all public way occupants or users, which priorities as applied to public utilities or cable operators shall not be unduly discriminatory and shall be competitively neutral."			

The literature does not contain much information on fees charged for non-communication utility installations in the public right-of-way. However, additional references to fees charged for the installations of telecommunication in ROW do exist. For example, Wilmot (1995), for the DOT in Louisiana, conducted a study to investigate the feasibility of fiber-optic placement in Interstate ROW. While the main impetus seems to be a concern of safety, the study does survey state DOTs regarding compensation for accommodations within ROW. At the time of the study, 74% of their respondents noted they did not charge for accommodations. The average compensation level for the four state DOTs who did charge for accommodations, was $4945/mile/year for urban, and $1282/mile/year for rural freeways. It is noted within the report that Louisiana did charge for attachments of utilities on their structures in a rental fee, and they had recently adopted a fee structure for accommodating utilities within their ROW. Though modest, these fees were based on the number of customers served, as seen in Table A.3.

Table A.3 Louisiana Utility Accommodation Fees in 1995

Number of customers	Maximum annual fee
0-100	$20
101-500	$50
501-6000	$200
>6000	$700

Louisiana commissioned a second research effort similar to their previous study mentioned and by the same principal investigator. The report documents an investigation of the location of telecommunication towers and fiber-optic cable in the highway right-of-way. In this study, Wilmot (1998) synthesis focused on installation of wireless facilities in highway right-of-way in Louisiana, and much of the material as previously mentioned from the *Shared Resource* documents. This work did provide fee approaches from various states and entities, such as shown in Table A.4 and A.5. Table A.4 provides fees charged for accommodation on National Forest Land in 1998. The total fees are charged according to population served by the tower.

Table A.4 Annual Payment for Telecommunication Sites on National Forest Land (Wilmot, 1998)

	Annual Payment (1998)		
Population	**Cellular telephone**	**Private Mobile Radio Service**	**Microwave**
5m plus	$12,631.92	$10,526.60	$10,526.60
2.5m - 5m	$10,526.60	$6,315.96	$8,421.28
1m - 2.5m	$8,421.28	$6,315.96	$7,368.62
0.5m - 1m	$6,315.96	$4,210.64	$5,789.63
0.3m - 0.5m	$5,263.30	$2,631.65	$2,631.65
0.1m - 0.3m	$4,210.64	$2,105.32	$2,105.32
0.05m - 0.1m	$3,157.98	$1,052.66	$1,578.99
0.025m - 0.05m	$2,631.65	$631.60	$1,578.99
<0.025m	$2,631.65	$368.43	$1,578.99

Table A.5 shows fees for the longitudinal use of highway right-of-way for fiber-optic cable charged by various states according to location and adjacent facility type. The tables shows some variation in fees due to the differences in land value from site to site, location, and the facility type (FHWA, 1996). In comparison to this data, Wilmot, (1995) conducted a survey among state DOTs and found that in the

urban locations, the average fee charged to accommodate fiber-optic cable in controlled-access highway right-of-way was approximately $5,000 mile/year and $1,300 per mile per year in rural locations.

Table A.5 Fees charged for fiber-optic cable in highway ROW (FHWA, 1996 & Wilmot, 1998)

		Fees charged for the accommodation of fiber-optic cable in highway right-of-way ($/mile/year)					
State	**Facility type**	**Rural**		**Suburban**		**Urban**	
		Median	**Edge**	**Median**	**Edge**	**Median**	**Edge**
Florida	Turnpike	$736[a]					
Georgia	non-Interstate highways		$1,000-$2,000[b]				$5,000[b]
Illinois	Toll road				$1,500		
Iowa	Highways	$1,500[c]				$4,500[c]	
Indiana	Toll road	$1,800 + capacity[d]					
Massachusetts	Turnpike					$5,000-$7,500	
New York	Thruway				$5,280		
Ohio	Turnpike	$1,600-$1,850 + capacity[d]					

Note:

[a] *Fees no longer apply because DOT has taken over this roadway and cannot charge fees.*

[b] *Actual rate in rural areas depends on average daily traffic; fees are considered reimbursement for administrative costs, including permitting and insurance factor.*

[c] *The Iowa DOT reserves the right to negotiate the fee charged for occupancy dedicated solely to state governmental use (Iowa Accommodation Policy, '115.24(12)(c).*

[d] *These are the rates negotiated in 1985 with Litel; contract gives the Turnpike the option of free utilization of a stated amount of capacity at any time in the future.*

Wilmot, (1998) also found that three-quarters of the states (75%-81%) who charge fees receive compensation for use of DOT property in cash payments. The other quarter receives shared resources as a means of compensation. Payment varies widely among states. In some states, both one-time and annual payments are required, while other states only require either a one-time payment or annual payments. Variation in fees within states also occurs. This is presented in Table A.6, where the fees for the installation of a tower in the ROW varies by both the tower location and the number of antennas the tower is designed to carry (Wilmot, 1998). Table A.6 shows these factors in both California and Ohio.

Table A.6 Annual Site License Fees in California and Ohio (Wilmot, 1998)

State DOT	Tower Type						Notes	Geographical Areas	Site License Fees			
	Microcell		Minicell		Macrocell				Type	Microcell	Minicell	Macrocell
	EquipmentS	Area required	EquipmentS	Area required	EquipmentS	Area required						
California	Up to 3 antennas	< 300 Square feet	Between 4 and 8 antennas	>= 300 and <=500 Square feet	Between 9 and 16 antennas	>500 and >2,500 Square feet	Any sites exceed this specification of a "microcell" the fees are negotiated on an individual basis.	Prime Urban	Annual	$15,000	$18,000	$21,000
								Urbanized	Annual	$12,000	$15,000	$16,200
								Rural	Annual	$9,900	$12,000	$12,000
Ohio	Between 1 and 4 antennas and hav omni and directional antennas up to 8 feet in height	Up to 300 Square feet	5 to 9 antennas, directional antennas up to 6 feet in height and omni-directional towers up to 17 feet in height	up to 525 Square feet	10 to 16 antennas, directional antennas up to 6 feet in height and/or omni-directional towers up to 17 feet in height	up to 750 Square feet	If a facility does not fit within the This categories , fees are established by negotiation. The fee schedule automatically increases by 3.5% per year	Urban	Annual	$14,000	$17,000	$22,000
								Suburban	Annual	$12,000	$15,000	$18,000
								Rural/Suburban	Annual	$8,000	$13,000	$14,000
								Rural	Annual	$8,000	$10,000	$11,000

Wilmot developed recommended fees for telecommunication towers for Louisiana based on his research (1998). The fee structure uses an annual fee approach and uses one-year contracts that are annually renewable depending upon Louisiana existing legislation. The variation in the fees is dependent on location and the type of tower. The recommended fees are presented in Table A.7.

Table A.7 Recommended fees for telecommunication towers (Wilmot, 1998)

Type of tower	Location		
	Urban	Suburban	Rural
Self-supporting tower	Tower owner: $25,000/site/year Additional service provider: $15,000/attachment/yr.	Tower owner: $15,000/site/year Additional service provider: $10,000/attachment/yr.	Tower owner: $10,000/site/year Additional service provider: $7,000/attachment/yr.
Monopole	Tower owner:	Tower owner:	Tower owner:

	$15,000/site/year Additional service provider: $7,000/attachment/yr.	$10,000/site/year Additional service provider: $5,000/attachment/yr.	$5,000/site/year Additional service provider: $3,000/attachment/yr.
Small attachments to existing utility poles	$5,000/attachment/yr.	$4,000/attachment/yr.	$3,000/attachment/yr.

Postil (2007) completed a study recommending franchise fees for various utilities occupying Pima County ROW in Arizona. Pima County is authorized to charge fees for utilities using ROW under statute A.R.S. §11-251.08 according to Ordinance No.2004-19. This ordinance, updated in 2010, entails a fee schedule for processing applications for various utilities, as seen in Table A.8.

Table A.8 Utility Fee Schedule in Pima County rights-of-way (Ordinance No.2004-19)

Type of Utility	Description	Fee Schedule
Roadway Abandonment	Application for abandonment	$5,000
Sewer Easement Release	Release of easement for installation, maintenance, and use	$250
Utility Easement Release	Coordinate release of easements by utility companies	$300
Construction Easement Release	Formal release of easement for construction	$300
Access Control Release	Release of access control	$850
Drainage Easement Release	Release of drainage easement	$1,200
Cable TV License	License for the installation, maintenance, and operation	$7,500
	Renewal of an existing license	$7,500
	Assignment of an existing license	$1,000
Fiber Optic Lines	License for the installation, maintenance, and operation	$3,000
	Renewal of an existing license	$1,980
	Assignment of an existing license	$1,000
Wireless Communications	License for the installation, maintenance, and operation	$2,600
	Renewal of an existing license	$1,700
	Assignment of an existing license	$1,000
ROW Encroachments	License for encroachment	$2,900
	Renewal of an existing license	$500
	Assignment of an existing license	$300
Monitor Well License	License for the installation, maintenance, and operation of a groundwater monitor well	$2,500
	Renewal of an existing license	$1,650
	Assignment of an existing license	$1,000
	Installation of an additional well	$1,250
Private Utility Lines	License for the installation, maintenance, and operation of electrical or other utility lines	$2,400
	Renewal of an existing license	$1,580
	Assignment of an existing license	$600
	Installation of an additional lines	$1,200
Road Conversion	Application for conversion of a road from private to public	$3,500

Postil's study developed a recommended utility fee schedule, licenses, and franchises for Pima County, Arizona. The methodology used to develop the fee schedule is consistent with other studies though there are some gaps, such as not including land value. As seen in Table A.9, the fee structure includes in-kind contributions or linear foot fees, with some utilities having per month fees. The fees are based on actual costs, but do not include repair, relocation, permits, disruption, application, planning, or zoning fees. The approach recommended fees schedule is aimed at being fair, reasonable, and consistent with Federal, State, and local laws and policies (2007).

Table A.9 Recommended Utility Fee Schedule for Pima County (Postil, 2007)

Utility	Fee
Electric	▪ $1.00 -$1.80 per linear foot. ▪ In-kind contributions (under grounding) ▪ Adjusted every five years
Natural Gas	▪ $1.00 per linear foot ▪ Adjusted every five years
Water and Sewer	▪ Per Intergovernmental Agreement
Competitive Local Exchange Carriers	▪ $1.00 per Linear foot less in-kind for four (4) dark fibers ▪ Adjusted at the end of the license term
Cable Television	▪ 5% of gross revenues
Cell Towers/Wireless	▪ $1,000 per month per site. ▪ Up to one hundred square feet. ▪ Non-right of way locations minimum of $1,000 per month per site.
Long Distance	▪ $1.00 per linear foot ▪ Adjusted at the end of the term
Phone	▪ $1.00 -$1.80 per linear foot less in-kind (under grounding) ▪ Adjusted for inflation every five years

Section 253 (a) of the Telecommunications Act of 1996 encourages states and other public authorities to permit the use of highway right-of-way for telecommunications service. State or local authorities cannot prohibit the provision of accommodation to telecommunications services unless the safety of highway travelers or the flow of traffic is significantly affected. In these circumstances, Section 253 (b) of the Act is clear that state and local authorities have the right to decline a permit application. In 1997, the Louisiana State Legislature set permit fees for locating utilities in highway right-of-way in Louisiana. The annual fees range from $20 to $1,500 for highways without access control. For controlled-access highways, fiber-optic cable installation requires an unspecified one-time flat fee for each permit (Wilmot, 1998).

The literature review provided extensive background on compensation and valuation approaches largely for telecommunications accommodations. The methodology appears transferrable as shown in Postil's study in 2007. Beyond the literature reviewed, there was a need to collect and review the legislation and policies of individual states.

Legislation and Policy Investigation

The purpose of collecting legislation and policy is to identify statutory and regulatory standards for utility and communication facility accommodations and their associated accommodation approaches, including fees, property valuations, charges, or alternative accommodation, such as service bartering. Along with reviewing relevant literature, the research team has found the review of DOT policy and procedure

manuals to be very insightful. While these manuals do not always represent the most up-to-date practices by the DOTs, they do often capture effective practices and present how DOT processes may differ or be similar. Through this investigation of legislation and policy, it was found that states' approaches to compensation and associated valuation of utility accommodations varies significantly. Variation often also exists within a singular state's policy according to access control, utility type, population served, and other factors.

In 1988, federal regulations allowed states to establish their own utility accommodation policies and procedures. The accommodation rule or policy is central source of information regarding utility procedures in most states. Many states have used AASHTO guides approved by FHWA as the model for their policies and procedures on utility accommodation. Some have used the exact language of these guides, while others have made modifications to meet their local needs. Accommodation policy varies from state to state depending on the state legislation and state needs (NCHRP 34). Many state DOTs use these policies and procedures in combination with additional documents, such as their utility manual, permit manual, FHWA utility guide, and the current AASHTO accommodation policy (Kraus, 2014). Because there is so much variation, it was important to conduct a thorough review.

The investigation of state legislation and policy manuals allowed for the collection and summary of practices organized within a spreadsheet. This spreadsheet forms the basis of the decision support tool of the research.

The policy and legislation collection was organized according to the following categories for each state:

- Definition of a utility and general information, including variations among public and private owners, ROW, and access control. Also, included are descriptions of utility types, DOTs authority for charging fees, and policy on abandoned facilities;
- Utility relocations and reimbursement policies;
- Permit and fees structure, including utility permit policy, processes, permits types, fee structure, structural attachment policy; and
- Accommodation and compensation policy including policies on co-location, shared use, leasing, in-kind compensation, Dig Once, Joint Use, other compensation, jurisdiction, authorization, restrictions, and agreements.

The researchers reviewed federal regulations, state legislation, and policy frameworks that guide states to compensate for accommodating utility and communications installations in public rights-of-way. Researchers gathered information from the 50 states to find an answer to the following questions:

- What is the revenue generation category for each state DOTs for utility accommodations in rights-of-way?
- What are the accommodation mechanisms used by state DOTs?
- What are the compensation methods used by state DOTs?
- What are the compensation structures for state DOTs?
- What are the valuation approaches used by state DOTs?
- What are the scheme approaches used by state DOTs?
- What state DOTs, if any, charge fees to public (government) utilities?
- What are the legislations, regulations available at the state that authorize or restrict the state's ability to generate revenue from the accommodation's utilities in rights-of-way?

The findings from this investigation were corroborated with information collected from the study survey and the case study interviews. The extensive collection of legislation and policy as organized by state and content will serve as background for the framework categorization developed. The information collected was for both general utility accommodations and telecommunication accommodations. As evident, there is substantially more information and variation available relating to telecommunications accommodations than utilities in general. The collection of legislation and policy related to the valuation and compensation for accommodating utility and communications installations in public rights-of-way for each state is summarized and included in Appendix A.

APPENDIX B

Survey to State Departments of Transportation

Following the initial review of literature and definitions, a survey questionnaire was developed to investigate compensation and valuation approaches of state DOTs. The survey was initially distributed to the voting membership and utility associated members of the American Association of State Highway and Transportation Officials (AASHTO), Committee on Right of Way, Utilities and Outdoor Advertising Control (CRUO). The survey was first sent on May 13, 2021, with responses initially request by May 28, 2021. Though reminders were sent to request additional responses, the initial response rate was 23.5 percent (12 DOT responses out of the 51 DOTs contacted). The research team requested an extension for the planned deliverables in order to collect additional survey responses. The survey was closed on June 21, 2021, with a final the survey response rate of 41.2 percent (21 DOT responses out of the 51 DOTs contacted). The responses included 31 total respondents with several state DOTs having portions of the survey divided among respondents. Further, the research team had to work to merge these responses with some follow-up contact with state DOTs prior to analyzing the data. The following presents the final findings of the survey. The focus areas of the survey involved accommodation fees, valuation approaches, any associated variations, and legislation or policies involved. The survey questionnaire is included as Appendix B.

The initial question of the survey sought to understand how various utility types were considered by the state DOT respondents, in regard to their status and legal definition. As seen in Figure B.1, it was notable to find that the largest variation occurs in the telecommunications areas, inclusive of cable television, telecommunication/telephone, small cellular, and macro telecommunication towers. Few states seems to legally define cellular structures as a utility. The purpose of this question was to assist in analysis and categorization. While informative, the question was not as valuable as intended due to the vast reduction of responses that occurred due to the low number of state DOT respondents who charge fees, especially fees beyond a permit fee. In fact, only eight respondents (38%) noted that permit fees were charged, as seen in Figure B.2.

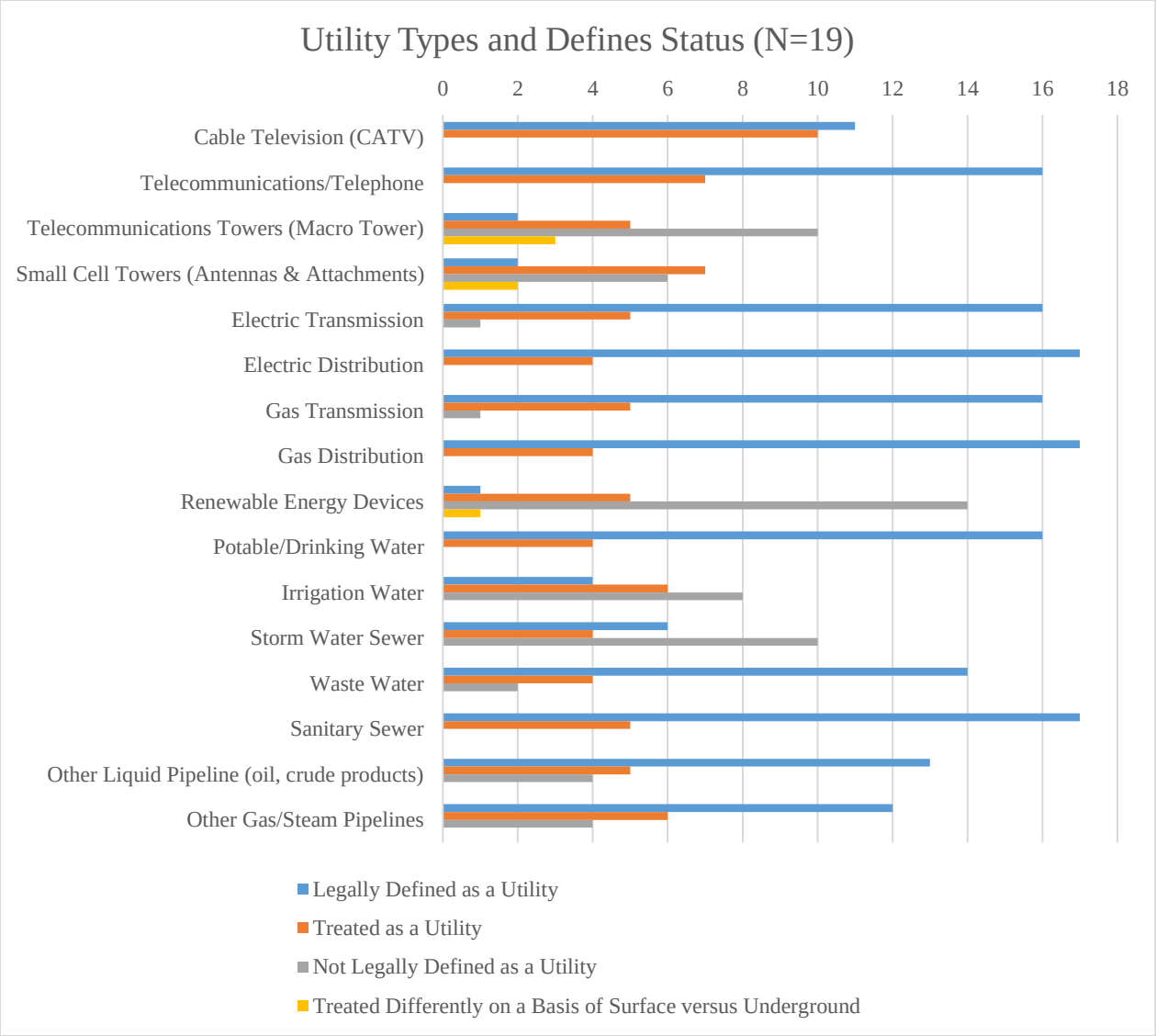


Figure B.1 Utility Types and Defined Status

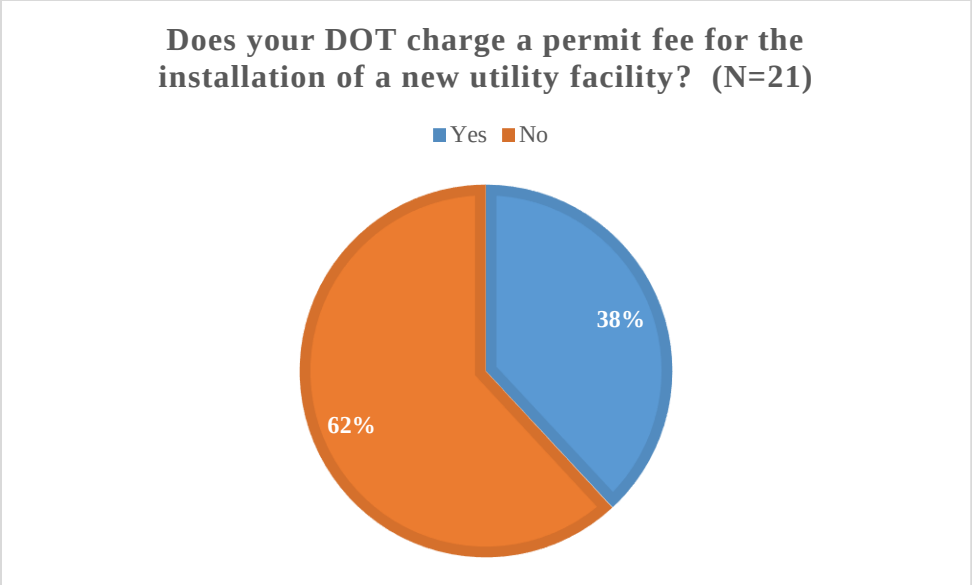


Figure B.2 State DOTs Charging Installation Permit Fees

The next series of questions involved further understanding of the permit fees that were being charged. Figure B.3 presents at what frequency those fees are charged, with the "Other" responses indicating the fees varied by a host of factors which were discovered in remaining survey questions and noted in Figure B.4.

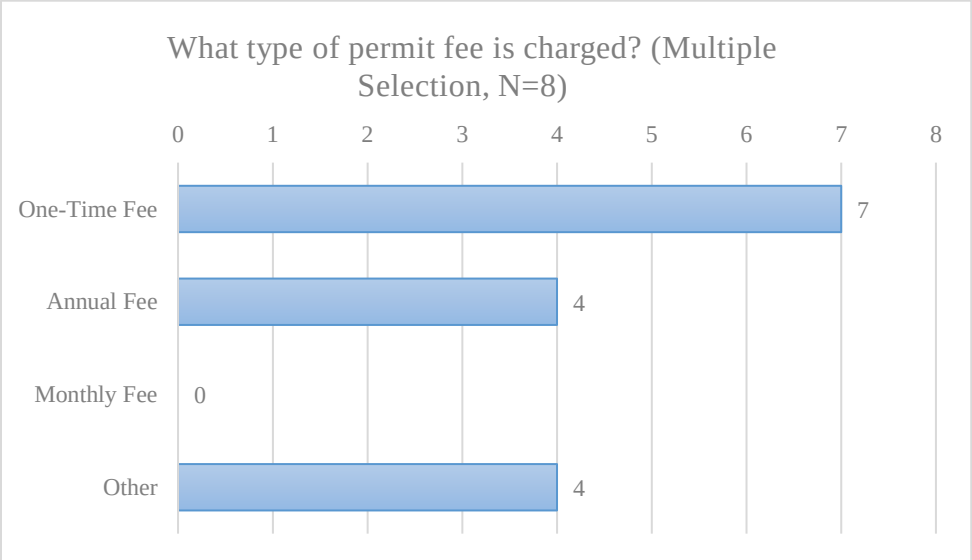


Figure B.3 Permit Fee Frequency Type for New Installations

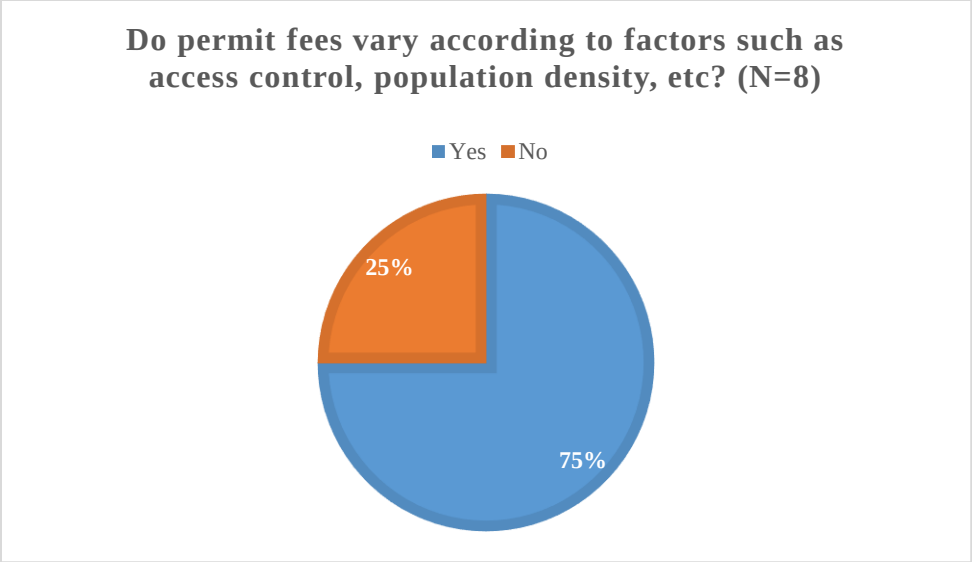


Figure B.4 Variation of Permit Fees

The next question sought to discover the valuation methods used to set the permit fee for the state DOT. These results are presented in Figure B.5, with the "Other" responses predominantly indicating the state DOT did not charge a fee, even if allowed. It was also noted that some fees were legislatively established and were based on an unknown valuation approach.

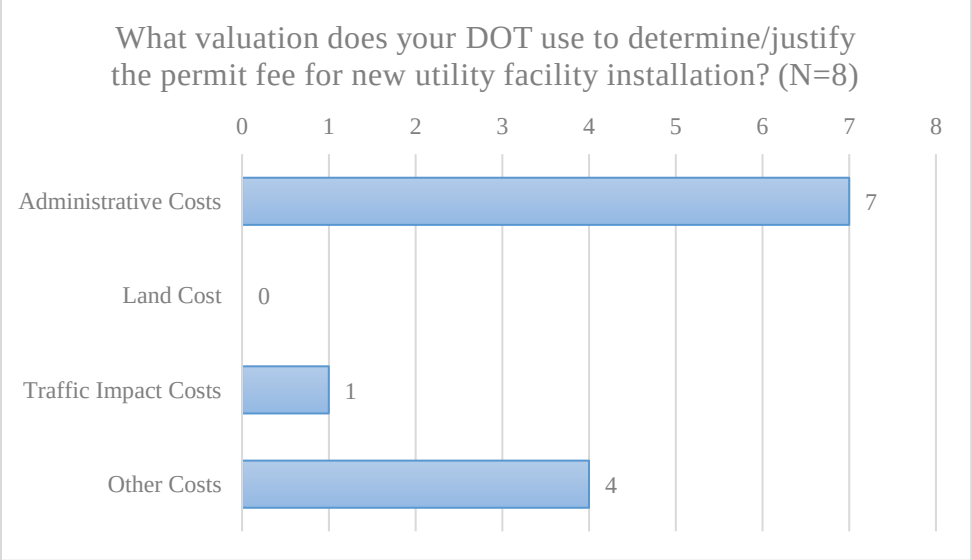


Figure B.5 State DOT Permit Fee Valuation Approach

The next few questions concerned other fees applied, such as for maintenance of facilities (including the associated valuation of that fee), or attachments on structures. These responses are presented in Figures B.6, B.7, and B.8 respectively. It was noted that structural attachment fees may vary by many factors including costs of performing an engineering analysis and weight of the accommodated utility. In Figure B.7, the "Other" responses indicated fees were not charged for maintenance.

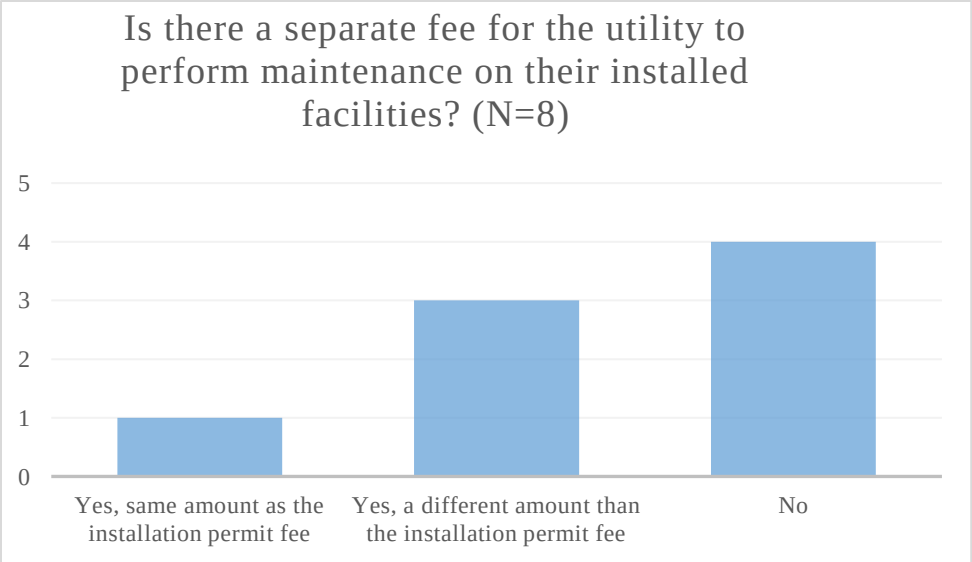


Figure B.6 State DOT Fees for Utility Maintenance or Service

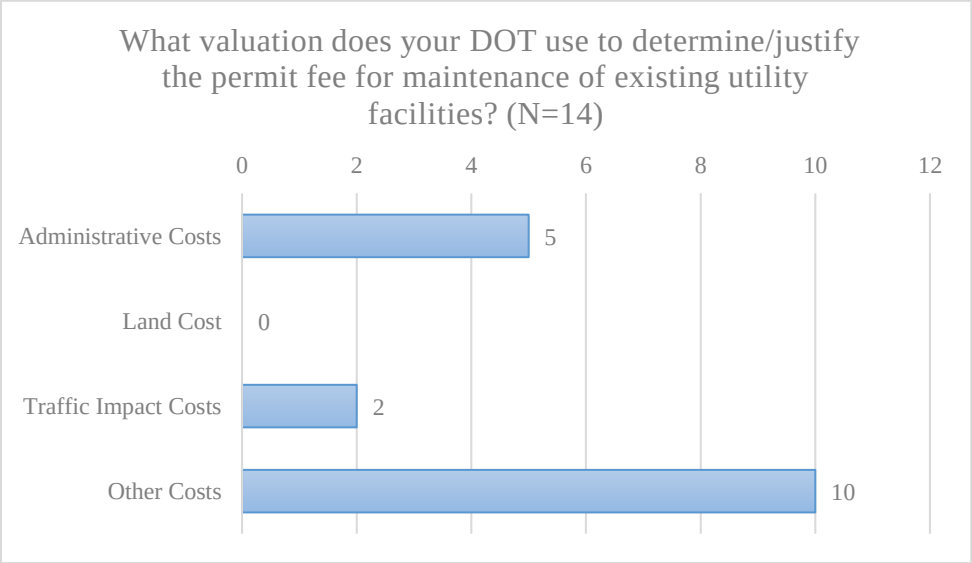


Figure B.7 State DOT Valuation Approach for Utility Maintenance Fees

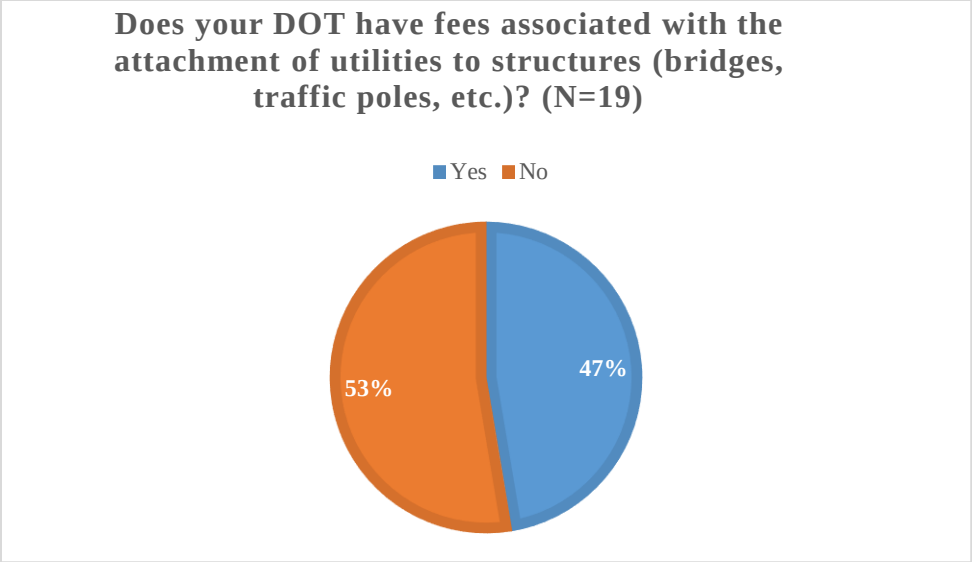


Figure B.8 State DOT Utility Fees for Attachment to Structures

There was also an inquiry regarding any fees associated with abandonment of utility facilities. All 21 state DOT respondents noted that there were no fees charged for utilities abandoning or leaving out-of-service infrastructure in the state DOT right of way.

The next series of questions intended to identify state DOTs who were charging fees beyond standard installation permit fees. As noted in Figure B.9, only six (29%) of the 21 survey respondents indicated they did so. These state DOTs included Iowa, Maryland, Tennessee, Texas, Utah, and Washington. Five of these states responded as to what utilities are charged these additional fees as seen in Figure B.10, with "Other" responses indicating one state charges fiber optic facilities only on interstate right of way, and another indicated fees were charged to owners of saltwater facilities related to fracking.

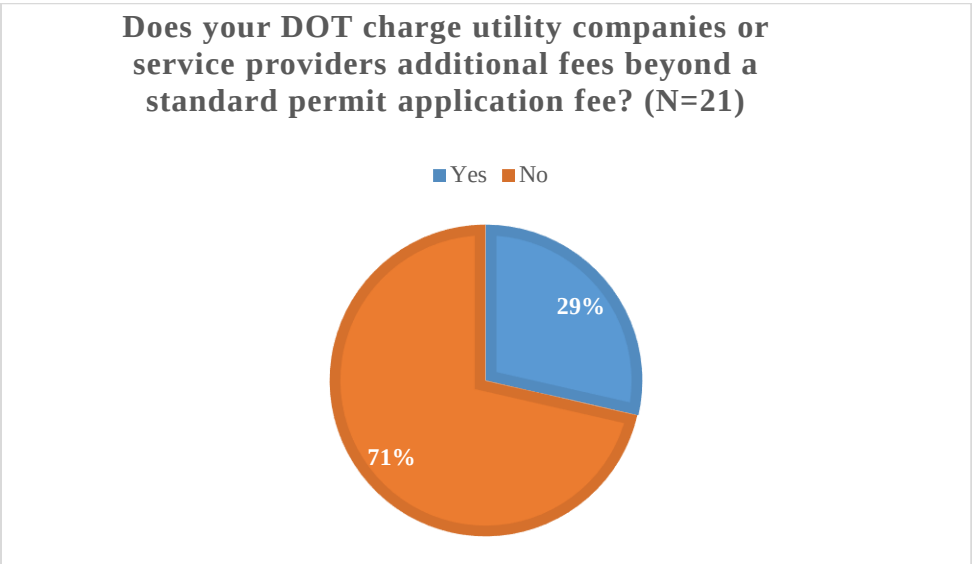


Figure B.9 State DOTs Charging Additional Fees beyond Permit Fees

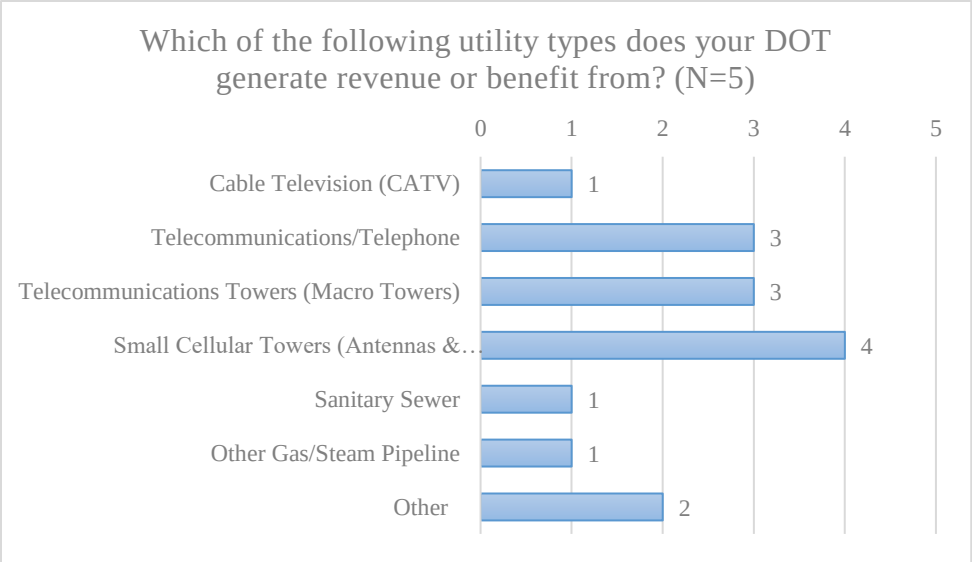


Figure B.10 Utility Types Charged Additional Fees

The results next presented discuss the fee structures implemented by state DOTs to assess accommodation fees to the utilities. While there is a low number of responses to these questions, they offer support to the state DOT categorization approach presented in Chapter 4, in that the structure needs to account for variation in fee approaches and variation by numerous facility factors. The responses to these questions are presented in Figures B.11, B.12, and B.13.

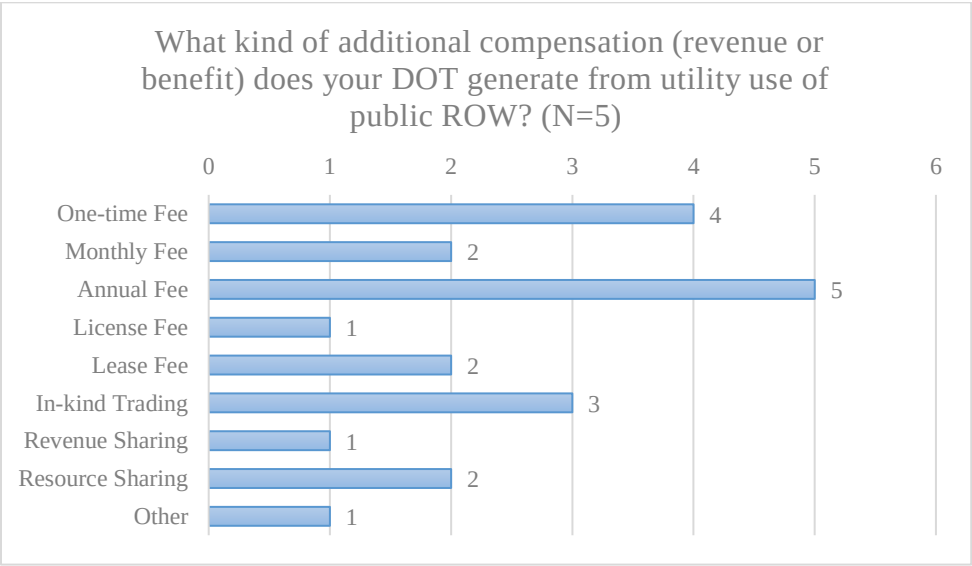


Figure B.11 Fee Types for Addition Charges to Utilities

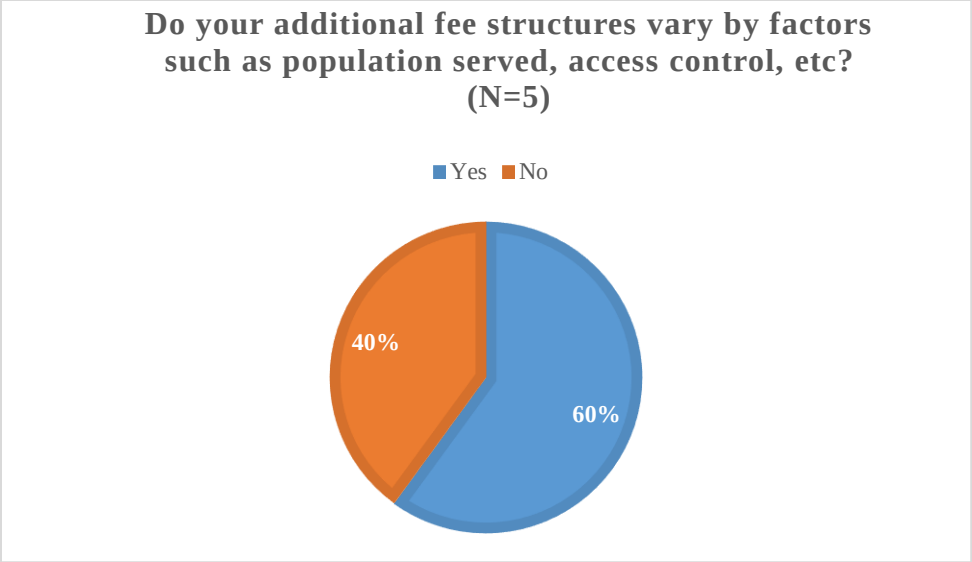


Figure B.12 State DOT Variation in Additional Fees

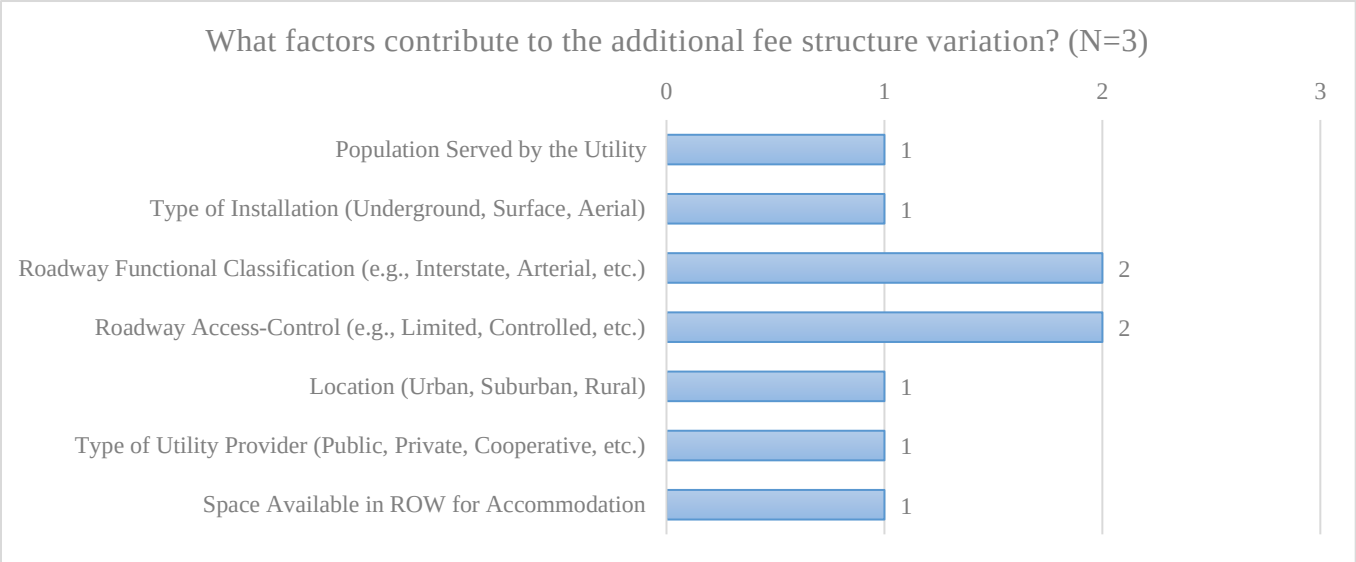


Figure B.13 Factors by which Additional State DOT Utility Fees Vary

As a follow up question regarding the ability to charge additional fees, respondents who indicated they did not charge additional fees were asked if they were prevented from doing so by statute. As seen in Figure B.14, nearly half of the state DOTs who are not charging additional fees to utilities, currently do not have the legislative authority to do so.

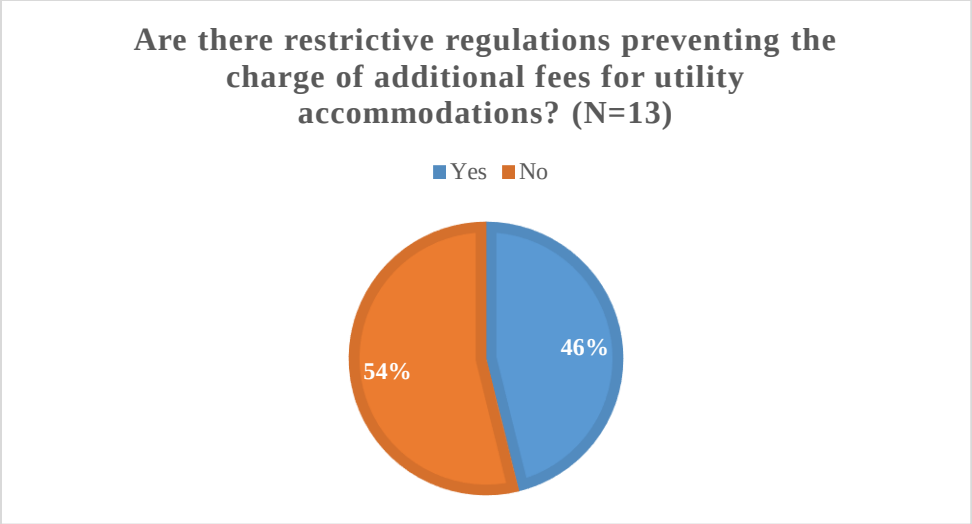


Figure B.14 State DOTs Restricted from Charging Additional Compensation Fees

The next several questions sought to determine if there were differences in the fees applied to surface or aerial utility installations and those installed underground. As shown in Figures B.15 and B.16, it does appear that there is some difference in the application approach to surface or aerial fees when compared to underground fees. The underground fees may be more length oriented, thought there are not a significant number of responses to support that assertion. The “Other” responses involved fees that were set by legislation or singular flat fees without variation. The comparison of valuation approaches for surface or aerial facilities compared to underground facilities is shown in Figure B.17 and Figure B.18 with little variation.

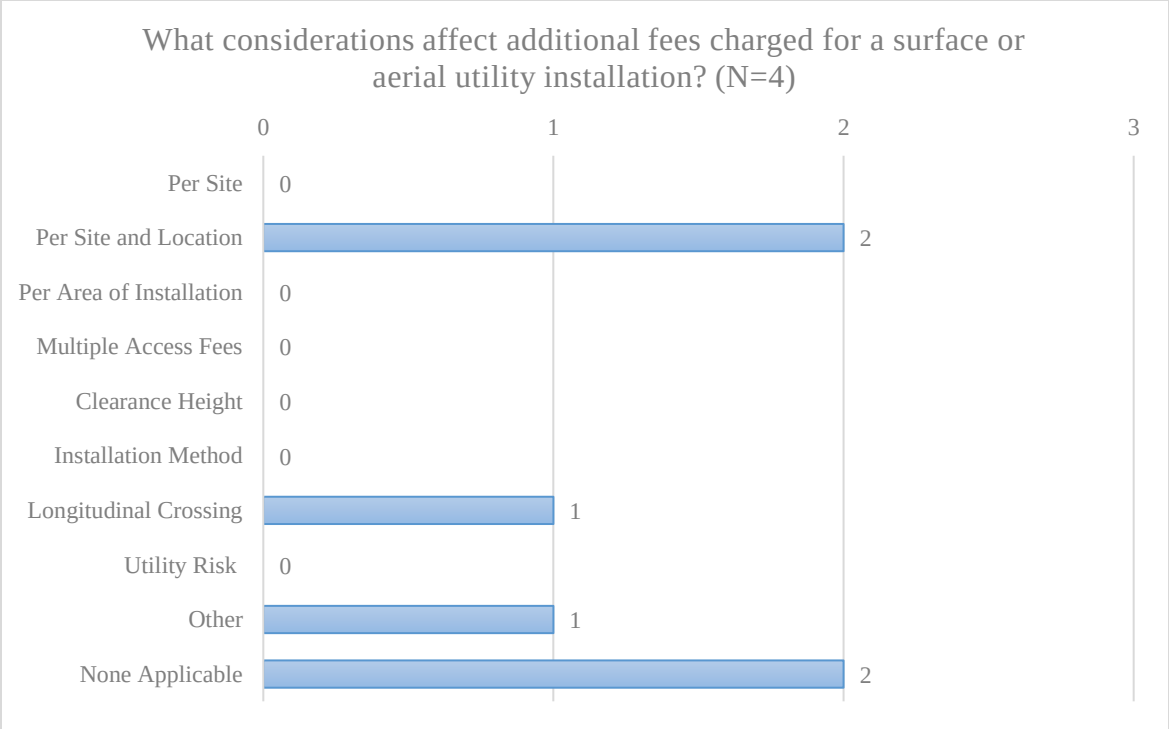


Figure B.15 Variation of Surface or Aerial Facility Fees

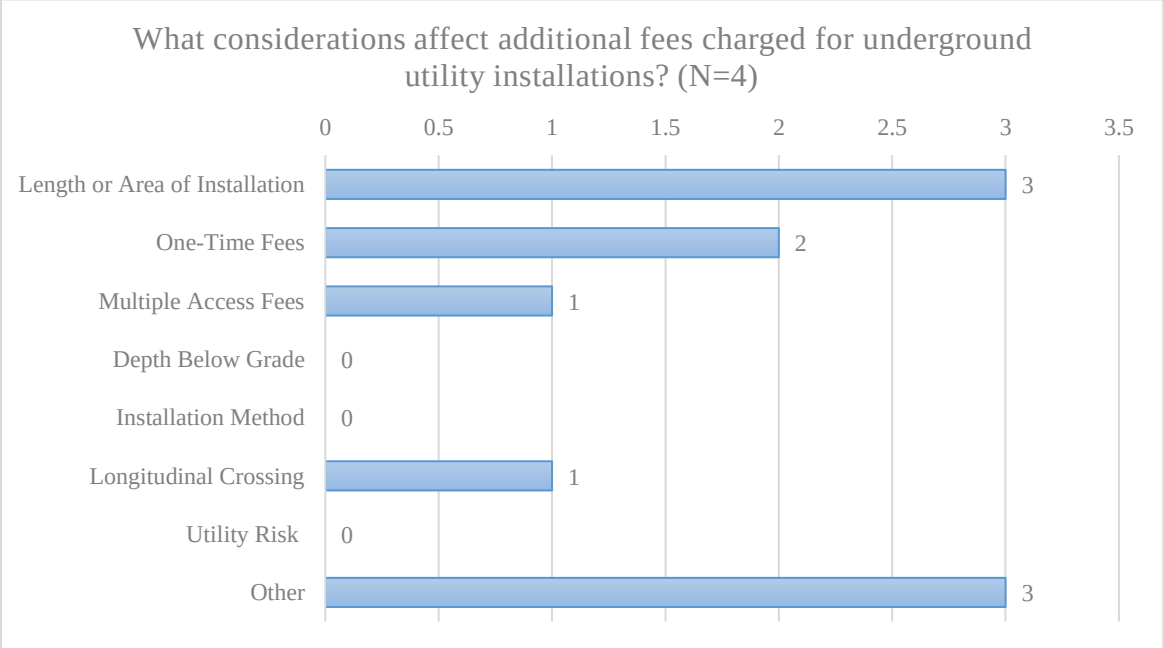


Figure B.16 Variation of Underground Facility Fees

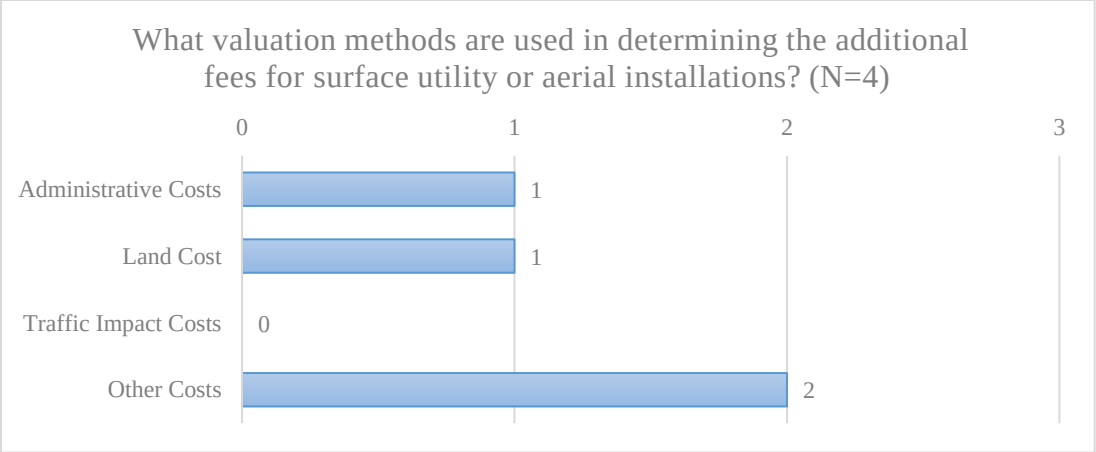


Figure B.17 Valuation Methods of Fees for Surface or Aerial Utilities

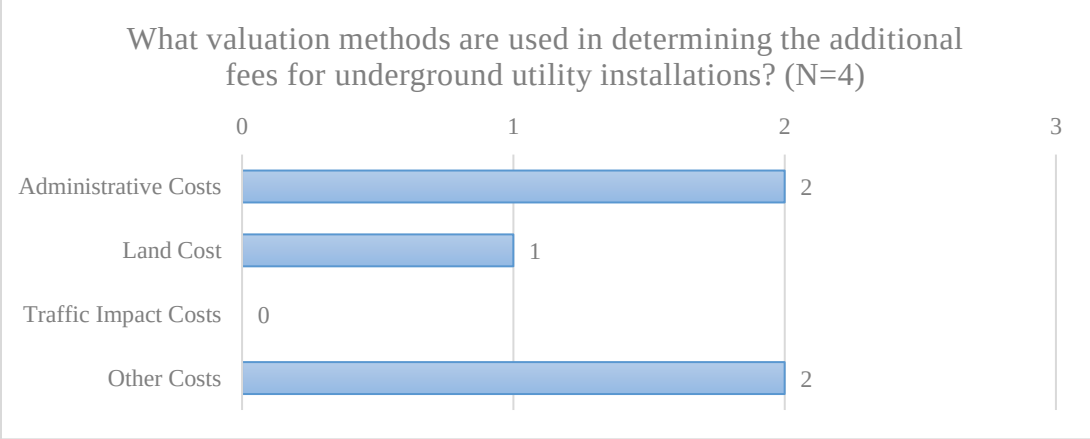


Figure B.18 Valuation Methods of Fees for Underground Utilities

The next series of questions within the survey concerned several policies that state DOTs may have in place that could affect fees and valuation methods. First, respondents were asked if they could retroactively charge fees to those utilities accommodated prior to their current compensation policy. The result was a unanimous response (N=4) indicating that was not possible. Respondents were also asked to select which utility owners could be charged additional fees (public, private, or non-profit). Again, the responses were unanimous (N=3) in noting only public utilities were charged the additional fees.

Other policies queried included joint use requirements, resource sharing, leasing, and the installation of isolated poles for small cell devices. The results from this questions are found in Figures B.19, B.20, B.21, B.22, B.23.

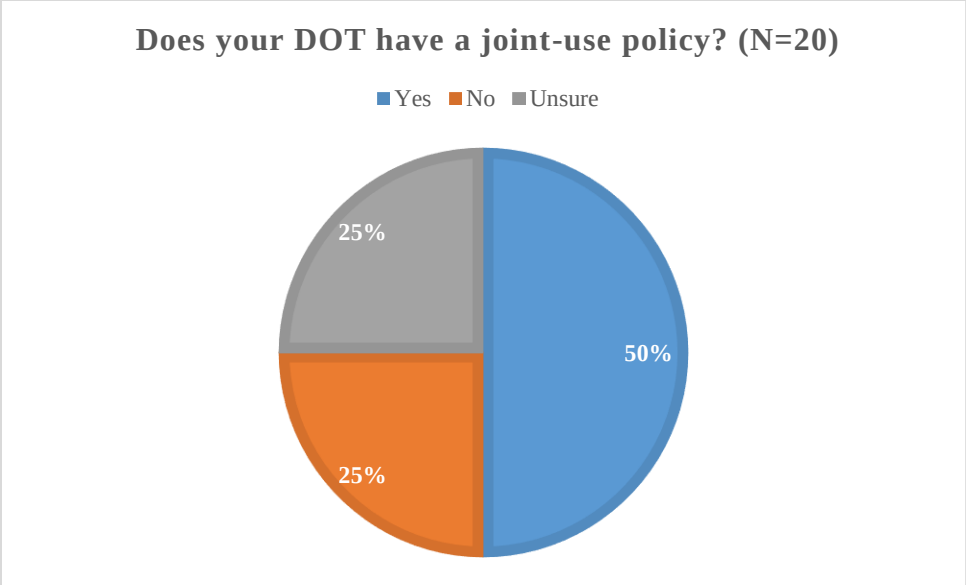


Figure B.19 State DOTs with Policies on Joint Use Trenches

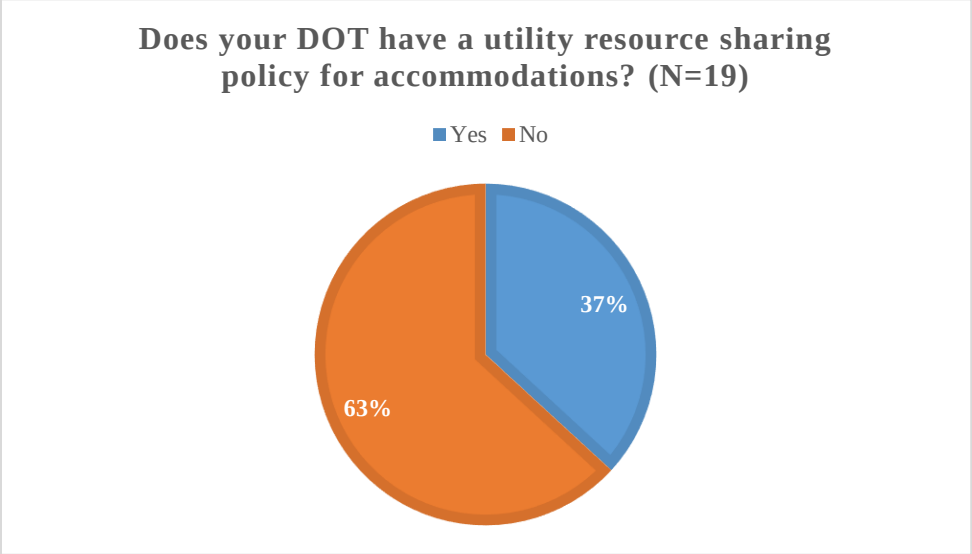


Figure B.20 State DOTs with Policies on Resource Sharing

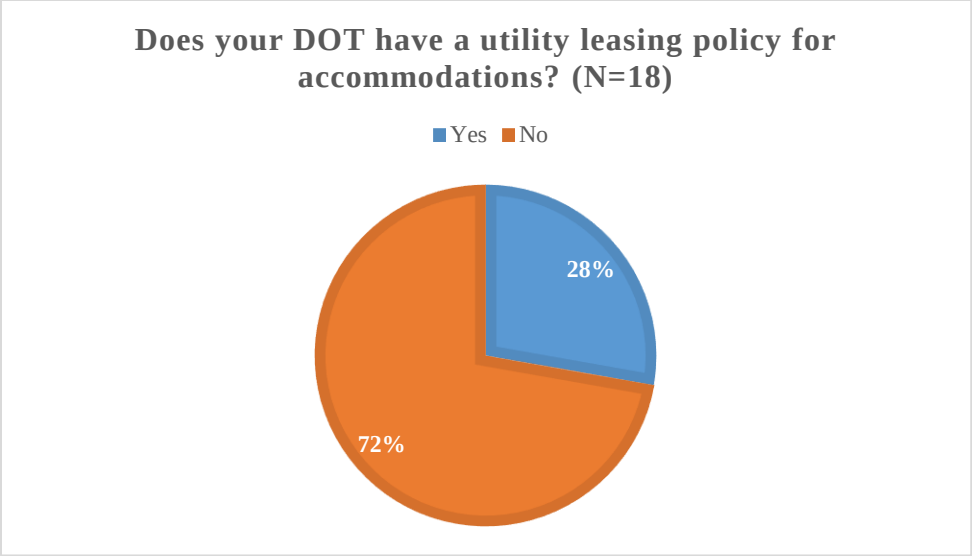


Figure B.21 State DOTs with Policies on Leasing

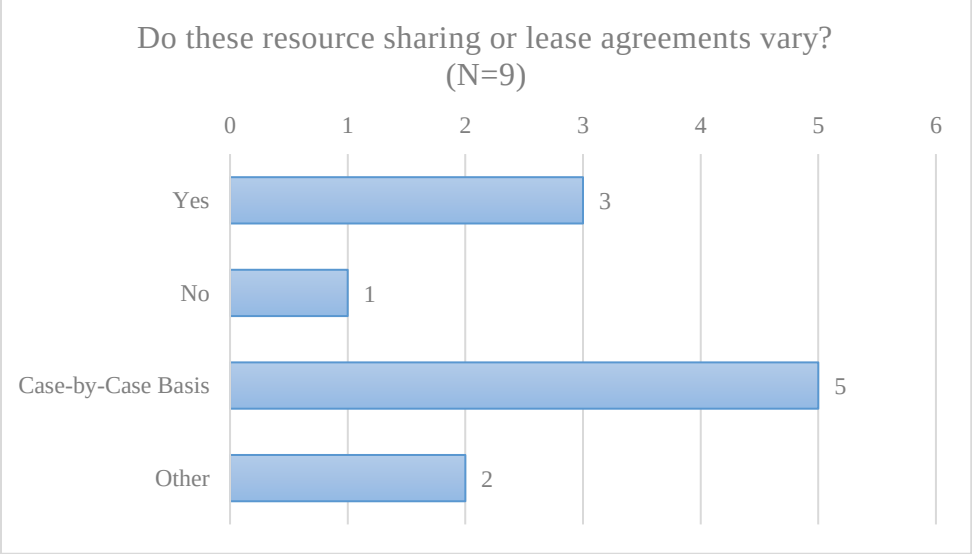


Figure B.22 State DOT Policy Variation for Resource Sharing or Leasing

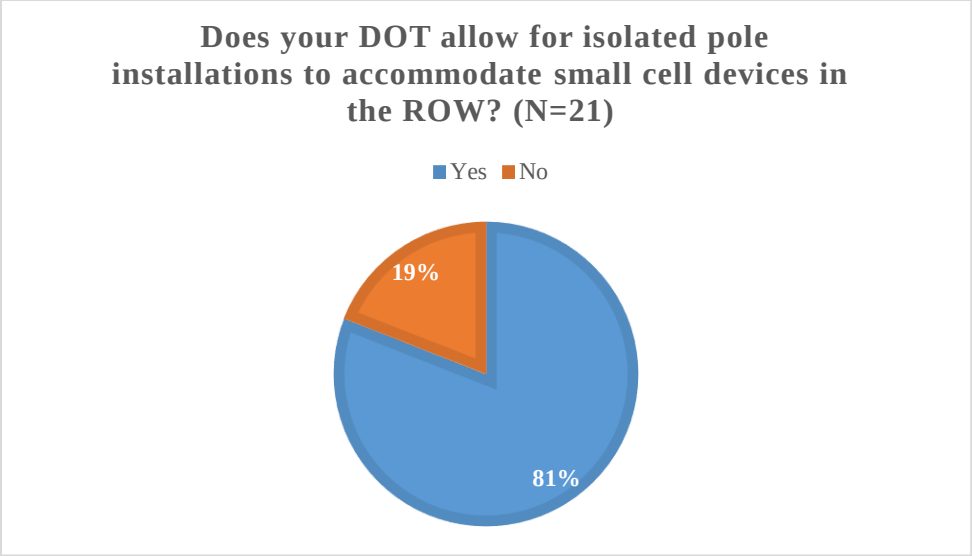


Figure B.23 State DOTs Allowing Isolated Poles for Small Cell Devices

Another development of note for this research is the recent and rapid expansion of Dig Once legislation. As defined by the FHWA (2013), Dig Once is "requirements to reduce the number and scale of repeated excavations for the installation and maintenance of broadband facilities in rights-of-way." While national legislation for this requirement did not pass in 2018, 11 states currently have some form of Dig Once law. These laws come in a variety of formations, but some require DOTs to install conduits for fiber optic lines during construction projects. The conduits can later be used through permitted fees or even rental, depending on the state. The most mature Dig Once law is in Utah, which was enacted in 1999 to assist in broadband deployment prior to the 2002 Olympics. These laws vary, and legislation is under review for some DOTs. Depending on the requirements, DOTs could be required to not only install these conduits but also implement a system and process for tracking, mapping, and updating installations. Even a fee-neutral approach to such a system could amount to substantial costs. The survey respondents were asked if they had Dig-Once legislation and whether a national law for Dig-Once might affect their current fees if enacted. The responses are presented in Figure B.24 and Figure B.25.

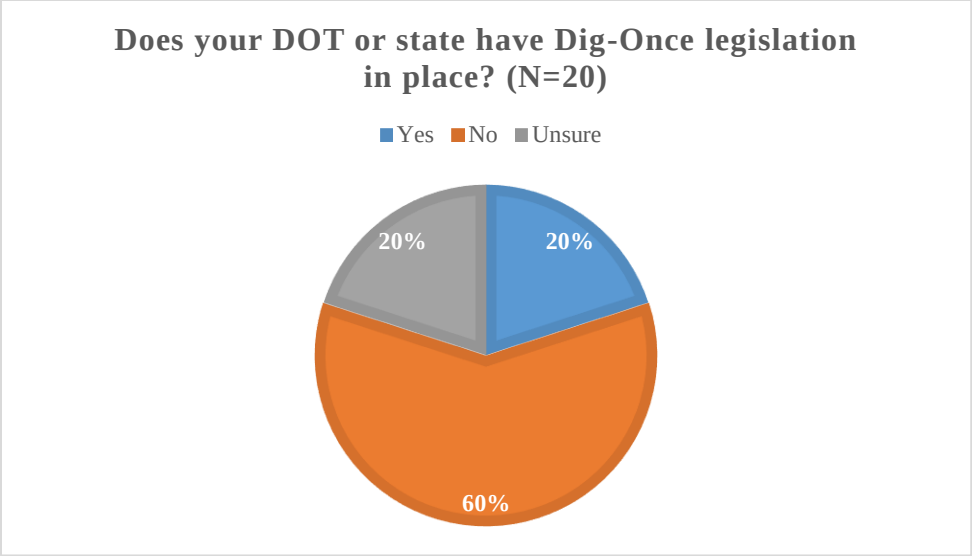


Figure B.24 State DOTs with Dig-Once Legislation

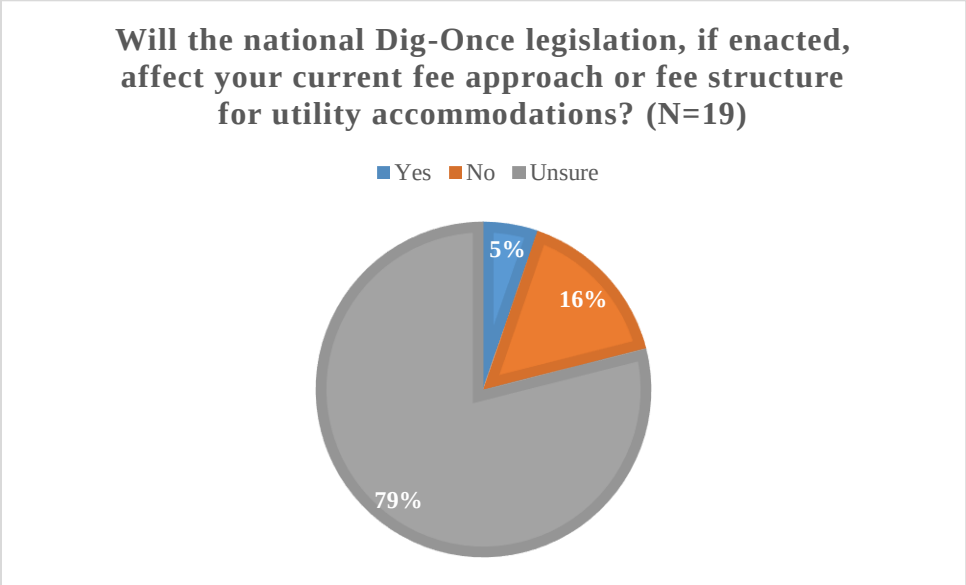


Figure B.25 State DOTs Impacted by a Potential Dig-Once National Law

The survey respondents were also asked about their plans and legislative authority regarding the implementation of fee structures for utility accommodations. First, respondents were asked if their DOT had legislative authority to impose fees for utility accommodations. As presented in Figure B.26, 40% of the respondents (N=20) have such authority, while 30% noted they do not.

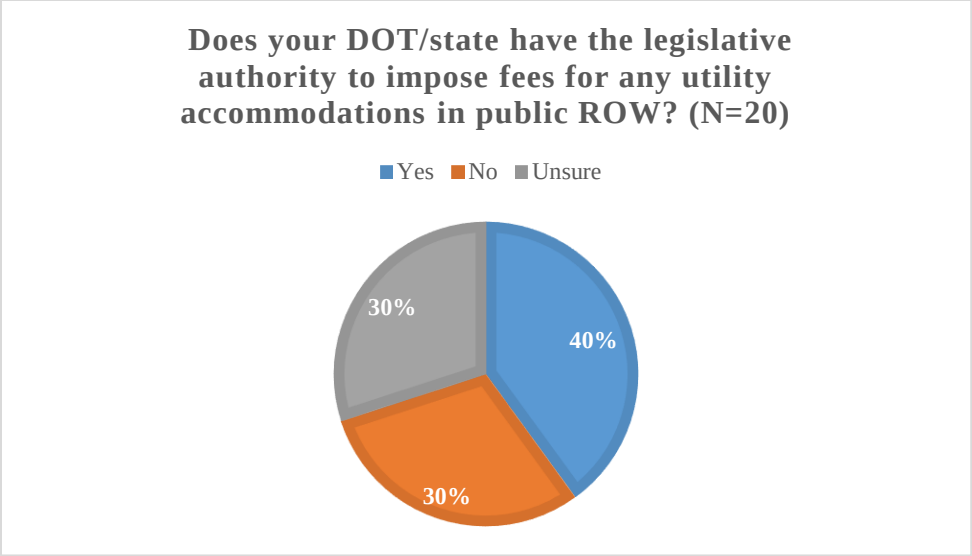


Figure B.26 State DOTs with Legislative Authority to Charge for Accommodations

The respondents were then asked about their plans to implement a fee structure or policy regarding the implementation of fees for accommodating utility or telecommunication facilities within DOT ROW. The responses are presented in Figure B.27 and Figure B.28. Most of the respondents (69%, N=19) do not plan to implement fees nor (58%, N=19) prepare a policy for such a practice.

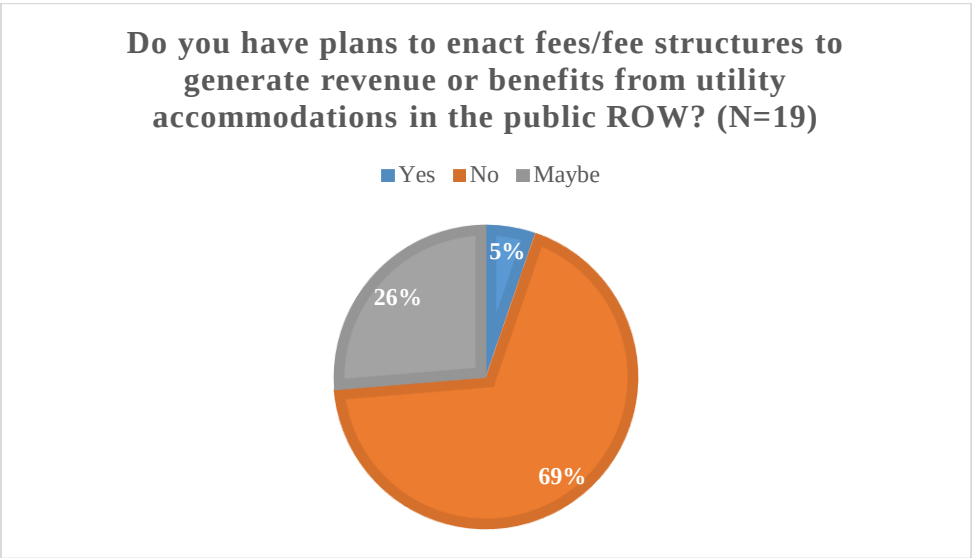


Figure B.27 State DOTs Planning to Implement Utility Accommodation Fee Structures

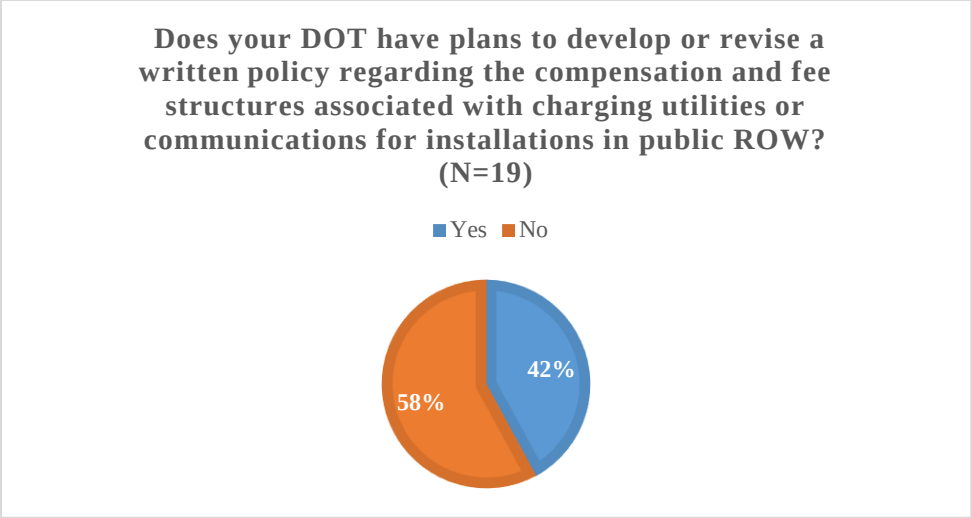


Figure B.28 State DOTs Planning to Develop or Revise a Policy for a Utility Accommodation Fee Structure

The respondents were also asked which state DOTs already had a policy for compensation associated with charging utilities or telecommunications for installations in public ROW. The response is presented in Figure B.29. Most of the respondents (58%, N=19) do not have such a policy in place. Summarizing these responses indicates that many state DOTs have, or believe they have the legislative authority to charge utilities and telecommunications for accommodation of their facilities in the state DOT ROW. However, most of these state DOTs do not charge these fees, do not plan to charge these fees, and also do not have policies nor plan to develop policies for this practice.

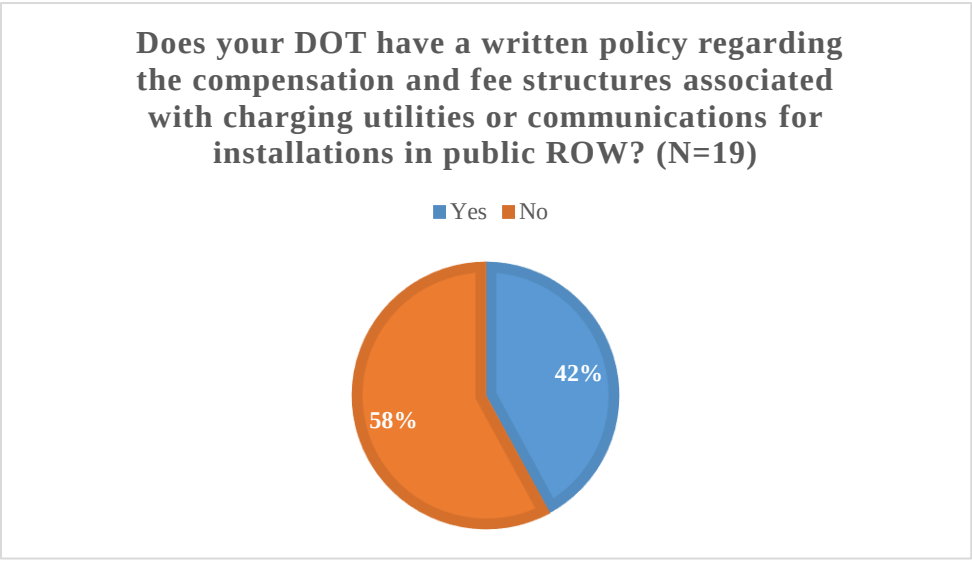


Figure B.29 State DOTs with Utility Accommodation Fee Policies

For the state DOTs without this practice or plans to adopt this practice, it may be worthwhile to note the perceptions for state DOTs who do currently have accommodation fee structures. The respondents who

noted that they charge utilities and telecommunication fees for accommodation in the public ROW were asked for their rating of the usefulness and satisfaction in achieving the desired benefits from their fees. These responses are presented in Figure B.30 and Figure B.31. The results indicate that most (87%, N=8) find charging fees for utility accommodations to be useful and many (37%, N=8) are at least somewhat satisfied with the benefits they attain by charging these fees. It is also noteworthy that no respondent was dissatisfied with the benefits attained from charging fees for utility accommodations.

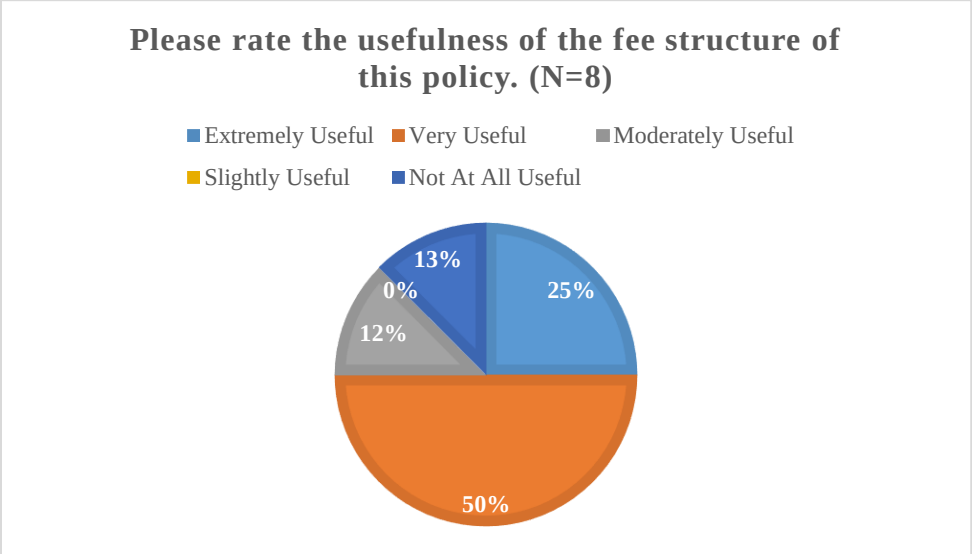


Figure B.30 Usefulness of Fees for Utility Accommodations

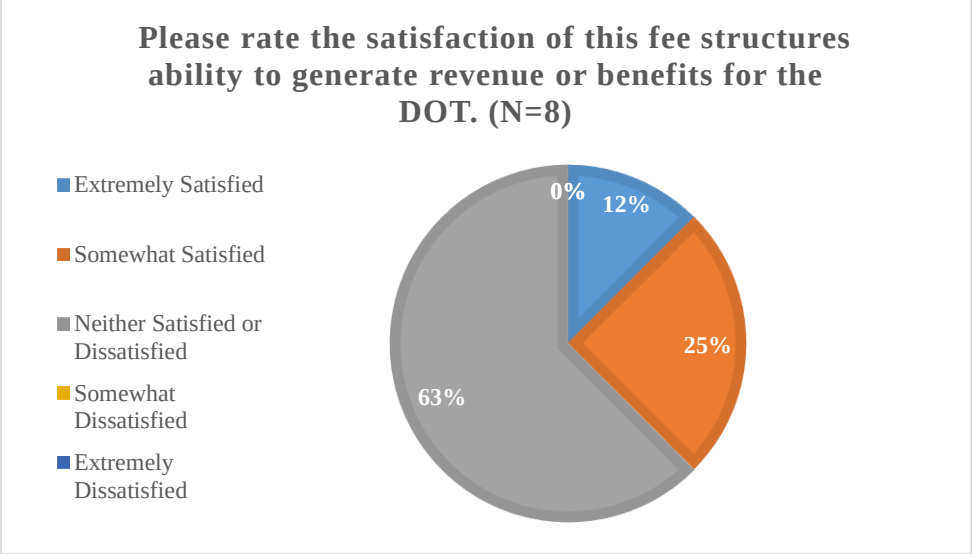


Figure B.31 Satisfaction with the Benefits of Charging Fees for Utility Accommodations

The survey results present several interesting findings, not the least of which is that the population of state DOTs implementing fee structures for utility and telecommunications may be small. This indication is further supported by the legislation and policy review previously presented. Another response from

the survey indicated that four respondents had case studies or historical data to support the determination and collection of fees for utility accommodations. The state DOTs indicating the availability of this information included Maryland, Pennsylvania, Washington, and Wisconsin. These states also indicated a willingness to participate in case study interviews. Using the survey responses, literature, legislation, and policy reviews, the research team developed a categorization approach and identified states for interviews.

APPENDIX C

Case Study Interviews

Colorado Department of Transportation Case Study

Upon recommendation of the research team, the project advisory panel selected the Colorado Department of Transportation (CDOT) for a case study due to their unique fee structure and valuation approach. The CDOT interview included representatives from Intelligent Transportation Systems (ITS), Utility Management, Permitting and Operations. The research team provided CDOT representatives with the research objectives and interview questions in advance of the interview. CDOT advised that multiple offices and an assortment of policies and legislation are involved in accommodation of utilities, including broadband and fiber optic telecoms, small-cell and macro-cell facilities. Accordingly, they arranged for representatives knowledgeable about these topics to participate in the interview to communicate a complete understanding of CDOT's approach.

Colorado's fees for utility accommodation follow various federal and state laws depending on the type of utility, whether the installation crosses or is installed longitudinally within highway ROW. CDOT does not charge a fee for a standard accommodation permit.

CDOT has a long history of receiving compensation for accommodation of utilities, specifically for telecoms/data facilities longitudinally installed within state highway rights-of-way (ROW). In 1997 Colorado enacted a law allowing telecom companies longitudinal access to all state highway rights-of-way (ROW) in exchange for compensation. Longitudinal access is revenue generating through a lease agreement or Public Private Partnership (P3) agreement and only applies to broadband/telecoms, macro cell and small cell/5G utilities. When companies voluntarily enter a P3, CDOT can use its assets to negotiate the P3 agreement – swapping, bartering or financially.

CDOT follows FCC fee-structure guidance for small-cell/5G installations. Private utilities and macro-cell towers are property management leases unless tied to a P3. CDOT also has legislation allowing the department to require joint trench use or shared conduits. The interview included discussions about general utility permitting, broadband and fiber optic lines along state highway ROW, and small and macro cellular structures.

General Utility Permit Fee

The CDOT interview covered general utility permits and fees. This area of permitting operates in a non-revenue generating capacity; fees are not collected. Private utilities desiring a permit to enter CDOT ROW must enter into a lease agreement.

Telecoms Longitudinal Fees

Colorado's law allows telecom facilities longitudinal access in exchange for compensation. The compensation approach applies to all state highway ROW. Utilities can provide compensation through a lease based on fair value of the occupied land.

For telecoms who want to compensate fair land value, CDOT is considering a method and approach for determining and implementing an annual lease rate outlined in an Arizona DOT white paper. CDOT will be vetting this approach with an industry work group, evaluating the methodology of determining a cost to use CDOT ROW.

While CDOT owns 87% of its ROW in fee title, the remainder is easements across federal lands (e.g., Forest Service, Bureau of Land Management, tribal lands). CDOT will be exploring a method to determine value where CDOT does not own ROW in fee title. They are looking at an approach that NM DOT and AZ DOT pioneered. This approach looks at the value of the highway as an asset with pavement, shoulders, safe passage, and guardrails. DOTs create the highway asset and maintain it as a convenient and safe environment for fiber to be placed and accessed. Without the highway, a telecom would have to navigate geophysical barriers, cut down trees, create and maintain access roads, etc.

Telecoms have not been successful in acquiring longitudinal access for long sections of ROW due to the typical high costs based solely on fair value of the ROW. Almost all telecoms have abandoned the approach of compensating solely on ROW valuation as a basis for fee. Lease P3 agreements have proven to be more effective. There are 77 P3 lease agreements currently in place.

If a company wants to partner with CDOT, lease fees may be waived as determined in a P3 agreement. CDOT can use its assets to negotiate a P3 agreement – swapping, bartering, and financial. CDOT's Fiber Management Team (comprised of Regional Leadership + ITS Team leadership) reviews each proposed agreement to make sure it meets state criteria (not spending more than $50,000 in state funds and ensuring fair value is offered. This approach is unique to CDOT highway operations. The fair value question comes up a lot. CDOT does not prescribe fair value criteria. Leaving an un-prescribed fair value allows the utility to assess their ability to add assets to the deal where they have better buying power and the assets have more value to the DOT. For example, the telecommunication company's cost for adding an extra conduit and fiber while doing their work is much lower than what it would cost the DOT to go and install it themselves. The DOT estimates the value of asset offered by the telecom, at DOT's cost to hire a contractor to install the conduit and fiber. Another example is the value of lit fiber provided by the telecom would be equivalent to what the DOT would pay to lease lit fiber. The telecom can provide the services at a lower cost than DOT could acquire the same services.

From the telecom's point of view, there can be value in working with one property owner, avoiding private land leases and simpler construction along a highway with contiguous access. CDOT also considers indirect value of fiber used for highway operations – such as reduced crashes, reduced emergency response time, operational value, improved commerce, etc.

CDOT does not grant any property rights in lease agreements including P3s. A typical P3 has an up-front payment and annual lease payments for twenty years. Lease fees for dark fiber increase 3% annually.

CDOT has two people working full-time on longitudinal telecoms leases and P3s. As a result of FHWA's recent rules on the Broadband Mobile Now Act, three new positions have been established. The positions are Fiber Development Manager, Coordinator for P3 and projects, and GIS. CDOT intends to publish GIS maps showing all telecoms in CDOT ROW, following Utah DOT's model.

Cellular Device Permits/Fees

CDOT sets small cell fees based on FCC's fee structure guidance. There are no other fees. Macro cells are normally property management leases, unless tied to a P3.

Grass Roots Coalition of State DOTs

CDOT is a member of an ad hoc coalition which began with the Four-Corner states of Utah, Colorado, Arizona and New Mexico. Idaho subsequently joined. Oklahoma and Nevada are joining for the next annual meeting. Coalition states meet to share experiences and best practices and align their processes, so the telecoms industry has more consistent expectations working across cross state lines.

Alternative Uses of Highway ROW

CDOT is exploring whether to allow solar in the ROW. There are concerns about creating exclusive use with solar installations. Once land is occupied no other company can occupy the space. CDOT believes EV installations could be synergistic with highway operations but has questions about policies which might treat electric vehicle charging installations different from solar or other utility activities. There are policy reservations about alternative uses of the ROW rooted in historical federal prohibitions against profit making activities on the ROW. CDOT is hesitant to move forward without a solid legal basis.

Lessons Learned

How did Colorado successfully retain their legal framework for longitudinal compensation since inception in 1997?

Major telecommunication companies are very satisfied with CDOT's program and are not pushing for changes to the law. One reason may be that telecoms can accelerate their business development. CDOT's program provides them the ability to install new or expanded services over long distances that otherwise wouldn't be feasible due to having to deal with hundreds of property owners, multiple government regulations, lack of access, geophysical constraints and higher costs.

Colorado is a home-rule state, meaning that local governments can decide whether to adopt state statutes. The state has to maintain a healthy relationship with local governments in order to advance policy initiatives. This results in a relationship where the Legislature and the Governor's administration have a mindset to listen and not anger the local leaders. Local community leaders seen huge benefits from CDOT's program, especially in remote areas. Fiber optic services are fast becoming commerce corridors, where communities need access to grow economically, educate their citizens, and enhance their access to medical care.

The executive branch of government office supports CDOT's compensation program because 1) the state is a partner in accelerating fiber-related services to under-served populations, 2) CDOT is able to expand its ITS capabilities improving highway operations and safety for the traveling public, and 3) it enables industry to deliver their products in a competitive environment – lowering price and increasing accessibility.

When parties have occasionally proposed legislation that would water down or remove the compensation law, the political movers have consistently worked to kill the proposals in committee. CDOT indicated that their staff liaison between the DOT and the legislature has also been very instrumental in keeping the program intact.

When the highway has to be widened or other appurtenances installed and the telecom has to be relocated, who pays is dependent on the lease agreement language – usually CDOT pays.

When P3s expire how does a DOT re-evaluate a new agreement?

CDOT requires longitudinal installations to be placed at the edge of the ROW to avoid conflicts with highway widening and maintenance work. Interestingly, the telecoms still get fiber cuts on the ROW line in addition to cuts from delineator posts, guardrail and signs posts. CDOT is considering allowing micro-trenching in the paved shoulder where it would be more protected, although there is concern about locate companies working on the paved shoulder close to traffic.

CDOT is developing a system for managing and tracking workflow – processing, approvals, invoicing. DOTs don't know how to invoice companies or handle annual recurring invoices for a 20-year period. It may be challenging to determine the value of dark fiber lease rates.

CDOT would like to keep lease rates at or above industry rates. The broad appeal and value of CDOT's telecom compensation program beyond transportation purposes can induce political pressure to keep lease rates below industry prices. This can be challenging for DOTs where transportation dollars are restricted to transportation purposes, not to be used for other initiatives. Scope creep can occur.

CDOT Interview Conclusions

CDOT has a very mature and valuable program in place to receive compensation for longitudinal accommodation of telecom/data utilities. The primary reason for success is the environment achieved when fair value is defined from a perspective that benefits all parties. P3 agreements. A major reason for success is having full-time people managing the program. CDOT's program seems to be efficient and mutually beneficial and recently obtained funding for three new full-time positions.

Georgia Department of Transportation Case Study

Upon recommendation of the research team, the project advisory panel selected the Georgia Department of Transportation (GDOT) for a case study due to its unique approach to collecting fees for utility accommodation in state rights-of-way. The interview included representatives from GDOT's State Utilities Administration and the Utility Permits Manager. Of note, the former State Utilities Administrator, who completed the project survey in 2021, also participated in the interview.

General Utility Permit Fee

Permits are required for all utility installations and relocations but not for routine maintenance. Access fees (in place since 1985) are applied to all utility types on state highways. GDOT does not issue permits for longitudinal installations in Limited/Controlled Access right-of-way unless an exception is granted, which is very rare. State law prohibits longitudinal utility access to interstates. The fee is revenue neutral and limited to DOT costs. GDOT uses an average of person-hours per permit to calculate fees. Recurring fees are based on GDOT costs to run the overall program. The legal framework for collecting fees is based on federal Code, "For Communications Utilities, pursuant to 47 U.S.C. § 253, states may require reasonable compensation from providers of telecommunications services for use of Public Rights-of-Way", and Georgia Rule https://rules.sos.ga.gov/gac/672-11, promulgated under authority of O.C.G.A 32-6-174.

Resulting from a court settlement many years ago, GDOT has a legally binding agreement grandfathering a utility permitting fee structure applicable exclusively to pre-existing companies, excluding municipal utilities. The fee structure requires a lump sum annual payment, adjusted annually based on the Producer Price Index (PPI) or a negotiated percentage (e.g., 4%). Annual amounts follow the required fee structure and are based on PPI, a percentage, or number of permits times GDOT costs (GA R672-11-.04).

Communications Longitudinal Fees

Long distance and trunk communications cables are revenue generating. Due to political desires to promote broadband connectivity, GDOT recently updated its rate structure rule (GA R672-11-.03). As part of the revision GDOT committed to updating the rule every five years. The current rate schedule is the same for all communication utility companies. GDOT assesses a one-time application fee (varies by size of permit size) plus a flat annual fee. Application rates are higher for long-haul than last mile rates (<1 mile). The recurring annual fee is $300. Where lines of two or more owners are installed simultaneously and in the same trench or where cables are installed on a pole line in joint use with another utility facility, rates are reduced by 25% for each owner (GA R672-11-.03)

Cellular Device Permits/Fees

Small wireless/5G utilities are categorized as wireless. GDOT's Utility Accommodation Manual (p. 1-15) defines a wireless facility as less than 28 cubic feet. Small wireless fees are revenue neutral.

GDOT permits microcell antennas on state rights-of-way. Under certain conditions, such as attaching microcell antennas to existing poles, the pole owner must first give permission and the utility company must obtain a permit from the Georgia Public Service Commission.

GDOT staff are not aware of any property lease for Macro cell towers. Surplus property leases are typically site-specific, non-utility, public-agency agreements not generating revenue.

Alternative Uses of Highway ROW

GDOT has had general discussions about EV charging and renewable energy. To date there are no specific concerns to the utility program. GDOT believes handling these alternative ROW uses as utilities may help expedite deployment.

Ideal Program:

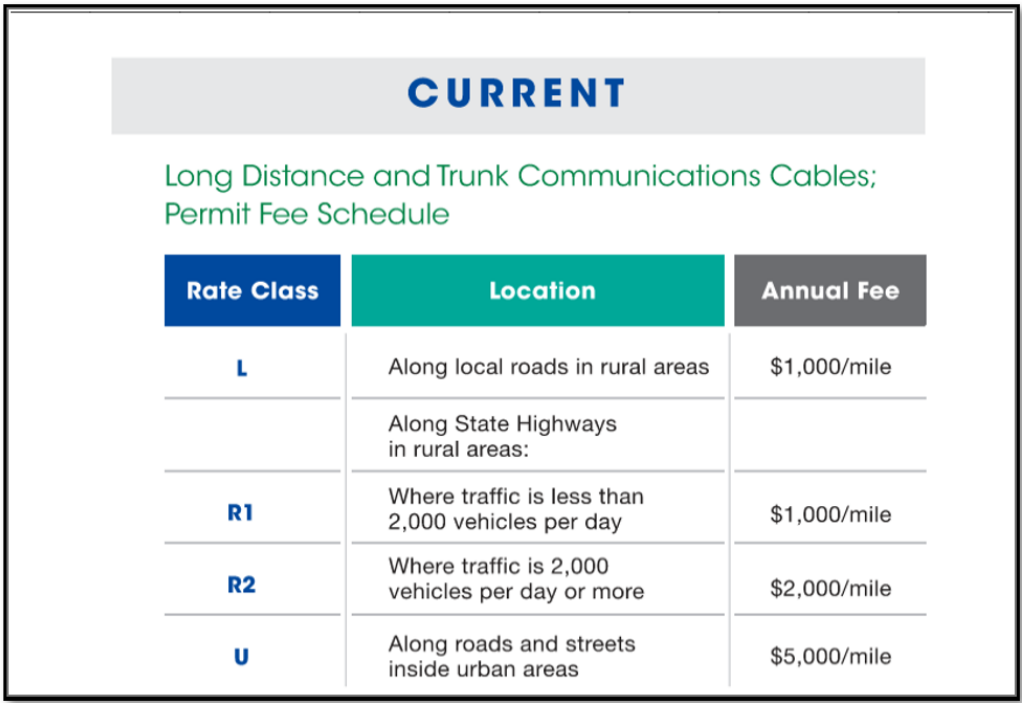
When asked what an ideal permitting program would look like, GDOT's response was "Set up policies which enable adequate operations – being able to adequately, review, assess, inspect, etc." GDOT would like to use resource sharing/bartering in the future. They would like to have compensation from interstate accommodation and tie it to operations, such as having fiber for GDOT's Traffic Management System.

Staff support the current rate structure and will reassess it as conditions change. Minimum fee structure should cover overhead. Companies are part of the conversation when considering fee structures. Part of GDOT's mission is to provide prompt service to utility companies and their contractors – prompt turnaround on permits, response during construction. It's also important for GDOT to manage these activities and protect public interests. The impacts of utilities in the ROW adds indirect costs to GDOT and public. Fees support an appropriate level of staff resources that in turn, provide needed services. Satisfying customers builds support in legislative interactions.

GDOT plans to be ready to move to GIS/3D project delivery and utility as-builts. A broadband team is being set up and will need staff/budget to operate and expand.

GDOT Interview Conclusions

Even though the rate schedule for recurring longitudinal access fees for telecoms had not been updated since 1985, the old rates were much higher than the current application fee of $1400/$742 and flat rate of $300/year. Prior GDOT annual rates ranged from $1000 to $5000 per mile, based on traffic volume (see Figure C.1).



CURRENT

Long Distance and Trunk Communications Cables; Permit Fee Schedule

Rate Class	Location	Annual Fee
L	Along local roads in rural areas	$1,000/mile
	Along State Highways in rural areas:	
R1	Where traffic is less than 2,000 vehicles per day	$1,000/mile
R2	Where traffic is 2,000 vehicles per day or more	$2,000/mile
U	Along roads and streets inside urban areas	$5,000/mile

Figure C.1 GDOT Permit Fees

GDOT's collaborative approach has shielded it from legal issues including litigation. Threats exist but are rare. Georgia's legislature recently changed its Code to provide GDOT leeway to collect revenue on interstates – paving the way for P3 projects. GDOT has a dig once philosophy but not a policy. The philosophy of using 'carrots' (e.g., 25% reduction in fees for co-locating) is working well. GDOT believes 'Simple is Better' is best for starting/maintaining a compensation program. States should avoid the temptation to be greedy and stick with costs to run a program.

Iowa Department of Transportation Case Study

Considering the unique valuation approach and fee structure of attaching utilities to Iowa DOT bridges, the research team chose to study their case study. During the interview, a representative from the Iowa DOT's Utilities Program Administration participated. A copy of the research objectives and interview questions had been sent to Iowa DOT representatives ahead of time. In this interview, we discussed permit requirements for general utility work, attachment to structures, telecommunications, longitudinal structures, small and macro cellular structures along state highway rights-of-way, and telecommunications infrastructure in general.

General Utility Permit Fee

General utility permits and fees were discussed in the Iowa DOT interview. Utility owners are required to obtain permits from the Iowa DOT if they are installing a new system, relocating it, or upgrading it. In cases where the utility owners updated or just replaced a pool without changing anything, they issued temporary permits and did not require a new permit. Alternatively, IA DOT will issue a "work on right-of-way permit" when an in-kind utility replacement is required (e.g., installing a new pole). In this area of permitting, fees are not collected; this is not a revenue-generating function. In general, Iowa DOT does not require utility accommodation fees except for those associated with interstates and bridge attachments. As stated in the IA Code, interstate accommodations are limited to telecoms (the law does not explicitly state telecoms but lists all other types of utilities that aren't covered). The Iowa Department of Transportation charges the utility companies engineering fees, attachment fees, and longitudinal occupancy fees depending on the type of work (usually a bridge attachment).

According to Title XI of the Iowa Code (which pertains to cities and other government agencies), agencies can charge utility fees. Fees must be competitively neutral and cover only the management costs; any additional fees above the initial permit fee are prohibited.

Attachment Fee

According to Iowa's DOT, there is a unique fee approach based on the weight of the attachment per foot and the length of the bridge in feet for attaching utility facilities to bridges. Bridge attachment fees were introduced by them in the early 1980s. There is a one-time fee for bridge attachments prior to installation. A utility owner will pay $100 per bridge for attaching its utility facilities to any bridge, plus $0.55 times the weight of the attachment in pounds per foot times the length of the bridge in feet, plus any engineering fees (costs related to the design and inspection due to the attachment) charged by IA DOT. After the base year of 2004, the fee increases by 3% each year. An annual longitudinal fee is collected if the bridge is located on an interstate. Fees collected from bridge attachments go to the general fund.

The Iowa DOT may attach electrical power or communication cable to an existing primary highway bridge if the attachment is in the public interest. Whenever it is not feasible to install pipelines below ground, the design of the bridge can accommodate the attachment, and the space is available, pipelines can be attached to primary highway bridges. Whenever it is deemed desirable, utility facilities belonging

to or exclusively serving a local agency may be attached to highway bridges without being assessed an attachment fee.

Telecoms / Longitudinal Fees

Under Iowa law, telecom facilities have longitudinal access to the right-of-way of freeways. The interstate accommodation provided by the IA Code is limited to telecoms (it does not specifically state telecoms but lists all other types of utilities that are excluded). Interstate longitudinal occupancy fees go into Iowa's Living Roadway Trust Fund for plantings along the interstates (Chapter 314). This is an annual fee. Living Trust Fund was established by IA in the 1990s and they came up with this method of charging for longitudinal occupancy. Fee rates were updated in 2004 and 2012 and the codified rates are increased annually by 3%. A Freeway Occupancy Fee Calculator is available on the Iowa DOT's website for determining Interstate longitudinal occupancy fees until 2030. The utility owner pays Iowa DOT an annual fee for longitudinal occupancy of the freeway right-of-way, these fees will increase by 3% after the 2004 base year. It may be possible for Iowa DOT to negotiate a fee for occupancy that is dedicated solely to the state government. According to the following, the flat fee per cable installation for 2022 will be:

- A flat fee of $24,685.28 per cable installation for a multi-duct system or $12,342.64 per mile of cable, whichever is greater.
- A flat fee of $20,429.2 per cable installation for all other installations or $4,008.16 per mile of cable, whichever is greater.

Private utilities are prohibited from installing their facilities longitudinally on the interstate, but they may be allowed to cross it without paying a fee. There are equal opportunities for all utility owners at the Iowa DOT.

By utilizing its own fiber, the Iowa DOT is not relying on private entities to share its fiber. In the case of a governmental agency installing fiber, the installation fees are waived since it is strictly for governmental purposes. Due to state law interpretations and the fees that Iowa DOT collects from these longitudinal installations, the DOT is not allowed to share fiber resources with private entities. While they do resource sharing with other governmental agencies, public agencies, and other state agencies to provide internet service. A two-way source sharing agreement is in place, in which Iowa DOT shares its fiber with other governmental agencies and vice versa. Iowa DOT mentioned that a number of fiber optic installations have been done by Iowa DOT for resource sharing with other local governments (Around 2080 agreements were signed with other governmental agencies and local governments). In accordance with state law, Iowa lows are not permitted to share fiber resources with private entities. One city wanted to put fibers in multi-system ducts and use one for public use but lease out the other two docks to other private entities, so the Iowa DOT prohibited them from doing that. As a result, they rejected fiber sharing because Iowa laws prohibit sharing resources. The Iowa DOT representative mentioned

that they had a couple of private companies seeking to enter into fiber optic resource-sharing agreements with them, but they are not sure if they were approved.

As of now, Iowa DOT does not have a written policy for Dig Once, but they plan to review their ability to comply with Dig Once Law and FHWA guidance for allowing broadband and fiber optic lines along limited access rights-of-way.

Cellular Device Permits/Fees

Under certain conditions consistent with public health and safety, the Iowa Code - Title I permits the installation of a new utility pole or wireless support structure in a public right-of-way. When an authority enters into a lease with the wireless telecommunication provider to use public lands, the authority shall offer the market rate value for that land within at least twenty years of the lease. The code stated that the total fees for a small wireless facility application should not exceed $500 for any more than five small wireless facilities, plus $50 for each additional small wireless facility. A five-year adjustment will be made to the total amount of the permit fee application. In the case of cell towers, the total fees cannot exceed $500 for eligible facilities requests or $3,000 for new tower applications. It is essential that all fees are based on actual, direct, and reasonable administrative cost. According to the Iowa DOT representative, they haven't received much interest in installing towers in rights-of-way; they just tend to go up right away. The majority of the requests they've gotten so far are from metropolitan areas.

Alternative Uses of Highway ROW

According to the Iowa Department of Transportation (IA DOT), its ROW Property Management Section is exploring how to implement federally allowed alternative uses of ROW that are appropriate for Iowa, as well as what policies, rules, and codes are needed to ensure their successful implementation.

Lessons Learned

There are various types of fees Iowa DOT charges utility companies, such as engineering fees, attachment fees, and longitudinal occupancy fees.

To update fee structures, IA DOT is considering changing statutes, rules, and policies, possibly charging a revenue-neutral permit application fee to reimburse IA DOT for the costs incurred in managing applications and as-builts and documenting the basis for calculating bridge attachment fees and interstate longitudinal access fees.

Besides Iowa State's broadband coordinator, Iowa DOT intends to establish a new broadband coordinator position in the utility section to coordinate broadband in right of way. As a result of the additional burdens of broadband accommodation on Iowa DOT, the department will need to hire more staff to permit, inspect, manage, and maintain this additional infrastructure, which can partially if not completely be addressed by allowing the accommodation to generate revenue.

Iowa DOT Interview Conclusions

A unique fee approach is followed by Iowa's Department of Transportation for attaching utility facilities to bridges depending on the weight of the attachment in pounds per foot and the length of the bridge in feet. The early 1980s was the time when they first implemented bridge attachment fees.

As part of its longitudinal accommodation's evaluation, Iowa DOT will continue to examine fee structures as well as resource sharing.

The Iowa Department of Transportation currently has no active program for receiving compensation for longitudinal accommodation of telecommunication utilities in the form of shared resources, since Iowa lows are not allowed to share fiber resources with private entities. To provide internet service to the state, they only share resources with other government agencies, public agencies, or state agencies.

Louisiana Department of Transportation and Development Case Study

Upon recommendation of the research team, the project advisory panel selected the Louisiana Department of Transportation and Development (Louisiana DOTD) for a case study due to the recognition that the Louisiana DOTD had commissioned several studies to develop fee structures. The conclusions and implementation of those studies could be of particular interest to supplement the research findings.

The research team reached out to Louisiana DOTD who noted that historically the R/W Permit fees for utilities were set to cover the administrative costs of processing permit applications and were therefore revenue neutral, and utility permit fees were assessed not on a per permit basis, but per utility. The Louisiana DOTD disclosed that there had been a complete turnover of the right of way staff in the past year and a half and was not aware of recent studies of their fee structures. The interview discussion included general utility permitting, broadband and fiber optic lines along state highway ROW, and small and macro cellular structures.

Louisiana DOTD has established permit fee schedules for receiving compensation for accommodation of utilities. Most of the fee schedules were established on or after 2012 without subsequent revision to account for inflation or population shifts.

General Utility Permit Fee

Louisiana Administrative Code allows only public utilities and municipal agencies to install utility facilities along highway right-of-way. The Louisiana DOTD does not allow utility installations to be placed on and along highway right-of-way unless the applicant is a public utility, operating under the jurisdiction of the Louisiana Public Service Commission, or is a federal, state, parish, or municipal agency.

Louisiana charges a general utility accommodation permit fee, the authority for which is found in Louisiana Revised Statutes-Title 48, Title 48 - Roads, Bridges and Ferries. The General Utility Permit fee is determined on a needs-based compensation model. Permit fees vary by utility type and the size of the population served by the public utility or agency and are capped at a maximum allowable annual fee.

Louisiana Utility Operators' Maximum Annual Fee Schedule

(Louisiana Revised Statutes-Title 48)

Operator Type	Customers	Maximum Annual Fees
Class 1	0 – 100	$20
Class 2	101 – 500	$50
Class 3	501 - 6000	$200
Class 4	more than 6000	$700
The operator of Transmission Pipelines and Natural Gas Gathering Systems		$100.00/Parish, $1,500.00/Maximum

Wireless Permit Fees

Louisiana receives a one-time, flat fee compensation, per mile for the installation of fiber-optic cable facilities within controlled-access highway rights-of-way. The fees are assessed as a one time, lump sum with an annual renewal.

The Louisiana law limits the permit for wireless telecommunication installations placed within state highway rights-of-way. The annual permit renewal fee is fixed at the same rate for a maximum period of 10 years.

Louisiana DOT - Annual Permit of Wireless Telecommunication (Title 70§1509)

Fees/Year	Wireless Telecommunication Type
$3,500	Self-Supporting Tower/Antenna
$2,000	Monopole/Antenna
$1,500	Attachment to Existing Utility/Light Poles
$3,500	Co-Location on DOTD Tower

Wireless communications towers are typically permitted in rest areas, weigh stations, maintenance units, and other large tracts of property subject to the following criteria and limitations:

- 350 ft. (maximum) self-supporting lattice type towers.
- 195 ft. (maximum) monopole tower.
- Lighted monopole tower replacement of light standard.
  Existing communication tower.

The fee also does not apply to longitudinal telecommunication facilities operating within interstate or controlled access rights-of-way.

Louisiana DOTD Bridge/Structure Attachment

The Louisiana DOTD utility permit fee only covers the use of highway right-of-way for utility facilities and driveways; it does not cover attachments to structures, leasing excess property, or joint use agreements.

The Louisiana DOTD has the authority to assess a permit fee for the attachment of communication cables only on highway structures. There is a flat fee of $5,000 per mile to fiber optic telecommunications installations placed within state-controlled access highway rights-of-way. The fees are assessed as a one-time lump sum fee with annual renewal.

Communication cables owned by private interests that do not serve a segment of the general public, are not permitted to attach to highway structures.

Louisiana Communication Cable Installation on Highway Structures

Louisiana Administrative Code - Title 70

Guarantee Deposit Schedule		
	Bridges 300 feet and less	**Bridges over 300 feet**
Per cable not over 1 inch	$500	$1,000
In excess of 1 inch diameter	$700	$1,400
Lump Sum Fee and Annual Rental Schedule		
Bridges over 300 feet long		
Computed Charges	**Minimum Charges**	
Lump Sum Fee = $1.25/feet/pound of weight	Lump Sum = $50,000	
Annual Rental = $0.15/feet/pound	Annual Rental = $5,000	
Bridges under 300 feet long		
Computed Charges	**Minimum Charges**	
Lump Sum Fee = $0.50/feet/pound of weight	Lump Sum Fee = $5,000	
Annual Rental = $0.15/feet/pound of weight	Annual Rental = $500	

Louisiana DOTD Resource Sharing

The Louisiana DOTD may waive fees in exchange for shared resources. The DOTD has the authority to waive or reduce the permit fee in exchange for fiber sharing or for its agents, those permittees who erect facilities on behalf of the Department. Agent waivers apply to those permit applicants who erect facilities, attachments or cameras for the use of the department or other state agencies or political subdivisions to conduct departmental or state work.

The statute allows the Louisiana DOTD to co-locate on wireless facility towers or to receive an equivalent value in in-kind goods and services.

Louisiana law also provides for resource sharing of state rights-of-way by a fee in some circumstances for a utility joint use agreement.

Terms and limitations include that the maximum fee cannot exceed the fair market value of the property in joint use, nor can it exceed the reasonable administrative cost of the right-of-way permit. The Louisiana DOTD chief engineer may also waive the joint use agreement fee for governmental entities, political subdivisions and state colleges and universities.

The interview confirmed that Louisiana DOTD does participate in services in-kind, resource sharing, typically involving fiber optic telecommunications infrastructure and dark fiber, conduit space.

Alternative Uses of Highway ROW

The Louisiana utility permit team was unfamiliar with the FHWA memorandum, *State DOTs Leveraging Alternative Uses of the Highway Right-of-Way Guidance* and unaware any projects or initiatives for Renewable Energy infrastructure to be accommodated as a utility as an alternative use of the ROW.

Lessons Learned

Louisiana DOTD will benefit from the results of the research effort to help educate and familiarize the relatively new leadership team on the current and future progress of utility permit compensation.

Louisiana DOTD requires longitudinal installations to be placed in the outer 5 ft. of the ROW to avoid conflicts with highway widening and maintenance work. When the highway has to be widened or other appurtenances installed, the telecom lease agreement provides for the cost of the relocation to be born solely by the utility.

The Louisiana DOTD permit system is administered as a paper-based application, review and approval system. The permit data is entered into a standalone database and managed locally at the District Level. Current analysis is underway for the procurement of an on-line electronic permit management system.

There is an indirect association of utility accommodation value with the market value of the real estate, through the Louisiana DTOD use of the Utility Joint Use agreement. The Right of Way Department provides the real estate value determined on the purchase price valuation of the right of way, to determine the fee associated with the utility use under the Utility Joint Use Agreement.

Louisiana DOTD Interview Conclusions

The Louisiana DOTD has an established, yet aging system for permitting and compensation for the accommodation of public utilities on highway right-of-way. The Louisiana DOTD is undergoing a reorganization and downsizing of the department resulting in a utility permitting leadership team that is experienced with the DOTD, yet relatively new to the challenges of administrating and managing the utility permitting program.

Utility permit fees were established in law that is over 10 years old, to be revenue neutral, but have not been updated or subjected to an economic to maintain a revenue neutral status with the

exception of a recent effort to look at small cell facilities. The Louisiana DOTD does not have the rule making authority to revise fees without legislative action.

Maryland Department of Transportation Case Study

Based on the research team's recommendations, the project advisory panel selected the Maryland Department of Transportation State Highway Administration (MDOT SHA) as a case study due to its unique fee structure and valuation approach. As part of the interview, an MDOT SHA's Utility Department representative participated. A copy of the research objectives and interview questions was sent to MDOT SHA representatives. This interview covered permit requirements for general utility works, longitudinal structures, small and macro cellular structures along state highway rights-of-way, and telecommunications infrastructure.

General Utility Permit Fee

MDOT has a requirement for all utilities accommodated within the public right-of-way to sign an acknowledgement they have reviewed the state's accommodation policy and permitting requirements. Prior to performing any utility work within the right-of-way, any authorized public utility has to obtain a utility permit from the MDOT SHA. MDOT SHA permit process includes a fee with the purpose of reimbursing the state for the costs associated with accommodating a utility. These costs are not meant to be revenue generating. There are two types of utility permits issued by MDOT SHA; one is for standard installation and significant maintenance work; the other is for emergency situations and minor (routine) maintenance work. The blanket permit allows utility owners to do their work without having to submit paperwork at the time of the emergency or for minor (routine) maintenance work. Installation of new utilities, significant maintenance, and relocations associated with projects are permitted but handled differently. According to state law, utility permits do not require fees, but they are not specifically prohibited, so they consider the approach to utility accommodations a non-revenue-generating activity.

Every year, MDOT reviews the number of permits they approve and emergency responses they respond to. On average, there are 3 to 6,000 permits issued each year and 100 emergency responses (blanket permits). As a general rule, MDOT came up with an average expense to the state to cover the cost of regular construction permits at $350 to $425 and blanket permits at about $1,500, based on how much time is required to accommodate the utility associated with the permit.

Telecoms / Longitudinal Fees

In accordance with MDOT SHA, Generally, there are two types of access-controlled facilities: fully controlled access and partially controlled access. Longitudinal installations are generally not permitted along fully controlled access roadways except for telecommunications. This allowance is in direct response to federal Broadband initiatives. These installations are subject to resource sharing by the MDOT SHA.

Initially, MDOT SHA only approached opportunities for resource sharing on interstates. With the success of the program, resource sharing opportunities are being considered for other full or limited control access roads.

Currently, Maryland Department of Transportation (MDOT) has a separate agency support department called the Department of Information Technology (DoIT) where the valuation of resource sharing is managed, while the logistics are supervised by MDOT. As a result, when MDOT gets into resource-sharing broadband Internet communication, the value of the sharing is determined by DoIT. A Resource Sharing Agreement (RSA) is a required formal agreement that contains details such as compensation terms and conditions, similar to a project agreement. Detailed procedures for requesting resource-sharing agreements are provided by DoIT. In exchange for compensation, equipment, or services, MDOT and MDOT SHA uses RSAs to allow communication providers to place their facilities on MDOT SHA property. Maryland relies on resource sharing to gain value from the telecommunication infrastructure. In addition, the MDOT may charge fees based on fair market value for the use of highway right-of-way for longitudinal communications installations. As part of the standard pricing schedule of fiber optics, DoIT uses the Across the Fence Method (ATF) to determine the valuation of the right-of-way accommodation. There was no information provided about how the ATF method is calculated by DoIT. Typically, an "Across he Fence valuation compares three similar properties to assess the value of the accommodation.

Three different government departments (DoIT, Aviation Administration, and Mass Transit Administration) meet biweekly to discuss resource-sharing agreements which helps with consistent valuations.

A telecommunications company, for example, must submit a proposal to MDOT to install fiber optics. This proposal should then be sent to RN in the secretary's office because, under the law, both organizations' secretaries must agree that the resource sharing is happening and there is money coming back. A permit should be issued after it has been valued and approved by MDOT and resubmitted to RN before they can finalize an agreement. Resource sharing values were previously set at around $100,000 with just an earmark, but this adds another step since anything over $100,000 then has to be approved by the Board of Public Works, which is composed of the governor, the controller, and the secretary-treasurer, and they must sign off on the agreement and approve it before MDOT can proceed with the logistics of issuing the permit.

In addition to receiving additional fiber to be used, MDOT generates revenue from fiber optic installations in LARWs. They receive approximately $7 million a year from this program. These funds must be distributed back to the transportation fund.

In response to Dig Once Law and FHWA guidance, Maryland added a Dig Once policy, which further encourages broadband and fiber optic lines along ROWs. A project of 70 miles, for example, would be advertised so that carriers could install it, and this also applies to county

government projects. The MDOT is in the process of figuring out how to split up construction costs when the MDOT is responsible for completing the installation under the Dig Once policy when there are multiple carriers involved.

As pointed out by the MDOT representative, Dig Once does not affect the resource sharing or valuation approach, but is still subject to resource sharing rules (COMAR Code of Maryland Regulations).

Cellular Device Permits/Fees

Currently, MDOT allows telecommunication providers to build only one kind of cell tower, which is a Monopole type. Lattice towers are not permitted on MDOT's right of way. However, as part of the Emergency Management System, the National Guard and the State Police were only allowed to use lattice towers (an average of about 300 feet) on state highways. For cell tower permits, the standard pricing schedule charged by MDOT SHA based on the type of equipment and traffic -highway determines the permit fee in the installation area according to zone level (from 1 to 4). A 5 to a 10-year term with a renewal option is included in the agreement. In contrast, the annual fees average $1,575 to $3,700, including a 3% rent escalation increase.

In terms of fees, DoIT set a flat rate for one-time and recurring charges as annual fees for small cell facilities. The agreement is for a period of five to ten years with the option of extending it for three to five years. For each antenna, there is a recurring annual fee of $270. On the other hand, the non-recurring (one-time) fee for use of a single pole or strandline that includes the first five antenna attachments is $500, plus $270 for each additional antenna when the initial application has six or more antennas. A one-time fee of $1,000 is also charged for the installation of a new pole. A telecommunication provider that provides rural broadband access to rural areas can qualify for certain exceptions in MDOT's policy regarding broadband, for example, they won't have to pay these fees if that provider offers rural broadband to rural areas.

On average, MDOT gets about $30K to $50K back per carrier for monopoles and cell towers and $1M annually for small cell facilities across the state.

Alternative Uses of Highway ROW

In MDOT's view, EV installations could create synergies across the state, however, questions remain about how alternative uses of ROW can be implemented that are appropriate for Maryland. In order to make them successful, we must identify the appropriate places, policies, rules, and codes for their implementation, as well as the appropriate places, policies, rules, and codes that are required. Despite MDOT's general discussions about electric vehicles and renewable energy, there are many specific concerns about the alternative uses of highway ROW. In order to expedite the deployment of alternative ROW uses, MDOT SHA believes EV should be treated as utilities.

Lessons Learned

Permit fees are not required for utility permits under state law, but they are not specifically prohibited, so permits in general are considered nonrevenue-generating.

Instead of charging permit fees to communication providers (public and private entities) who wish to locate their facilities in the state's-controlled access rights-of-way, MDOT SHA uses a revenue compensation program and resource sharing of infrastructures such as towers, fiber optics, microwaves, and equipment shelters.

The longitudinal installation rights-of-way access rates are currently calculated by DoIT using the Across the Fence Method (ATF), and there is no information available at MDOT about how the ATF method is calculated.

MDOT Interview Conclusions

The Maryland Department of Transportation uses a unique resource-sharing approach to accommodate telecommunication facilities within its right-of-way. While MDOT does not generate revenue from utility permits, they do generate revenue from resource sharing, which goes back into the transportation fund. MDOT generates around $7 million per year from resource sharing, around $30,000 to $50,000 on average per carrier per year for monopoles and cell towers, and $1,000,000 per year from small cells across the state.

As long as the industry continues to use RW longitudinally, MDOT plans to partner with them. A program is currently in place for MDOT to receive compensation in the form of shared resources for fiber optics, monopoles, and cell towers.

MDOT applies the Dig-Once strategy to its policy, which does not affect its approach to resource sharing or valuation.

The MDOT wants more information and discussion about electric vehicles, believing that they will have a synergistic effect across the state, but they have questions about implementing federally approved alternative uses of ROW that are appropriate for Maryland, as well as what ideal places, policies, rules, and codes are required for their successful implementation.

Ohio Department of Transportation Case Study

Upon recommendation of the research team, the project advisory panel selected the Ohio Department of Transportation (ODOT) for a case study due to their preliminary efforts to achieve a revenue generation from longitudinal placement of fiber within limited access rights of way. The ODOT interview was conducted with a member of Utility Management. The research team provided ODOT representatives with the research objectives and interview questions in advance of the interview. ODOT advised that multiple offices and an assortment of policies and legislation are involved in accommodation of utilities, including broadband and fiber optic telecoms, small-cell, and macro-cell facilities.

ODOT does not charge a fee for a standard utility accommodation permit. ODOT does have a fee structure for cell tower leases. ODOT has reviewed their ability to comply with Dig Once Law and guidance from FHWA to allow broadband and fiber optic lines along Limited Access ROW, including small and macro cellular structures. In consideration of the opportunity for resource sharing and revenue generation for this expanded accommodation, ODOT had conducted a study to assist them in the valuation of rights of way for utilities choosing to install longitudinally within LARW. KPMG conducted that study on behalf of ODOT. The report provided a basis for establishing a user fee for such accommodation.

General Utility Permit Fee

The ODOT interview covered general utility permits and fees. This area of permitting operates in a non-revenue generating capacity; fees are not collected based upon Ohio law not allowing the DOT to charge for accommodation in general Right of Way. Private utilities desiring a permit to enter ODOT ROW are generally not accommodated. Utilities have traditionally not been accommodated in Limited Access Right of Way longitudinally but are allowed to cross LARW.

Telecoms Longitudinal Fees

Under specific state statutory authority, ODOT may allow telecoms to occupy ODOT RW for a fee. At present, ODOT policy is to allow longitudinal placement of telecom facilities within non-LARW by permit and longitudinal placement in non-interstate LARW under a license wherein ODOT recovers shared resources in lieu of actual monetary compensation

ODOT is currently (mid 2022) negotiating its first longitudinal fiber installation by a telecom in LARW. ODOT will receive shared resources in the form of dark fiber along the proposed route.

From the telecom's point of view, there can be value in working with one property owner, avoiding private land leases and simpler construction along a highway with contiguous access.

ODOT also considers indirect value of fiber used for highway operations – such as reduced crashes, reduced emergency response time, operational value, improved commerce, etc.

ODOT does not grant any property rights in lease agreements except for cell towers at this time.

ODOT has a Broadband coordinator in addition to the State Utility Manager working to address the desires of the Department to move forward in resource sharing which will improve the safe operations of the highway system.

While additional Telecoms have expressed desire to use additional sections of public ROW due to the typical high costs of acquiring and preparing other ROW. The DOT has not entered into new agreements to accommodate other Telecoms in LARW at this time.

Cellular Device Permits/Fees

ODOT has had a cell tower program in place for over 20 years. There are approximately 50 macro towers in ODOT RW. ODOT has only a handful of small/micro cell towers. The fee structure for small/micro cell towers has evolved since ODOT received the first request in approximately 2015 but generates very little revenue.

Alternative Uses of Highway ROW

ODOT is exploring whether to allow solar in the ROW. This accommodation will be addressed by another department within the DOT and was not part of the interview. ODOT believes EV installations could be synergistic with highway operations but has questions about policies which might treat electric vehicle charging installations different from solar or other utility activities. There are policy reservations about alternative uses of the ROW rooted in historical federal prohibitions against profit making activities on the ROW. ODOT is hesitant to move forward without a solid legal basis. Practical questions regarding cost/benefit, utility, physical possibility, and safety are all relevant to the policy decisions herein.

Lessons Learned

ODOT leadership is partnering with the state's leadership, the Telecom industry, and others to determine a suitable approach for accommodating utilities within LARW. The department is aware of the value of allowing this accommodation to the public. ODOT understands the value in resource sharing agreements which will contribute to the safety of the traveling public through advanced ITS networks and other systems that will improve the ability to diagnose and identify needs along the interstate system. The department also understands that the additional burden of this accommodation on the department will require additional staff to permit, inspect, manage, and maintain this additional infrastructure that allowing the accommodation to be revenue generating can partially if not completely address.

ODOT Interview Conclusions

ODOT intends to continue to partner with the industry to accommodate longitudinal use of RW. The department will continue to evaluate the fee structures and resource sharing for this accommodation. At this time, ODOT has an active program to receive compensation in the form of shared resources for longitudinal accommodation of telecom/data utilities.

Pennsylvania Department of Transportation Case Study

Upon recommendation of the research team, the project advisory panel selected the Pennsylvania Department of Transportation (PennDOT) for a case study to determine if the state was attempting to achieve a revenue generation from longitudinal placement of fiber within limited access rights of way. The PennDOT interview was conducted with a member of Utility Management with participation from the Permits unit.

PennDOT has reviewed their ability to comply with Dig Once Law and guidance from FHWA to allow broadband and fiber optic lines along Limited Access ROW, including small and macro cellular structures. **At this time Pennsylvania law does not allow for longitudinal installations of any utility including Broadband. Therefore, PennDOT is not seeking any revenue generation or resource sharing from such installations.**

General Utility Permit Fee Summary

Per 67 PA Code, Chapter 459.4 PennDOT charges fees for utility installations to defray the costs incurred by the Department in reviewing and processing the application and plans, including on site reviews, and the spot inspections of these installations. The permit fee varies depending on the size of the surface opening for subsurface facilities and by the number of above ground facilities. The Department may charge additional fees for inspections if necessary and other administrative costs such as notary services or recordings of instruments in various counties. . There is an issuance fee, inspection fee, accommodation fee, and an annual rental fee that is billed to the licensee. Pennsylvania Statutes Title 36 P.S. Highways and Bridges § 670-411 states that "… Such fees shall not exceed the reasonable cost of permit issuance, inspection, and surface restoration costs. PennDOT does have a fee structure for utilities to be accommodated on bridge structures.

There are no immediate plans to adjust this fee structure.

Telecoms Longitudinal Fees

Pennsylvania's law 459.7(10) currently does address utility accommodation for crossings of LARW requiring a permit for all activities except for emergencies. PennDOT has not taken steps to allow for accommodation with resource sharing or direct compensation agreements nor are there any immediate plans to do so. There are no immediate plans communicated to the Utility department to become revenue generating for utility accommodations within public rights-of-way.

PennDOT has a Broadband coordinator as recently required by FHWA.

While additional Telecoms have expressed desire to use additional sections of public ROW due to the typical high costs of acquiring and preparing other ROW. The DOT has issued permits per

policy in DM-5 and regulation in 67 PA, Chapter 459 to accommodate Telecoms to cross limited-access ROW at this time.

Cellular Device Permits/Fees

Cell towers are usually in their own easements outside of DOT right-of-way. They would be subject to the permit fees identified in 67 PA Code Chapter 459 if occupying DOT ROW for inspections.

Alternative Uses of Highway ROW

PennDOT is currently working with The Ray to perform an analysis on the feasibility of solar within the PennDOT right-of-way. If the department chooses to pursue solar in the future, it will have to be through the P3 process since the Limited Access Highway Law of 1945 prohibits the commercialization of the ROW.

Through the National Electric Vehicle Infrastructure (NEVI) Formula Program, PennDOT will be provided $171 million in funding over next 5 years to build out electric vehicle charging infrastructure. Initially these funds will be allowed to the designed Alternative Fuel Corridors to deploy DC Fast Chargers every 50 miles.

With regards to Broadband, PennDOT's support is limited by the Limited Access Highway Law of 1945 and there are federal limitations too.

PennDOT Interview Conclusions

PennDOT is unable to partner with the industry to accommodate longitudinal use of interstate and freeway rights of way based on Pennsylvania law. There is no immediate discussion for developing a fee structure for revenue generation or resource sharing.

Utah Department of Transportation Pilot Case Study

These approaches were organized in a meaningful and useful way state DOTs can adapt existing objective-based approaches. This is true for identifying valuation of right-of-way methods and how states should consider setting fees based on their goals.

These fee guidelines include approaches to compare fees, leasing, and in-kind trading used by other DOTs, guidance for setting fees through analyzing fee structures used by other DOTs, and standardizing and normalizing these fees (with explanation for the variation among the fees, valuation methods, and other factors). The decision-support framework includes information to consider when developing a fee or leasing schedule for occupancy for telecommunications facilities and to the extent feasible, general utilities.

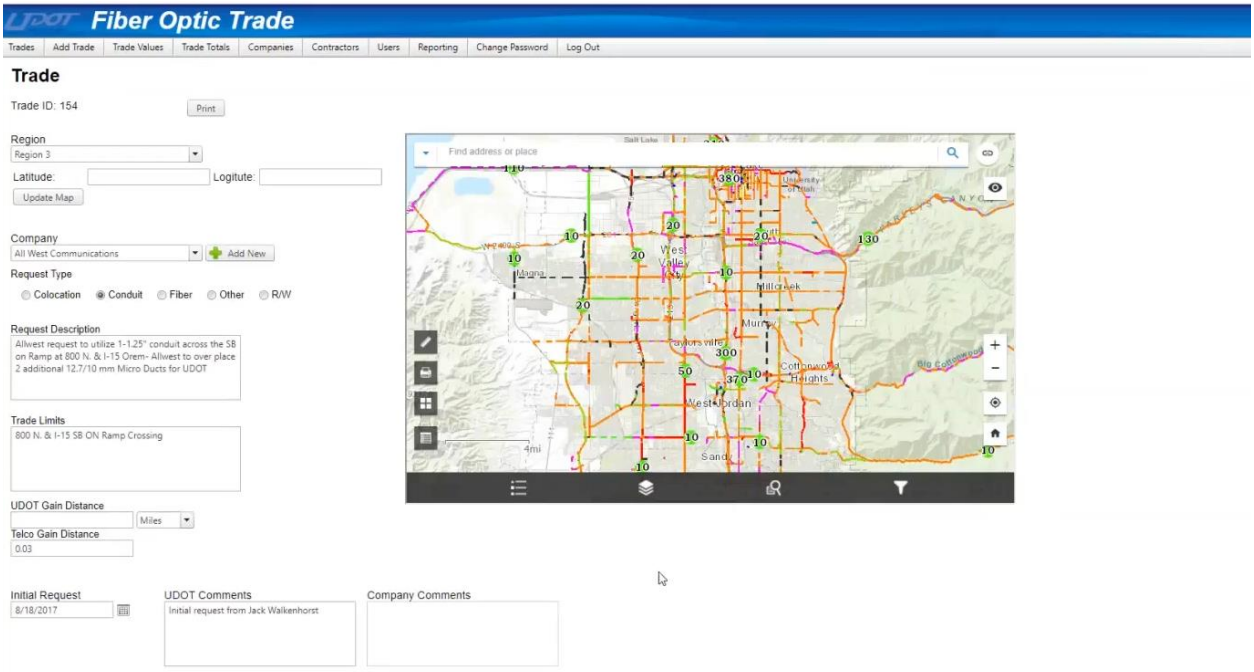


Figure C.2 UDOT Fiber Optic Trade website

Company	UDOT Distance	Telco Distance	CompanyValue	DepartmentValue	Net Value	Total Combined Value
	154.76	93.45	$5,406,468.67	$897,852.60	($4,508,616.07)	$6,304,321.27
	1.00	0	$850,000.00	$850,000.00	$0.00	$1,700,000.00
	57.00	40.00	$6,935,331.00	$6,921,704.00	($13,627.00)	$13,857,035.00
	4.53	16.60	$37,456.00	$824,513.00	$787,057.00	$861,969.00
	19.43	50.84	$3,176,561.60	$5,802,093.92	$2,625,532.32	$8,978,655.52
	214.75	111.78	$18,067,022.80	$4,360,839.02	($13,706,183.78)	$22,427,861.82
	57.00	47.00	$3,084,140.11	$3,084,140.11	$0.00	$6,168,280.22
	61.60	62.30	$9,873.60	$64,497.84	$54,624.24	$74,371.44
	26.41	21.28	$3,806,300.00	$1,974,744.08	($1,831,555.92)	$5,781,044.08
	33.00	3.50	$0.00	$37,382.40	$37,382.40	$37,382.40
	303.56	285.49	$20,135,197.84	$28,111,819.56	$7,976,621.72	$48,247,017.40
	4.91	34.47	$928,140.52	$2,608,294.11	$1,680,153.59	$3,536,434.63
	68.22	184.33	$12,628,869.42	$12,628,869.42	$0.00	$25,257,738.84
	0	20.23	$0.0	$0.0		
	13.53	39.50	$2,035,142.00	$1,700,000.00	($335,142.00)	$3,735,142.00
	0.03	21.37	$8,385.34	$1,598,437.44	$1,590,052.10	$1,606,822.78
	2875.77	0	$5,254,603.60	$192,443.06	($5,062,160.54)	$5,447,046.66
	0.02	0	$11,697,664.00	$15,461,558.34	$3,763,894.34	$27,159,222.34
	1040.76	212.95	$8,872,094.24	$13,069,451.66	$4,197,357.42	$21,941,545.90
	81.29	0	$370,106.88	$2,670,307.12	$2,300,200.24	$3,040,414.00
	3.10	10.00	$695,312.64	$747,648.00	$52,335.36	$1,442,960.64
	2.09	2.03	$942,036.48	$149,529.60	($792,506.88)	$1,091,566.08

Figure C.3 UDOT Fiber Optic Trade Tracking

Renewable Energy & Alternative Fuel Fees

UDOT is investigating a few areas to consider for going beyond a revenue neutral approach. For instance, with electric vehicles, UDOT is looking at public-private partnerships that would involve allowing a third-party into the ROW for sale or vending of electricity in exchange for a share of the revenue stream. This is a developing area, and nothing is currently in place.

Cellular Device Permits/Fees

UDOT has a separate program regarding cellular devices as they are treated differently than longitudinal fiber installations. Connection to fiber, if part of tower installation, could be trade value associated with fiber connectivity or by encroachment permit. For large towers, they are treated as a regular lease. UDOT has not had requests for installation of larger towers within ROW except for on surplus property or in instances of acquiring ROW with towers already in place. The lease is determined based on market value for lease of the property for cellular tower use. There are variables affecting this value such as the number of carriers on the tower, the area of the tower, etc. It equates to multiple leases on the same property.

For 5G and small cellular devices, fees are set legislatively at $250 for the application of a new small cellular isolated pole and $250 annually. If it is a co-location, the application is $100 and an annual fee of $100. Applications are reviewed for safety but otherwise, UDOT approves them within given shot clocks. This is all controlled by the Utah Small Wireless Act and this is no UDOT policy. For services to the device, fiber optic and power service would be by encroachment permit, as would installation of the pole. The requirements for multiple permits controlled by various policy or law has been a point of confusion for installers. Small cellular devices can also be attached to a UDOT facility but the possible locations are outlined where that would be allowed, according to safety. To date, no devices have been placed on UDOT facilities. A unique aspect within this law is that Utah does not recognize these devices as a utility and therefore they are not reimbursable for relocations, as other utilities are in Utah.

UDOT Interview Conclusions

UDOT has a very mature and valuable program in place regarding their accommodation of fiber optic facilities. UDOT emphasized a major reason for its success with resource sharing, is having a designated person manage the program full-time. This seems to be an efficient and mutually beneficial program and was just recently able to glean state funding for additional growth. UDOT's other permitting programs also seem effective; there may be some interest in investigating their valuation of general encroachment fees.

Beyond the excellent information collected, the research team also learned to reduce the structure of the case study interviews. Though the case study questions were available, it much more productive and informative to loosely present topics and broad questions and have UDOT representative provide details. The research team plans to conduct future case study interviews with questions along the different permit areas and include guiding bullets from which the interviewees can respond.

Wisconsin Department of Transportation Case Study

In response to the research team's recommendation, the project advisory panel selected the Wisconsin Department of Transportation (WisDOT) for a case study because of its unique fee structure and valuation approach. As part of the interview, representatives from Statewide ROW Permits, Utility Permits, and WisDOT-Owned Railroad ROWs were present, as well as representatives from the Wisconsin Division of FHWA. Before the interview, the research team provided WisDOT representatives with the research objectives and interview questions. The Wisconsin Department of Transportation informed that utility accommodation is governed by several offices as well as a variety of policies and legislation. This includes longitudinal utilities, small cell networks, cellular networks, and railroad right of way. Thus, they invited representatives with knowledge of these topics to participate in the interview so that a complete understanding of WisDOT's approach could be conveyed.

General Utility Permit Fee

In Wisconsin, utility accommodation fees vary depending on what type of utility is being accommodated, whether the installation crosses or is attached to the highway right-of-way, and whether it is installed longitudinally or crosswise. There is only one form used by WisDOT to cover all types of utility permits and that enables utility owners to construct, own, operate and maintain their facilities properly. WisDOT requires utility owners to obtain a permit form (DT 15-53) if they are installing, relocating, maintaining, or upgrading their systems. Utility owners can do their maintenance without additional permits for some maintenance items that don't require much traffic control. There is no fee associated with a standard accommodation permit issued by WisDOT. The Wisconsin Department of Transportation allows private utility facilities to cross state highways without charge, and they may run longitudinally on controlled-access highways under certain conditions. However, their operation should not compromise highway safety or impede the free and safe flow of traffic. The Department of Transportation does not collect fees in this area of permitting; WisDOT is not in it to make money, so this is not a revenue-generating function.

Railroad ROW Fees

A separate permit fee schedule is set by WisDOT (Trans 29.07) for utility crossings on railroad rights-of-way other than public rights-of-way, along with a similar approach of having one permit form, such as the general permit form. Utility owners should list maintenance items on the permit, and anything else will need to be approved through a temporary access permit process. In 1985, WisDOT began designing ROW fee structures for railroads, based on essentially how much effort was put into review. The utility companies only pay a one-time standard crossing fee of $175 for each crossing (aerial or underground), and the utility company must also reimburse the railroad for any reasonable and necessary flagging expenses associated with a crossing, along with the standard crossing fee. The crossing fee is in lieu of any other fees, licenses, or charges to reimburse the railroad for the direct expenses except the flagging expense associated with a crossing. Generally, longitudinal aerial utility installations fall into two categories: aerial and underground. For underground utility facility installations, the fee depends on the

length of the installation and pre-construction inspection. The installation is between 5 and 20 miles long and the fees range from $125 to $700 depending on the installation category. In addition, the utility owner will pay $50 for every daily or follow-up inspection.

Attachment Fee

WisDOT has the authority to require fees for the longitudinal occupation of controlled-access highway ROW, which includes interstates, freeways, and expressways. There is a fee charged by the Wisconsin Department of Transportation for attaching bridges, depending on whether the bridge is interstate or non-interstate, and it can range from $10,000 to $500,000 depending on the river crossings and location (bridge value, length, and importance). All rates cover a 20-year period and also apply to private utility installations on all STHs.

Telecoms / Longitudinal Fees

In the late 1950s, the Wisconsin Department of Transportation policy maintained that interstates and other freeways were free of all utilities right away. Following the telecommunications act, WisDOT came under pressure from the telecom industry to open up its interstates and other freeways right away for longitudinal installations. Accordingly, Wisconsin's secretary at the time decided not to grant the right of way for free in order to protect that public investment and get a return on it. It was introduced by WisDOT in the early 1990s when they looked at across-the-fence values to change their accommodation policy and longitudinal ROW occupancy rates on controlled-access highways. The WisDOT issued its first permit for fiber installation in 1997 and began charging a fee right away for the installation of approximately 20 or 30 miles of fiber. In order to establish the benchmark value of longitudinal fees, WisDOT examined what other utility companies and telecommunications companies were paying. According to WisDOT, the fee structure started as a four-tier approach based on mile range values but then was shifted to two tiers for a more consistent approach. There is a value in working with a single property owner rather than multiple owners, and the AADT varies by urbanity or rurality.

Currently, Wisconsin law authorizes utilities, including telecommunications carriers, to install and occupy right-of-way on state trunk highways to install and collocate after obtaining a utility permit from the Wisconsin Department of Transportation. WisDOT has the authority to require fees for the longitudinal occupation of controlled-access highway ROW including interstates, freeways, and expressways. The Wisconsin Department of Transportation does not charge a right-of-way fee for the longitudinal occupation of non-controlled access highways. The fee structure on controlled-access highways is determined based on installation length and Annual Average Daily Traffic (AADT). The higher traffic areas capture more revenue, which is assumed to be a more desirable location. A one-time fee of $10,000 to $12,000 is charged per centerline mile of installed length over a 20-year period and in the case of installations shorter than 300 feet, the fees are prorated. Instead of charging fees, WisDOT may enter into a shared resource agreement with a wireless provider to obtain dark fiber or communication services.

Under exceptions, WisDOT allowed private utility facilities to cross state highways at no charge and may run longitudinally along controlled-access highways at a cost without impairing highway safety or interfering with traffic flow. Private utility facilities are charged longitudinally by WisDOT regardless of whether they are on controlled access or not, and the fee structure is the same as the longitudinal fee.

The governor's initiative on broadband prevents WisDOT from giving easements on its highway right of way. The legislature passed a statute that prohibits WisDOT and the Department of Natural Resources from charging any initial fees for the installation of broadband. When it comes to their interstate freeways or other controlled access situations, they would normally charge a fee, but if it were a broadband situation, they would waive that initial construction fee, and they have had to do that several times.

In the event that WisDOT needs to expand their highway and relocate the utilities, the utility owners will be responsible for relocation costs, and this policy applied to all utilities except those that are resource sharing. Accordingly, if a company shares fiber with WisDOT, then WisDOT will pay the percentage of moving costs associated with that fiber sharing for relocation as part of the permit agreement.

Other than optical fiber, WisDOT accommodates other utilities such as high voltage electric transmission lines and gas lines in their right-of-way. In early 2000, Wisconsin's legislature passed a law under the public service commission section of the statutes that defined where high voltage transmission lines should be studied. That piece of legislation opened up the interstate to electric transmission lines, and their launch terminal installation, and allowed them to be launched. After the bill passed in 2000, WisDOT changed its accommodation policy to allow high voltage transmission lines on their interstates. The Wisconsin Department of Transportation treats all utilities equally, whether they are fiber optics, electricity transmission, or a gas line, it is not a hardship for them to allow in. To treat everyone fairly, WisDOT charges longitudinal utilities the same fee as fiber optics, and WisDOT's compensation approach applies to all longitudinal utilities.

The Wisconsin Department of Transportation entered into many shared-resource agreements in lieu of cash payments and received dark fiber for the longitudinal use of controlled access highway ROWs. WisDOT established a benchmark for resource sharing of dark fiber by negotiating the deal with the fiber provider. As part of the resource sharing process, negotiations were held first, and then a benchmark was established, for example, WisDOT signed a shared resources agreement with Touch America. Initially, the agreement was just going to serve as a conduit for 40 years of sharing, and after rounds of negotiations, they made a deal to share conduits and 36 dark fibers for 40 years. In order to negotiate exchanges with Dark Fiber providers, WisDOT works closely with their Traffic Management Center. With a resource-sharing project, the Wisconsin Department of Transportation does not charge a fee but tries to negotiate a good deal that is fair and equitable to both sides, and if that deal does not get enough, they charge the utility owners a fee, but if the deal is good, they accept it along with the permit. As a result of resource sharing, WisDOT generates revenue, but it's hard to measure the value since they don't know how much the telecom provider is willing to spend.

Unlike other state agencies, WisDOT does not dedicate a separate budget to fiber infrastructure construction. In 2000, WisDOT lost the opportunity to spend the fees collected from utilities because they went to the general fund. WisDOT recently passed legislation allowing them to use this revenue and put it into a special project ID and spend it. The revenue generated from these permits they charged is what was used to build the fiber connection. In addition to collecting revenue from utility installations, that revenue can be used to further build fiber optic connections around Wisconsin by using that money as a piggybank.

DOT does not intend to make any changes to utility accommodation fees or resource-sharing legislation in the near future. According to their current policy, they have enough authority to share resources or collect fees from utility installations, unless they face challenges in another situation. Current Wisconsin legislation gives WisDOT permission to place conditions on utility permits based on their policy due to the flexibility of the legislation and those conditions are contained in the entire utility combination policy, including the fee schedule. Thus, they could include any special provisions or supplementary provisions in a permit, such as a resource-sharing agreement. According to a WisDOT representative, it is much easier to conduct business when things are spelled out in a policy rather than a statute, as long as the statute supports their basic objectives. Accordingly, WisDOT recommends enacting the authority through legislation and setting or changing it based on policy.

Cellular Device Permits/Fees

In accordance with state laws, WisDOT allowed the construction of cell towers, monopoles, macrocells, and small wireless facilities along highway ROWs and controlled-access highways after obtaining the necessary permits. As defined in Statutes & Annotations Chapter 66.0414, 86.07(2)(a) and 84.01(31), WisDOT has the authority to charge fees or receive communications services as compensation or in kind for the use of highway ROW, which includes rest areas, waysides, park-n-ride lots, and other WisDOT-controlled properties. A rate fee schedule was established by WisDOT for cellular facilities and small wireless facilities (statute 66.0414). There are two categories in the fee schedule, a description of the cellular site and a description of the highway. Cellular groups are described in the cellular site description, and access rights of way are described in the highway category. The WisDOT established the benchmark value of cell tower fees based on information gathered from other cell phone company consultants. The fee rate is determined using cross-fence values and is fixed for five years, then adjusted by 10% using the Consumer Price Index (CPI). WisDOT's main mission is not to make money from cellular devices. They adjust the rate up for the consumer price index to a certain point in time for a certain dollar level and then just keep it at that level.

In lieu of charging fees, WisDOT may enter into a shared resource agreement with a wireless provider to obtain tower space or communication services.

Alternative Uses of Highway ROW

In addition to investigating how to implement alternative uses of ROW authorized by the federal government that are appropriate for Wisconsin, WisDOT is exploring what policies, rules, and codes will ensure their successful implementation. WisDOT still has an argument about where

renewable energy and electric vehicle charging stations (EVs) should be placed, how they should be placed, and who should control them.

Lessons Learned

Due to the fact that their program is not designed to generate revenue, WisDOT describes its revenue generation category as neutral revenue. WisDOT does not give the right of way away for free, but they use fees to remain competitive with across-the-fence values. In order to provide a return on public investment and on taxpayer dollars, they are trying to keep that goal in mind.

WisDOT's mission is not to make money from cellular devices; the initial rate is adjusted up for the consumer price index to a certain point in time for a certain dollar level and then the rate is fixed.

Resource sharing generates revenue for WisDOT, but measuring its value is difficult since they don't know how much the company wants to spend.

According to WisDOT, they do not intend to change their policies regarding utility installation on ROWs and charging for the revenue generated from those installations. Keeping costs competitive and dissuading installations that aren't desirable is all they need to do. Since 1985, WisDOT has designed ROW fee structures for railroads, and no changes have been made.

Currently, WisDOT does not intend to change any legislation regarding utility accommodation fees or resource sharing. Based on what they currently have in their policy, they deem themselves to be adequately empowered to share resources or collect fees from utility installation unless they encounter challenges in other areas. In accordance with Wisconsin law, WisDOT is able to set conditions on utility permits in their policy as a result of the legislation's flexibility.

Charging stations for electric vehicles (EVs) are the next consideration in the WisDOT policy plan.

WisDOT Interview Conclusions

WisDOT has the authority to charge fees or receive communication services in exchange or in-kind compensation for the use of highway ROW

Additionally, to optical fiber, WisDOT accommodates other utilities in their right-of-way, such as high-voltage electric transmission lines and gas lines. In this case, they treat all utilities equally. Regardless of what utility they are, whether fiber optics is used, whether an electric transmission is used, or whether there is a gas line to allow in, it is an exception to the policy. It is the policy of WisDOT to charge longitudinal utilities the same as it does fiber optics to ensure everyone is treated equally. A compensation approach is applied to all longitudinal utilities, and its reasonable and competitive rates are the same for all utilities.

Wisconsin lows are allowed to share fiber resources with other entities, so the WisDOT currently has an active program for receiving compensation for longitudinal accommodation of telecommunication utilities in the form of shared resources to provide internet service to the state.

As there is no Dig-Once policy at WisDOT, longitudinal utilities can be accommodated outside of Dig-Once requirements. It is common for them to receive so many requests from utilities, and so far, they have been able to accommodate them as well. WisDOT looks at congested areas for accommodations but does not follow the dig-once approach nor has it developed a policy pertaining to it. Instead, they strive to make sure everyone has enough space to play.

APPENDIX D

State Departments of Transportation Legislation and Policy Summary

Alabama

Broadband, fiber optic, small cell, and cellular facility are not considered a utility according to ALDOT utility policy and the code of Alabama. Section 37-4-1 in title 37 of the code of Alabama defines a utility to include electric power, telephone, telegraph, cable TV, lighting, water, gas, oil, petroleum, steam, chemicals, sewage, drainage, and irrigation. The Alabama DOT Utilities Manual considers the communications lines as telephone and telegraph systems. Title 11 Section 11-50B-2 differentiates between a private provider and public provider. A public provider is a municipality or municipal instrumentality, while the private provider is anyone offering service other than a municipality or municipal instrumentality.

A permit, occupancy, and use agreement are required for any utilities in the rights-of-way (Chapter 49 Section 11-49-1) requiring upgrades, installation (new utilities), and for changes in voltage or pressure of existing utilities. There are three types of permit agreements: (1) normal permit processing, this form used for all public utility accommodations, (2) special permit agreement, this form used to request a non-public utility accommodation, when the requestor does not have to pay for the right to occupy the ROW such as private utility crossing the ROW, i.e., running a water line from a house across the road to a barn, (3) permit agreement for the accommodation of utility-type facilities on public right-of-way, this form used to request a non-public utility accommodation when the requestor must pay for the right to occupy the ROW such as private utility with a longitudinal installation, i.e., a manufacturing plant desires to run a steam line two miles along the ROW to a sister plant. (Utilities Manual, 2004). Chapter 11 mentions that the municipality or municipal instrumentality does not require approval to use the rights-of-way of all public roads. Each authority is authorized to use the public rights-of-way of the state without securing prior approval and should restore all damages at their expense (Title 11 - Chapter 49A Section 11-49A-17 and Chapter 49B Section 11-49B-16).

Utility lines may be attached to a highway structure under certain conditions. For safety reasons, ALDOT stipulates that gas and electric power lines must not be attached to bridges over highways or railroads except under extreme conditions. At the same time, they allow communications and water to be attached. There is no fee mentioned in the documents reviewed related to utilities. ALDOT requires the utility owner to obtain a permit when using the ROW, but they do not mention any permit fees to attach the utility to a DOT structure.

Under normal circumstances, ALDOT does not allow two different utilities to place their pipeline in a single encasement in the ROW. Still, they allow the joint use of a single encasement pipeline where limited right-of-way and utility relocation costs are extraordinary. A joint-use agreement between the

utility facility and ALDOT should be written when a utility has a compensable interest in the land occupied by its facilities is to be used for highway and utility purposes (ALDOT Utilities Manual, 2004).

The Broadband Using Electric Easements Accessibility Act introduced under title 37, section 37-16-4, authorized electric providers, broadband affiliates, or an unaffiliated person to own, operate, maintain, construct, install, and replace a broadband system, over, under, or across electric provider's electric easements. While section 37-16-8 requires a permit from any broadband system that encumbers the right-of-way regardless of whether the broadband system is within a currently permitted electric easement or an electric delivery system. Section 37-16-4 mentions that the electric provider engaged in providing retail nonutility support services can determine pole attachment rates and shall require the same terms and conditions of access. For pole attachments to an electric delivery system for broadband services, the provider applies for the pole attachment.

Title 11 Counties and Municipal Corporations provide a broad picture to telecommunications providers. Section 11-43-62 authorizes counties and municipalities to sell or lease franchises to telephone and telegraph companies. At the same time, Section 11-50B-3 authorizes government agencies to require fair and reasonable compensation from telecommunications providers, on a competitively neutral and nondiscriminatory basis, for the use of public ROW. There is no restriction on generating revenue from telecommunications providers to use public rights-of-way by law in Alabama. At this time, there is no clear permit fee for utilities of telecommunications facilities associated with ALDOT policy. Regarding small wireless facilities, Morton (2021) mentioned a bill (SB 76) sent to the governor on February 11th, 2021, to establish rates and fees for all permits for small wireless facilities. The bill also focuses on permitting wireless providers to be authorized to co-locate or install those small wireless facilities on existing poles or install new poles on the right-of-way.

Alaska

Alaska determines specific rules and regulations regarding utility permits, including use of land and fee amounts (Title 19, 29, 38, and 42 - Alaska Statutes and Title 3, and 17 Alaska Administrative Code). Utility permits define utility ownership, type, size, location, and other information considered necessary by the Department. The Alaska Department of Transportation and Public Facilities (DOT&PF) has the authority to permit access to highway rights-of-way and may charge a fee for a permit. This authority comes from Title 19 Sec. 19.25.010. and Sec. 35.10.210. Alaska Administrative Code title 17 authorizes DOT&PF to issue a permit to construct or install utility facilities within a department right-of-way and the permits for railroad facilities issued under 17 AAC 15.471 - 17 AAC 15.551. All utility permit applications in Alaska go through a four-step process these for steps are:

1. Application and review
2. Application approval
3. Construction authorization and utility installation
4. Inspection, certification, and surety release

The Alaska Department of Transportation and Public Facilities (DOT&PF) follows 50 CFR 29 and 50 CFR 34 to processing Transportation and Utility system ROW permits (Right-of-Way Manual 2015). There are two types of utility permits to authorize utility installations: major and minor utility permits. A major utility permit is required for new utility installations, reconstruction, or modification of existing

facilities. While minor utility permits are required for any aerial service lines, those that do not require installation of poles in the ROW and are less than 200 linear feet in length or any underground service lines located outside the roadway and less than 200 linear feet in length. The Alaska Department of Transportation and Public Facilities (DOT&PF) issues a no-cost permit to utilities for facilities installed under a line extension agreement located within their rights-of-way (Alaska DOT Right-of-Way Manual 2015).

Title 38 Sec. 38.05.850 gives the director authority to issue permits, right-of-way, or easements on state land for utility facilities under a valid lease if the utility requires the land to conduct its business and establish a reasonable rate or fee schedule to be charged for these uses. The fee charged for right-of-way may be waived if the right-of-way is for a transmission or distribution line or telephone service. While title 42 Sec. 42.20.010 restricts the establishment or permit to enter the state for any cable lines owned or operated or controlled by persons, not citizens of the United States or any foreign corporation or government.

Alaska Statutes Title 42 Sec. 42.05.251 gives utilities the right to a permit to use public streets, alleys, and other public upon payment of a reasonable permit fee, and on reasonable terms and conditions, and with reasonable exceptions the municipality requires. The fee must not exceed the actual cost to the municipality of the utility's use of the public way and administering the permit program. Utilities may recover fee costs by applying them to customers' utility bills as a surcharge.

The lease, sale, or other disposals of state land, to utilities, must be at fair market value (Title 38 Sec. 38.05.810). Alaska Administrative Code Title 17 Section 17 AAC 15.041 and Alaska DOT Utilities Manuals, (2014) present the utility fee structure seen in Table D.1. The utility owner pays a non-refundable fee for each utility installation. There are some cases where the Alaska Department of Transportation and Public Facilities (DOT&PF) does not charge fees from the utility, such as utility facilities relocated at department expense. Also, there are reciprocal agreements that exist with various government agencies agreeing to waive collection fees.

Table D.10 Alaska Utilities Fee Structure

Type of Utility	Type of Installation	Fee
Major Permit: for most installations	▪ Installations of aerial or underground distribution and transmission lines. ▪ Duct systems. ▪ Utilidors and utility tunnels, including crossings and extensions. ▪ Structure or appurtenance construction, including manholes, utility poles, pedestals, switch cabinets, transformers. ▪ A crossing or installation, including service connections, requiring boring, trenching or opening a roadway surface. ▪ Aerial service lines requiring the installation of poles in a right-of-way.	$600
Major Permit: infrastructure If >200 ft in length		$1 per foot over 200 (not to exceed $10,000)
Minor Permit: Collocations or additions to existing	▪ Aerial service lines not requiring structures within the right-of-way, including service lines from longitudinal distribution lines outside a right-of-way and service lines attached to existing poles. ▪ Installation of underground service lines	$100

Alaska encourages utility owners to enter into an agreement of joint use with each other to use the same location, trench, or conduit where right-of-way widths are at a minimum, and highway improvements reduce available corridor space for utility facilities. (Utility Manual, (2014), Alaska Administrative Code Title 17). Title 3 from Alaska Administrative Code illustrates an agreement and a method for reasonable compensation for joint use for a utility owning a pole and another utility needing to enter into an agreement for joint use.

In 2018, Alaska set guidelines for wireless providers deploying small cell infrastructure (Chamberlain, 2018). The Alaska Department of Transportation and Public Facilities (DOT&PF) charged a fee for wireless telecommunications installation to grant a right-of-way or easement based on direct cost recovery. Cost recovery fees are not land use fees. These fees refer to all direct costs such as administrative costs, materials, labor, and expenses. The wireless telecommunications owner will also be charged an annual fee reimbursing the federal government for monitoring the utility for compliance with grant terms and conditions based upon direct cost recovery, and these fees will be re-evaluated every five (5) years (Alaska DOT Right-of-Way Manual, 2015). In contrast, the lease of state land for telephone or electric transmission and distribution lines is less than the appraised value of the land if the lessee is a nonprofit cooperative (Alaska Statutes - Title 38). The lease or easement of state land for pipeline right-of-way, runs for a specified term of not greater than 30 years and is renewable for additional periods of up to 30 years each. The lease price for a right-of-way lease is an annual fair market rental of the state land included in the right-of-way based on the appraised fair market value of the land. Also, the state can charge pipeline owners reasonable additional costs for all costs incurred in processing an application and in monitoring the construction, operation, maintenance, and termination of the pipeline on the right-of-way (Alaska Statutes - Title 38).

Arizona

New installation or maintenance of utility facilities within ADOT right-of-way requires a permit from ADOT, and utility companies must repair any damage to ADOT property (Arizona DOT Guideline for Accommodating Utilities on Highway ROW, 2015). The application fees, permit fees, and charges for telecommunications facilities within ADOT right-of-way must be a competitively neutral and on a nondiscriminatory basis as well as be imposed in a timely manner and directly related to the administration costs of managing the right-of-way. A transaction privilege tax, application fee, and construction permit fee are the only fees allowed by the legislator (Arizona Revised Statutes - Title 9). Also, Title 9 mentions that in a license or franchise, a political subdivision and a telecommunications corporation might agree to in-kind services or payments for the use of the public highways. The in-kind services or payments can be providing interstate telecommunications services and should be less than, or equal to, the offset of any linear foot charge owed. Title 9 Sec § 9-593 classified a small wireless facility as a permitted use and is not subject to zoning review or approval if the small wireless facility is co-located in the right-of-way in any zone.

ARS Section §28- 7048 authorizes ADOT to lease existing right-of-way for cellular telecommunications, after competitive bidding upon terms and conditions, and the lease terminology must comply with the state law. Although Individual Site Agreements, which are attachments to a Master Lease Agreement, also must be bid for competing proposals (Arizona DOT Right of Way Procedures Manual, 2018). In 2018, bill number HB 2108 prohibited a political subdivision from requiring a telecommunications corporation to pay an annual fee for underground facilities used for a small wireless facility (Morton, 2021). In 2021, the Arizona Revised Statutes - Title 9 Sec §9-592 and Sec 9-593 authorized ADOT to

charge fees to wireless telecommunication providers for the use of a right-of-way for the construction, installation, maintenance, modification, operation, or replacement of a utility pole in the right-of-way or the co-location of a small wireless facility in the right-of-way. The fees structure of the small wireless facility is as follows:

- The total application fee is not to exceed $750;
- The total application fee is not to exceed $1,000 for the modification of existing or installing new monopoles or utility poles or for the co-location of wireless facilities; and
- The total application fee for co-location of small wireless devices is not to exceed $100 for up to five small wireless facilities, and $50 for each additional small wireless facility addressed in the application

These fees for the use of the right-of-way for installing a monopole and associated wireless facility are limited to not more than the direct and actual costs of managing the right-of-way, and that it is not in the form of a franchise or other fee based on revenue or customer counts. A political subdivision may require a telecommunications corporation to pay an annual fee for their underground facilities based on the number of linear feet of the trench in the public highway. The rate per linear foot shall not exceed the highest rate per linear foot a political subdivision in Arizona charged any licensee or franchisee on or before December 31, 1999 (Arizona Revised Statutes - Title 9).

Arkansas

Arkansas state law (Statutes 27-67-218 & 27-67-304) mentions that utility facilities may be located on state highway rights-of-way. ArDOT requires a permit for any new installation, maintenance, or related work on state highway rights-of-way. Also, ArDOT prohibits utility attachments to structures, except under some circumstances (Arkansas DOT Utility Accommodation Policy, 2010). All permits, licenses, or franchises granted by any municipality to any public utility are unlimited as to time (A.C.A. § 14-200-103). The state's political subdivisions, rural electric cooperatives, rural telephone cooperatives, private television cables, and public utilities are allowed to use any right-of-way or land (Statutes 27-67-304). Also, Arkansas DOT allows fiber-optic communications lines longitudinally on fully controlled-access highways only when a Shared Resource Agreement is used between the utility owner and the Arkansas State Highway and Transportation Department (AHTD) (Arkansas DOT Utilities Internal Policies and Procedures Manual, 2011).

Arkansas state law (Statutes 23-17-510 & 23-17-505) provides the requirements and information about the use of ROW by wireless providers, small wireless facilities, and associated poles. The wireless providers can install and maintain their facility as long as it does not interfere with the public use of the property or public safety of the right-of-way. The permit of small wireless can be renewed every ten years. The ArDOT encourages wireless providers to co-locate small cellular devices on existing pole structures before building a new pole, after submitting make-ready design drawings and work descriptions. The legislator prohibited any authority from requiring directly or indirectly wireless providers to perform services or provide goods unrelated to the permit, such as in-kind contributions to the authority, such as reserving fiber, conduit, or space on the applicant's pole for the authority. (A.C.A. § 23-17-510). Though A.C.A. § 23-17-509, mentions that the authority might reserve space on an authority pole for future public safety or transportation uses.

Cities and towns have jurisdiction to assess reasonable franchise fees and other terms and conditions of the franchise agreements. The franchise fee for a public utility such as a telephone company shall not exceed 4.25% of revenue collected by the public utility from its customers. (A.C.A. § 14-199-103 14-200-101). For periods not to exceed five (5) years, A.C.A. § 27-67-306 gives the authority to State Highway Commission to execute a lease or rental agreement covering the use of the right-of-way. Arkansas charges a one-time fee and an annual rental for attachments to highway structures and the use of rights-of-way for small wireless facilities. The application fees for a permit shall be nondiscriminatory, competitively neutral, and commercially reasonable. Table C.2 presents the fee structure for small wireless facility use of rights-of-way. (A.C.A. § 23-17-511 and A.C.A. § 23-17-515)

Table C.2 Arkansas Small Wireless Facility Fee Structure

Permit	Structure	Fee
Application fees for each small wireless facility	One Time Fee	$100
Installation, modification, or replacement of a pole together with the collocation of an associated small wireless facility in the right-of-way.	One Time Fee	$250
Compensation for the use of the right-of-way per small wireless facility	Annual Fee	$30
Compensation for collocation of small wireless facilities on each authority pole	Annual Fee	$240

The wireless provider must submit make-ready design drawings and word descriptions to support their request for co-location as part of an application to co-locate a small wireless facility on an authority pole. The fees to review the make-ready design may include the amount the authority pays a professional engineer to review the wireless provider's make-ready work plans. This fee does not include any revenue or contingency-based consultant's fees or expenses of any kind. (A.C.A. § 23-17-509). A.C.A. § 23-17-511 Title 23 mentions that the wireless provider is not required to pay compensation for micro-wireless facilities that are suspended on cables strung between existing utility poles in the right-of-way as long as the wireless provider compensates the authority through other licenses or franchises held directly, or through one of the wireless provider's affiliates, for the placement of the suspension cables in the right-of-way.

California

Every municipal corporation of the State have the right to construct utility in rights-of-way (Article XII - 7901.1.(a), and public utilities and publicly owned utilities should be fairly and adequately compensated for the use of their rights-of-way and easements for the installation of fiber optic cable (Regulation of Public Utilities 201 - 3297). Under California Public Utilities Commission authorization, utility owners can enter into joint sharing of poles through a Joint Pole Agreement (Caltrans Right-of-Way Manual, 2020). The fee of the encroachment permits depend on the type of encroachment and the number of staff hours needed to review and inspect it. The fees cannot exceed the reasonable cost of issuing the permit. In their Encroachment Permits Manual (2020), Caltrans mentioned that public corporations are exempt from encroachment permit fees, but contractors working for public corporations are not exempt from these fees. The fees are calculated according to the following:

- Review and Inspection Fee
- Hourly Rate
- Field Work Fee

- Bridge Tolls Fee
- Miscellaneous Fees

In their Telecommunications policy (2018), Caltrans mentioned that the survey permit for wireless communication should be annually ($700) and to be held on deposit and charged against any inspection needed. As shown in Table D.3, the annual base license fee is based on geographical location (prime urban, urbanized, and rural) and type of equipment (number of antennas and square footage of enclosed area). The license fee can be adjusted +3.5% each year and be the highest bid when Caltrans considers competitive bidding. At the same time, the administration fee is a one-time fee ($1,000) that covers staff costs associated with the review and approval of the preliminary and final documents and includes a six-month permitting period.

Table D.3 Annual Base License Fee schedule for Cell Tower – (Caltrans, 1997 & Caltrans, 2018)

Tower Type						**Geographical Areas**	**Site License Fees**		
Microcell		**Minicell**		**Macrocell**			**Microcell**	**Minicell**	**Macrocell**
Equipment	Area required	Equipment	Area required	Equipment	Area required				
Up to 3 antennas	< 300 Square feet	Between 4 and 8 antennas	>= 300 and <=500 Square feet	Between 9 and 16 antennas	>500 and >2,500 Square feet	Prime Urban	$15,000	$18,000	$21,000
						Urbanized	$12,000	$15,000	$16,200
						Rural	$9,900	$12,000	$12,000

For any Carrier requesting a facility with more than equipment and/or a fenced area, the fees are negotiated on an individual basis. The license fee of the collocation is based on the pricing matrix, as shown in Table D.3. The administration fee for colocations on an existing facility is $1,000. If the colocation is submitted as one proposal with the primary facility, only one administration fee for the entire review will be required.

Figure D.1 illustrates the annual base license fee matrix for wireless telecommunications facilities in California with an adjustment of 3.5% per year from 2014 to 2029.

	1-Jul-14	1-Jul-15	1-Jul-16	1-Jul-17	1-Jul-18	1-Jul-19	1-Jul-20	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29
MACROCELL																
Prime Urban (Cat 1) *	$52,776	$54,624	$56,532	$58,512	$60,564	$62,688	$64,872	$67,152	$69,504	$71,928	$74,448	$77,052	$79,752	$82,548	$85,428	$88,416
Urban (Cat 2)	$33,708	$34,884	$36,108	$37,368	$38,676	$40,032	$41,436	$42,876	$44,376	$45,936	$47,544	$49,212	$50,928	$52,716	$54,552	$56,460
Rural (Cat 3)	$21,528	$22,284	$23,064	$23,868	$24,708	$25,572	$26,472	$27,396	$28,356	$29,340	$30,372	$31,440	$32,532	$33,672	$34,848	$36,072
BMINICELL																
Prime Urban (Cat 1)	$45,276	$46,860	$48,504	$50,196	$51,948	$53,772	$55,644	$57,600	$59,616	$61,692	$63,852	$66,096	$68,400	$70,800	$73,272	$75,840
Urban (Cat 2)	$31,212	$32,304	$33,432	$34,608	$35,820	$37,068	$38,376	$39,720	$41,100	$42,540	$44,028	$45,576	$47,172	$48,816	$50,532	$52,296
Rural (Cat 3)	$21,528	$22,284	$23,064	$23,868	$24,708	$25,572	$26,472	$27,396	$28,356	$29,352	$30,372	$31,440	$32,532	$33,672	$34,848	$36,072
MICROCELL																
Prime Urban (Cat 1)	$37,716	$39,036	$40,404	$41,820	$43,284	$44,796	$46,368	$47,988	$49,668	$51,408	$53,208	$55,068	$57,000	$58,992	$61,056	$63,192
Urban (Cat 2)	$24,960	$25,836	$26,736	$27,672	$28,644	$29,652	$30,684	$31,764	$32,868	$34,020	$35,208	$36,444	$37,716	$39,036	$40,404	$41,820
Rural (Cat 3)	$18,384	$19,032	$19,704	$20,388	$21,096	$21,840	$22,596	$23,388	$24,204	$25,056	$25,932	$26,844	$27,780	$28,752	$29,760	$30,804
DAS																
Prime Urban (Cat 1)	$10,000	$10,356	$10,716	$11,088	$11,472	$11,868	$12,288	$12,720	$13,164	$13,620	$14,100	$14,592	$15,108	$15,636	$16,188	$16,752
Urban (Cat 2)	$1,000	$1,032	$1,068	$1,104	$1,140	$1,176	$1,224	$1,260	$1,308	$1,356	$1,404	$1,452	$1,500	$1,548	$1,608	$1,668
Rural (Cat 3)	$500	$516	$540	$564	$588	$612	$624	$648	$672	$696	$720	$744	$780	$804	$828	$864

* Designated urbanized areas (Population of 50,000 or more) within Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, Los Angeles, Orange, and San Diego counties pursuant to the U.S. Bureau of the Census.

Figure D.1 Wireless Telecommunications Facility - (Caltrans, 1997 & Caltrans, 2018)

Colorado

Any domestic or foreign telecommunications provider, broadband provider, and utility companies authorized to do business in Colorado have the authority to erect any telecom facilities along, or under, any public highway and must obtain a permit prior to performing any installation work (Title §38-5.5-106). Title § 43-1-225(1), C.R.S., gives the CDOT authority and primary responsibility to issue permits and collect a reasonable schedule of fees for utility accommodations on all SH ROW. In-kind compensation is not permissible (Title 38-5.5-107), and the permit fees do not exceed the costs of the administration of access permits (Title 38-5.5-107). There is no fee or charge for any installation or maintenance of micro wireless facilities that are suspended on cable operator-owned cables or lines that are strung between existing utility poles (Title 38-5.5-104.5). A joint use agreement is required where the CDOT determines it is necessary or prudent for the safe and efficient use of the SH ROW (Code of Colorado Regulations - 600 - Department of Transportation).

CDOT, in their right-of-way manual (2020), illustrates the cell tower site rental fees by each geographical location, as shown in Table D.4. The rental fees have an initial lease term of five years, and the leases are automatically renewable for three additional five-year terms for a maximum of 20 years. The rental rate will increase by 3.5% compounded annually after the first year, as mentioned in the State of California.

Table D.4 Cell Tower Site Rental for the First Year (CDOT, 2020)

Geographical Location	**Rental Fees**
Urban	$14,000
Suburban	$12,000
Rural Suburban	$8,000
Rural	$6,500

Connecticut

Any utility company needs to obtain an encroachment permit first before doing any work within the right-of-way. The CONNDOT also permits the installation of telecommunications towers within the right-of-way within the limited access highway (CONN DOT Utility Accommodation Manual, 2009). Title 16 Sec. 16-50aa allowed for tower sharing to meets public safety whenever that sharing is applicable. Title 7 Section 7-130d gives the municipalities the power to lease, rents, and charges fees for any facility in the right-of-way. The Encroachment Permit Regulations - Sec. 13b-17 and Connecticut Administrative Code - Title 13b illustrate the encroachment permit fees for the utility within the right-of-way, as shown in Table D.5. The fees range from no fee to $100 for permit applications depending on the type of work or access required.

Table D.5 Connecticut Encroachment Permit Fees

Type of Permit	Fees
Class 2 - (a) Buried longitudinal utilities equal to or over 500 feet	$100
Class 3 - (a) Buried longitudinal utilities less than 500 feet	$25
Class 3 - (d) Longitudinal utility attachment to state bridge (not including any fees required under section 13a-126c of the C.G.S.)	No Fees
Class 5 - (c) Utility pole installation or replacement including guy wires and anchors Class 5 - (d) Overhead utility repair, installations or disconnections including blanket permits for overhead utility work Class 5 - (f) Utility installations, relocations and/or adjustments Class 5 - (g) Installation of public telephones	No Fees

In 2007, CONN DOT was mentioned in their master license agreement for wireless communications Facilities; the telecommunication provider paid a $2,000 license fee per month per site. The license fee will increase by 4% each year. The telecommunication provider can sub-license the site to co-locators and enter into a sub-license agreement under CONN DOT approval. In the event that the Licensee enters into any such sub-license Agreement, the amount of the licensee fee will be increased by 50% of the co-locator fee.

Delaware

Any utility construction requires a permit construction by DelDOT before any utility work begins. DelDOT requires a Joint-use single-pole at locations where more than one utility is involved, especially at locations where the right-of-way widths approach the minimum required for safe operations or maintenance (DelDOT Utilities Manual, 2007). Title 17Del. C. §1603 gives authority to the wireless provider to construct and install small wireless facilities within the right-of-way. Also, Title XXVI 337.251 gives the DelDOT authority to lease the use of rights-of-way, areas above or below state highways to public agencies or private entities, for a term not to exceed 99 years. Delaware amended their state code to reduce barriers for wireless services providers and wireless infrastructure providers wishing to place their facility in the right-of-way. At this point, wireless services providers and wireless infrastructure providers are not considered public utilities under §102(2) of Title 26 in the State of Delaware. However, they still have the right to collocate or install wireless facilities within the right-of-way.

The wireless provider acquires one or more permits to collocate or installs a small wireless facility in the right-of-way. The legislation served to limit these permit fees that can be charged by DelDOT; however, wireless providers shall pay a permit fee according to Title17 Del. C. §1605 not exceed $100 for each small wireless facility on a permit application. In addition, the wireless provider will be responsible for the Departments actual inspection costs that go above and beyond this fee. The rates must be reasonable and nondiscriminatory and should not exceed the actual and direct cost of issuing the permit. Title 17 §1613 gives DelDOT authority to enter into an agreement and collate small wireless facilities on department poles. The annual recurring rate to collocate a small cell facility should not exceed the actual, direct, and reasonable costs and must be (1) reasonable, (2) cost-based, (3) competitively neutral, and (4) nondiscriminatory rates. Such agreements shall be for a term of 10 years with an option to renew for additional 5-year terms.

Florida

FDOT required a permit for the construction, installation, and maintenance of utilities upon the right-of-way according to FDOT Utility Accommodation Manual (UAM), 2017 and Chapter 335. There is not any fees structure for utility permits on the FDOT website. Florida prepared a new rule for permitting wireless facilities (Florida Administrative Code). However, there are limitations in requiring fees for telecommunications providers using right-of-way access because of the communications service tax imposed under chapter 202. The permit fees for telecommunication facilities vary between each municipality and county depending on their election of charging fees in 2019. All permit fees must be reasonable and commensurate with the direct and actual cost of the regulatory activity (Chapter 335.183). The FDOT can charge permit application fees according to Florida Administrative Code (40E-601) as follows:

- $300 for notice general permit application for uses proposed by utilities.
- $625 for standard permit application used by utilities.
- $50 for Standard permit modification application requests for transfer of right-of-way Occupancy.

Chapter 337 gives the FDOT authority to lease the use of rights-of-way areas above or below state highways to public agencies or private entities for a term not to exceed 99 years. This chapter addresses the charging fees for communications facilities in the municipality's roads or rights-of-way, an annual amount not to exceed $500 per linear mile, and addresses each colocation fee. The rates and fees for collocations on authority utility poles must be nondiscriminatory. The permit fees may not exceed $150 per pole annually (Chapter 337.401.7).

Georgia

In Georgia, any utility company has the right to use or occupy their facility within the right-of-way, as long as the local municipal authorities approve (Title §32-4-92). A permit is required for all utilities prior to using or occupying within the right-of-way, Georgia Utilities Permitting System (GUPS) using by GDOT to perform the general encroachment permit (GDOT Utility Accommodation Policy and Standards, 2018). Any Title §36-66C-4 gives authority to any wireless provider to collocate their small wireless facilities without an agreement with authority and without an implementing ordinance. While

Title §46-5-1 restricts any municipal authority or county to Impose any occupational fee or require any telephone company to enter into an individual license and franchise agreement with such municipal authority or county. GDOT allows microcell antennas on state rights-of-way after obtaining a permit from the Georgia Public Service Commission in certain conditions, such as if microcell antennas are attached to existing poles and approved by the pole owner.

In lieu of the permitting fees, GDOT can enter into an agreement with any utility for payment of lump-sum fees to cover all department expenses on an annual basis with annual adjustments. The GDOT shall include mileage of facilities, permit work, and the estimated costs to the department of the utility's operations when calculating the blanket fees (GA Rules and Regulations r 672-11-.04). Georgia Code - Title 36 illustrates the fees permit to collocate a small wireless facility within the rights-of-way as shown in Table D.6. There are two types of fees, onetime and annual fees. The annual fees increase by 2.5% annually beginning January 2021. The permit fees of the small wireless facility must be fair, reasonable, and nondiscriminatory.

Table D.11 Georgia Small Wireless Facility Fees Schedule (Title 36 – §36-66C-5)

Type of Work	Type of Fees	Fees
Application for the collocation on an existing pole	One Time Fees	Not to exceed $100 per small wireless facility
Application for each replacement pole	One Time Fees	Not to exceed $250 per small wireless facility
Application for each new pole	One Time Fees	Not to exceed $1,000 per pole
Small wireless facility collocated on any existing or replacement pole, including an existing or replacement authority pole	Annual	$100 per year for each small wireless facility
New pole, other than a replacement pole	Annual	$200 per year for each pole
Attachment rate for collocations on authority poles	Annual	Not to exceed $40.00 per year per small wireless facility

The compilation of rules and regulations of the State of Georgia illustrates another schedule fee, GA Rules and Regulations r 672-11-.03 presents permit fees for long-distance and trunk communications cables by an annually basis according to the location of the cables as shown in Table D.7.

Table D.12 Georgia Long Distance and Trunk Communications Cables Permit Fee Schedule – (GA Rules and Regulations r 672-11-.03)

Rate Class	Location	Annual Fee
L	1. Along local roads in rural areas	$1,000/mile
	2. Along State Highways in rural areas:	
R1	a. Where ADT is less than 2,000	$1,000/mile
R2	b. Where ADT is 2,000 or more	$2,000/mile
U	3. Along roads and streets inside urban areas	$5,000/mile

The fees and rate above for a single cable installed aerially on a pole line or underground. Where lines of two or more owners are installed simultaneously and in the same trench or where cables are installed on a

pole line in joint use with another utility facility, the above rates are reduced by 25% for each owner (GA Rules and Regulations r 672-11-.03).

Hawaii

Title 19 §19-105-2 gives the utility's franchise permission to occupy the rights-of-way without interfering with the free and safe traffic flow. The Hawaii DOT (HDOT) requires a permit to install any utility facility and private lines within the state highway rights-of-way (Title§ 19-105-5). While Title§ 19-105-10 restricts permitting any utility to be installed longitudinally within the control of access lines of a freeway or need access from the through-traffic roadways or ramps. Hawaii State Legislature published a bill in 2018 relating to wireless broadband facilities. This bill established a framework for next-generation wireless broadband infrastructure within Hawaii (Chamberlain, 2018). The bill established the permitting and process for small wireless providers or communications service providers to install wireless facilities in rights-of-way (Morton, 2018) (31). The bill restricts the state or the county from requiring any in-kind compensation from the communications service provider for access to the rights-of-way to install small wireless facilities (State of Hawaii - HB2651 HD2 SD1 CD1. A Bill for an Act Relating to Wireless Broadband Facilities, 2018).

According to Title 15, there is no barrier to compensate fees from utility companies using rights-of-way. Title15-§264-7 gives the director of transportation authority to establish the fee schedule for permits. All permit fees should be recovering any costs spent on issuing the permit. The director of transportation can wave these fees if the director determines that the work will benefit the state. There would be no fee if the work were only the setting of poles to carry overhead wires (Title15-§264-7). In terms of fees, rates, and charges, Hawaii has a fee based on the number of linear feet or square yards that are occupied by the utility. Title 19- §19-102-3 illustrates these fees, the fee for a permit to trench for installations (i.e., pipelines, underground cables, and ditches) are nonrefundable fees for a minimum of $10 covers HDOT administrative costs. Then there are $0.5 per lineal foot for the first 20 linear feet of the trench and $0.10 per linear foot for the balance of the trench.

Idaho

Under Idaho state law Title 61 and Title 62, utilities and telecommunications companies are allowed to use rights-of-way to construct their facility. Utilities and telecommunications companies must obtain encroachment permits for any new utility installation and other activities within the rights-of-way. (Idaho Administrative Code - 39.03.42). The permit fee shall be responsible and based on the Department's cost to produce the permit (Idaho Administrative Code – 39.03.42).

The fees for non-utility type installations are $50 nonrefundable per permit application. For permit fees involving utility-type installations for new, modify, relocated with no prior easement rights in non-interstate, the fees are $50 for the application. While for interstate of new, modify or relocated, fees will be addressed at the time of application. There are no fees for any maintenance or emergency repair without change in location or if the ITD highway project requires modification or relocation (Idaho DOT Utility Accommodation Policy, 2003). Title 62 mentioned that the right of access to public roads granted to telephone corporations is not subject to any access fees. In addition, Idaho Administrative Code - 39.03.42 address the situation of waiving the permit fees in Idaho as following:

- Approaches resulting from right-of-way negotiations that are included in plans and completed during construction of a highway project.
- Government agencies.
- Approaches and other encroachments where direct benefit to the Department is gained.
- Utility adjustments or relocations per project utility agreement, or requested by the Department, or utility maintenance and emergency repairs.

Illinois

Illinois follows the same procedure from other states requiring a permit from the utility companies before starting any work within the Illinois right-of-way. Title 92 prohibiting any installation of utility facilities on fully access-controlled highways except as provided in the AASHTO policy. The laws and rules do not allow IDOT to charge access fees for telecommunication facilities. Chapter 35 from Illinois Compiled Statutes prohibits additional charges for any utility occupancy within rights-of-way, and they only charge an infrastructure maintenance fee subject to Section 20 so, any telecommunications retailers are only responsible for the maintenance fee rather than a variety of permit, lease, or franchise fees. For fiber optic cables Kraus & Quiroga, (2016) mentioned that IDOT charges an annual fee based on the current fair market value of an easement or leasehold for the use of interstate ROW along fully access-controlled highways. That means fees are higher in urban areas and lower in rural areas (Administrative Code Title 92 Section 530.120). Such compensation may include in-kind compensation, and all fees may be reviewed once every five years and may be adjusted by the Department based on changes in the fair market value for the use of the highway right-of-way.

IDOT also charges fees to assess the attachment of utility facilities to bridge structures, and the charges are assessed to cover the cost of the engineering administration cost. The minimum charge for any utility attachment to a highway structure will be $300. Bill number S.B. 1451, signed by the governor in 2018, this bill provides the process and procedure to prohibit or charge for the collocation of small wireless facilities deployment on to or adjacent to utility poles (Morton, 2018). 50 ILCS 840/15 illustrate the application fees (One Time Fees) for the small wireless facilities as follows:

- Application fee of up to $650 for collocate a single small wireless facility on an existing utility pole.
- Application fee up to $350 for each small wireless facility for multiple collocations.
- Application fee of $1,000 for each small wireless of a new facility.

Indiana

Indiana Code – Title 8 authorizes the communications service provider to install, collocate, or modify a wireless support structure within the rights-of-way after getting the permits for INDOT. While for routine maintenance or replacement of wireless facilities, the wireless providers do not require charging fees or obtaining an application permit. The compensation should be fair and reasonable on a competitively neutral and nondiscriminatory basis and not exceed the municipality's direct and actual costs of managing the right-of-way for the public utility. INDOT in their permit guide policy mentioned that the utility company would pay any inspection costs if necessary for work inspection. The non-refundable permit application fees are $55 for broadband and occupancy below or above ground. The Broadband Corridors

published in 2020 illustrate the access fee schedule of the broadband and wireless facilities installed in corridor roadways within the right-of-way for the fiber optic and wireless facility, as shown in Table D.8.

Table D.13 Indiana Broadband and Wireless Facilities Access Fee Schedule – (INDOT Broadband Corridors, 2020)

Broadband Service Type	Non-Recurring Administrative Fee	Recurring Broadband Access Fee	Broadband Access Permit Fee $55.00	Broadband Permit Required	Broadband Agreement Required
Longitudinal Fiber	$1,000.00	$500.00 per mile annually	Waived	Yes	Yes
Longitudinal Fiber within I-465	$1,000.00	$581.00 per mile annually	Waived	Yes	Yes
Transverse Fiber Crossing - Buried	$1,000.00	$0.00	Waived	Yes	Yes
Transverse Fiber Crossing - Aerial	$0.00	$0.00	Waived	Yes	No
Macro Cell-Urban	$1,000.00	$2,000.00 per month	Waived	Yes	Yes
Macro Cell-Rural	$1,000.00	$1,500.00 per month	Waived	Yes	Yes
Small Cell - Existing Pole Attachment	$500.00 for up to five (5) sites, $100.00 for each additional site beyond five (5)	$270.00 per attachment annually	Waived	Yes	Yes
Small Cell - New Pole	$1,000.00	$270.00 per attachment annually	Waived	Yes	Yes

Indiana Code – Title 8 addresses the application fees of the small cell facilities as well. The fees for each small cell facility cannot exceed the amount charged for a permit of a similar type or $100.

Iowa

Iowa DOT permitted utility companies, telegraph or telephone line or cable systems to construct and install their utility facilities within a public right-of-way according to Title VIII Chapter 306.46. The utility owner must obtain a permit from Iowa DOT before it places or attaches the utility facilities in the right-of-way or a primary highway structure (Administrative Code (761—115.4(306A)). The permit is not required for storm sewers and service connections within the corporate limits of a city (Iowa DOT Policy for Accommodating and Adjustment of Utilities on the Primary Road System 2012). Iowa Code – Title I

also gives the authority to install a new utility pole or wireless support structure in a public right-of-way under certain conditions consistent with public health and safety protection.

Iowa DOT charges different types from the utility companies such as engineering fee, attachment fee, and longitudinal occupancy fee according to the type of the work. Iowa Code – Title XI states that agencies can charge fees from utility owners. These fees must be imposed on a competitively neutral basis and only cover the management costs. Any other fees in addition to the original permit application are prohibited. For attachment fee, based on Iowa Administrative Code 761—115.12 (306A) and Iowa Policy (2012), the utility owner will pay $100 per bridge for attaching its utility facility to any bridge, plus $0.55 times the weight of the attachment in pounds per foot times the length of the bridge in feet. Then the fee increases by 3% per year after the base year of 2004. Regarding the engineering fee, the utility owner pays Iowa DOT any cost related to design and inspection due to the attachment. While the longitudinal occupancy fee the utility owner pays to Iowa DOT is an annual fee for longitudinal occupancy of the freeway right-of-way, these fees will increase by 3% after the base year of 2004. Iowa DOT may negotiate an annual fee for occupancy dedicated solely to state government use (Iowa DOT, 2012). The longitudinal occupancy fee is as follows:

- A flat fee of $14,500 per cable installation for a multi-duct system or $7,250 per mile of cable, whichever is greater.
- A flat fee of $12,000 per cable installation for all other installations or $2,500 per mile of cable, whichever is greater.

Iowa Code Title I – 8C addresses the authorization to install small wireless facilities and cell towers in a public right-of-way or on an authority territorial boundary. When an authority enters into a lease with the wireless telecommunication provider to use public lands, the authority shall offer the market rate value for that land with at least twenty years of the lease. For the small wireless facility, the code mentioned that the total fees should not exceed $500 for an application of no more than five small wireless facilities and an additional $50 for each additional small wireless facility. The total amount of the application permit fees will adjust every five years. For the cell tower, the total fees do not exceed $500 for eligible facilities requests or $3,000 for an application for a new tower. All fees must be based on actual, direct, and reasonable administrative costs.

Iowa Code – Title XI Chapter 480A restricts in-kind services as a condition of using the local government's public right-of-way. Also, Iowa DOT is not allowed to share fiber resources with private entities due to interpretation of state law. At the same time, they were permitted to share some fiber-optic lines with a communications company owned by the state (public-based entities), as said by Price (2016). The author mentioned that Iowa DOT entered into a source-sharing agreement for 20 years with Iowa Communications Network (ICN) to provide internet service to the state. The source sharing is two-way in that Iowa DOT shares its fiber with ICN and vice versa.

Kansas

Utility companies, including public telecommunications utilities, require obtaining permits when they need to install, relocate, remove, or maintain their utility facilities along, crossing over, or under all highway rights-of-way (Kansas DOT Utility Accommodation Policy, 2020 and Chapter 17). Chapter 17 authorized the cities and municipality to charge fees against a provider for use and occupancy of the

public right-of-way. Such fees reimburse the city and municipality for the reasonable, actual, and verifiable costs of managing the right-of-way. The charging fees can include permit fees, excavation fees, inspection fees, and repair and restoration costs. Kansas Statutes – Chapter 66-2019 mentioned that the permit fee of wireless infrastructure within public right-of-way must be directly related to costs incurred by permitting and not related to any market-based or value-based fees. The total permit fees of the wireless facility do not exceed the following:

- $500 for a collocation application that does not substantial modification, small cell facility application, or distributed antenna system application.
- $2,000 for an application for a new wireless support structure or a collocation application that requires substantial modification of a wireless support structure.

Also, Chapter 66-2019 permits any authority to enter into a lease with the telecommunication provider that needs to use public lands, buildings, and facilities at market rates with ten years lease contract in duration. While Chapter 12-1902 prohibits any city from requiring a telecommunications company to provide in-kind services. Arkansas State Highway and Transportation Department (AHTD) and Kansas DOT entered into shared resource agreements with several telecom companies, allowing fiber optic cable installation (Price, 2016).

Kentucky

Kentucky Transportation Cabinet (KYTC) requires any utility company or governmental agency to obtain an encroachment permit before undertakes any utility work within the public rights-of-way (KYTC Utilities & Rails Guidance Manual, 2019). According to the KYTC permit manual published in 2019, longitudinal and overhead installations in the ROW are prohibited on controlled-access highways. While the longitudinal, smaller, pole-mounted may be permitted under some conditions and considerations. Unfortunately, there are no formal internal DOT policy exists to figure out the permit fees. The KYTC does not require compensation for ROW use. In 2018, Tilson Technology Management, Inc. prepared a study of Analysis of State Right-of-Way (ROW) Policy and Fees to West Virginia. The researcher mentioned that KYTC does not impose ROW use fees or permit fees from utility companies, but an indemnity may be required following the encroachment permit. Chamberlain, 2018 mentioned that city of Louisville Metro in 2016 established a new permitting process for deploying a wireless infrastructure and fiber networks in public rights-of-way. The processing is to help in speed up of collocate new wireless facilities on existing utility poles. Even so, no clear policy exists regarding the permitting fees to use the rights-of-way by the telecommunication providers.

Louisiana

Louisiana Revised Statutes Title 33, 48, and 70 granted franchise to use and occupy the streets for telephone, telegraph, electric light, water, and gas system. Also, authorized wireless providers to install fiber optic, pole, and small wireless facilities in controlled access ROW. Louisiana Administrative Code Title 70-§513 allowed only public utility and municipal agency to install their utility facility along highway right-of-way. Per the statute Title §48.381.2, Louisiana receives a one-time flat fee compensation per mile for the installation of fiber-optic cable facilities within controlled-access highway rights-of-way. The maximum fee cannot exceed the fair market values of the property or the cost of

administering the permit. The statute also allows the department to co-locate on wireless facility towers or to receive an equivalent value in in-kind goods and services (Title§48.381.1). In lieu of permit fees, the Louisiana Department of Transportation and Development (DOTD) has the authority to waive or reduce the permit fee in exchange for fiber sharing or for its agents (Louisiana Revised Statutes-Title §48.381.1).

Louisiana Revised Statutes-Title 48 and Louisiana Administrative Code-Title 70 address three types of fees schedule. Title 70§1509 of the Louisiana administrative code address the permit of wireless telecommunication installations placed within state highway rights-of-way. The permit will be renewed for the same fee each year for a maximum period of 10 years. The various types of permits are listed herein:

- $3,500 annually for Self-Supporting Tower/Antenna
- $2,000 annually for Monopole/Antenna
- $1,500 annually for Attachment to Existing Utility/Light Poles
- $3,500 annually for Co-Location on DOTD Tower

The Administrative Code Title 70 and the Statutes Title 48 illustrate the utility schedule fees of the use and occupancy of highways rights-of-way. The fees are distributed by the type of operator and the population of the customers served by the utility. This fee only covers the use of highway right-of-way for utility facilities and driveways; it does not cover attachments to structures, leasing excess property, or joint use agreements. Also, these fees do not apply to longitudinal telecommunication facilities operating within interstate or controlled access rights-of-way. The fees do not exceed the maximum fees as set in Table D.9.

Table D.14 Louisiana Utility Operators' Maximum Annual Fee Schedule – (Louisiana Revised Statutes-Title 48)

Operator Type	Customers	Maximum Annual Fees
Class 1	0 – 100	$20
Class 2	101 – 500	$50
Class 3	501 - 6000	$200
Class 4	more than 6000	$700
The operator of Transmission Pipelines and Natural Gas Gathering Systems		$100.00/Parish, $1,500.00/Maximum

Administrative Code-Title 70- §1709 addresses the fees seclude of communication cable installation on highway structures. There is a flat fee of $5,000 per mile to fiber optic telecommunications installations placed within state-controlled access highway rights-of-way. The fees are distributed as one-time lump sum fees and annual rental fees; the fees are calculated according to schedules given in Table D.10 below.

Table D.15 Louisiana Communication Cable Installation on Highway Structures – (Louisiana Administrative Code - Title 70)

Guarantee Deposit Schedule		
	Bridges 300 feet and less	**Bridges over 300 feet**
Per cable not over 1 inch	$500	$1,000
In excess of 1 inch diameter	$700	$1,400
Lump Sum Fee and Annual Rental Schedule		
Bridges over 300 feet long		
Computed Charges		**Minimum Charges**
Lump Sum Fee = $1.25/feet/pound of weight		Lump Sum = $50,000
Annual Rental = $0.15/feet/pound		Annual Rental = $5,000
Bridges under 300 feet long		
Computed Charges		**Minimum Charges**
Lump Sum Fee = $0.50/feet/pound of weight		Lump Sum Fee = $5,000
Annual Rental = $0.15/feet/pound of weight		Annual Rental = $500

Maine

According to the Maine Statutes Title 35-A§2503, there are two types of permits, the right-of-way location permit, and the right-of-way excavation permit. Each has its own fee; the local excavation fees may not exceed the reasonable cost of replacing the excavated pavement. Title 35-A authorized public utilities, broadband service, and entities to construct new facilities within the limits of Highway rights-of-way after applying for and obtaining a location permit from licensing authority. In general, Maine DOT does not allow installation longitudinally within the right-of-way of a controlled-access highway, except in special circumstances. While if the installation of underground (point-to-point) in controlled-access highway, Maine DOT can enter into agreement and receive compensation for using the right-of-way. Maine DOT 2018, in their Utility Accommodation Rules, mentioned that no permit is required for replacement facilities or to install cables and wires on existing poles or conduits. The statutes title 35-A§2518 also authorized municipality for joint use and attached to poles located in a public right-of-way.

In general, currently, there are no permit fee schedules for broadband or utilities communications providers in the state highways right-of-way. Maine DOT 2018, in their Utility Accommodation Rules, addresses two types of application fees, opening permit and attachment to existing poles. The fees of these types of permits must cover the administration cost of Main DOT (Impact Value). Unfortunately, the policy does not represent any details about the amount of these fees.

Maryland

The Maryland Statutes and Utility Manual published by Maryland State Highway Administration (MDOT SHA) in 2021 authorized companies, local governments, and municipalities to use and occupy the streets for telephone, telegraph, electric light, water, and gas system. According to the Utility Manual Policy in 2021, there are two types of access control: full control access and partial control access. For the full control access rights-of-way, longitudinal utility installations are prohibited except in some conditions, but telecommunications are not. While there are no permit fees required for utility, the MDOT SHA required any authorized public utility to obtain a utility permit before starting any utility work within the right-of-way. Instead of charging permit fees, MDOT SHA uses revenue compensation and resource sharing infrastructures such as towers, fiber optic, microwave, and equipment shelters with communication providers (public and private entities) that wants to locate their facilities in the state's controlled-access rights-of-way and in some cases, SHA asked for in-kind services in lieu of compensation (Maryland Statutes - Public Utilities § 27-108). In their Resource Sharing Agreements Program Policy, the Maryland Department of Information Technology (DoIT) (2020) provides detailed procedures for the request of the resource sharing agreement, as shown in Figure D.2.

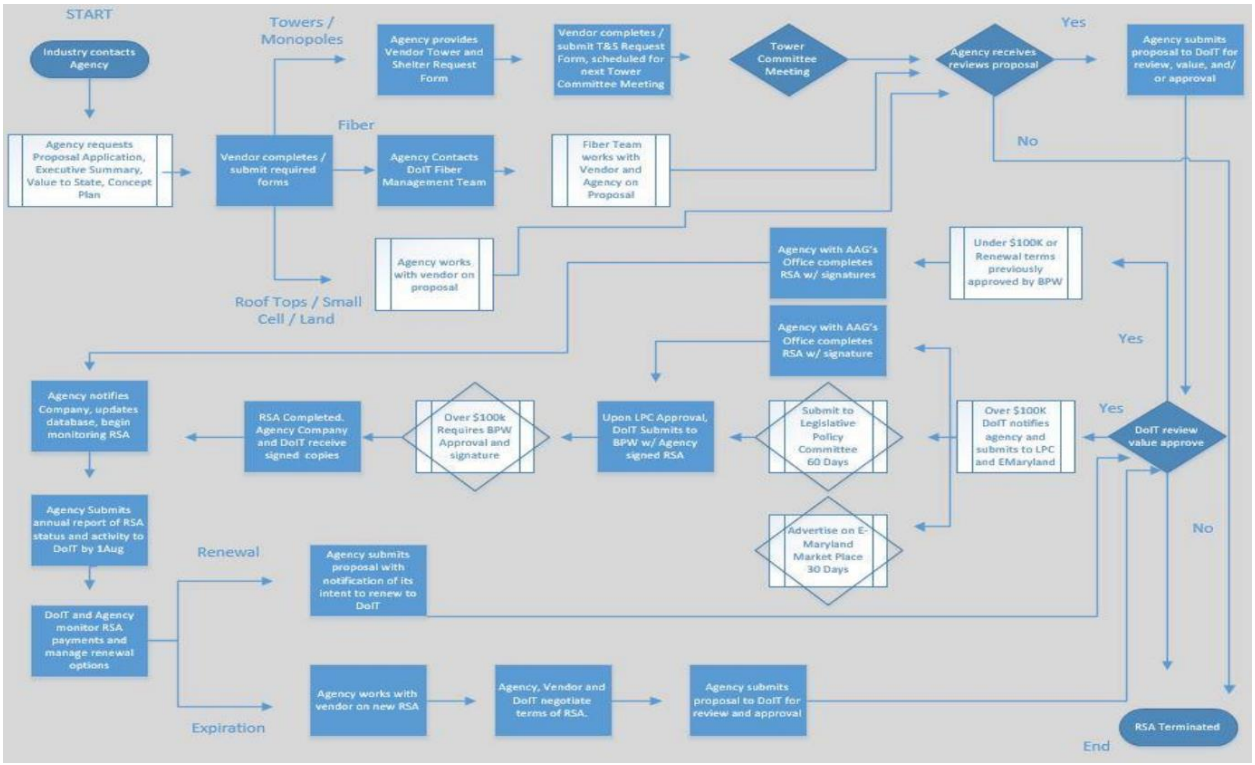


Figure D.4 Maryland Procedures of Resource Sharing Agreement Request – (Maryland DoIT, 2020)

The Resource Sharing Agreements (RSA's) are formal agreements similar to project agreements that contain specific details such as compensation terms and conditions. The RSAs are used when the MDOT SHA allows communication providers to place their facilities within State rights-of-way or on SHA property in exchange for compensation, equipment, and/or services (MDOT Utility Manual, 2021). Price,

(2016) mentioned that Maryland entered into more than 23 agreements since 1994 with different companies such as Verizon, Nextel, and AT&T. This agreement is based on resource sharing or in-kind compensation. As we said, Maryland relies on resource sharing to gain value from the telecommunication infrastructure. At the same time, the State may charge fees based on fair market value for longitudinal communications installations use of highway right-of-way (MDOT Utility Manual, 2021 and Resource Sharing Agreements Program Policy, 2020). The standard pricing rate schedule of fiber optics are shown in Table D.11 as follows.

Table D.16 Maryland Fiber Optics - Standard Pricing Schedule – (Maryland DOT Utility Manual, 2021 and Resource Sharing Agreements Program Policy, 2020)

Company Using State Property to Install its Own Fiber or Conduit	**Annual RATE**
Across the Fence Method (ATF)	
[Land Value of right of way by unit area] X [length of area occupied] X [width of area occupied] X [rate of return] X [factor to recognize degree of alienation of area] X [use factor]	
All Tunnels and Bridges **PREMIUM**	
Fiber Rate Calculation = (Rate X (Number of Strands/200)) X linear feet	**$3.75**
Empty Conduit = (Number of Conduits X Linear Feet X Rate)	**$3.75**
Company Using State Owned "Dark Fiber"	
Per Linear Foot (1 to 5279 feet)	
Dark Fiber Rate = (Number of Strands X Linear Feet X Rate)	**$0.03**
Per Mile 1 +	
Dark Fiber Rate = (Number of Strands X Number of Miles X Rate)	**$150.00**
Annual Maintenance Cost Per Mile	**$250.00**
Distance 1 Mile = 5,280 feet	
Rent Escalation Rate	**2.50%**
Base RSA Term	**10 Years**
Renewal Option	**(2-3) 10-year options**

The current rates for rights-of-way access for the longitudinal installation are determined by the use of the above formula. The average rate for the longitudinal installation and for empty conduct is about $3.75. The cost for a small cell facility permit is determined according to the following standard pricing schedule: (Maryland DOT Utility Manual, 2021 and Resource Sharing Agreements Program Policy, 2020)

- $500 as non-recurring fees (one time) for use on a single pole or strandline includes first five Antenna Attachments
- $100 for any additional antenna (when the initial application has six or more antennas)

- $1,000 for installation of a new pole (any number of antennas or attachments on the new pole)
- $270 for Recurring Fees (Annual) for each antenna (Annual Rate ($/ number of antenna/Year)

Note:

- *Rates include only fiber or copper specifically needed to support the project*
- *Rates include only 150 feet of fiber laterals necessary to support the project. Additional fiber charged at the State fiber rate*
- *No rent escalation rate*
- *Base RSA Term 5 to 10 Years*
- *Renewal Option (3-4) 5-year options*

Regarding the cell tower permit, Table D.12 illustrates the cell tower standard pricing schedule charged by MDOT SHA.

Table D.17 Maryland Tower (Macro Site) - Standard Pricing Schedule - (Maryland DOT Utility Manual, 2021 and Resource Sharing Agreements Program Policy, 2020)

Monthly Fee		ZONE 1	ZONE 2	ZONE 3	ZONE 4	AVG
	Avg. Daily Traffic (thousands)	< 50	50 - < 100	100 - < 150	150 +	Rate
Type I - Yr. 1	Base	$1,300	$1,500	$1,700	$1,800	$1,575
Type II - Yr. 1	Base	$2,200	$2,400	$2,900	$3,200	$2,675
Type III - Yr. 1	Base	$1,900	$2,600	$3,500	$4,200	$3,050
Type IV - Yr. 1	Base	$2,600	$3,200	$4,200	$4,800	$3,700
Rent Escalation Rate				3.00%		
Base RSA Term				5 to 10 Years		
Renewal Option				(3-4) 5-year options		
Type I - Paging, Community Repeater, etc.						
Type II - SMR, Narrowband PCS, etc.						
Type III - ESMR, Broadband PCS, Cellular, etc.						
Type IV - 6' - 9' Sat Uplink, FM Broadcast, LOS microwave, etc.						
Version CY19-1 as of 29Mar19						

The type of equipment and traffic determines the cell tower permit fee in the installation area according to zone level (from 1 to 4). According to the Table 20. The term of the agreement is between 5 to 10 years with a renewal option. In contrast, the average monthly fee ranges from $1,575 to $3,700 monthly, plus a

3% rent escalation increase. Table D.13 presents the annual colocation fees for the self-supporting lattice telecommunications tower that own by Maryland.

Table D.18 Maryland Annual Fee of Co-location on the Self-Supporting Lattice telecommunications tower (Resource Sharing Agreements Program Policy, 2020)

Initial Term	Annual Agreement Fee	Option 1	Annual Agreement Fee	Option 2	Annual Agreement Fee	Option 3	Annual Agreement Fee	Option 4	Annual Agreement Fee
Year 1	$42,000.00	Year 11	$56,444.49	Year 16	$65,434.63	Year 21	$75,856.67	Year 26	$87,938.67
Year 2	$43,260.00	Year 12	$58,137.82	Year 17	$67,397.67	Year 22	$78,132.37	Year 27	$90,576.83
Year 3	$44,577.80	Year 13	$59,881.96	Year 18	$69,419.60	Year 23	$80,476.34	Year 28	$93,294.14
Year 4	$45,894.53	Year 14	$61,678.42	Year 19	$71,502.19	Year 24	$82,890.63	Year 29	$96,092.96
Year 5	$47,271.37	Year 15	$63,528.77	Year 20	$73,647.25	Year 25	$85,377.35	Year 30	$98,975.75
Year 6	$48,689.51								
Year 7	$50,150.20								
Year 8	$51,654.70								
Year 9	$53,204.34								
Year 10	$54,800.47								

The MDOT SHA also determines the land rates for non-highway right-of-way; these rates can be seen in Table D.14 below:

Table D.19 Maryland Land Rates for Non-Highway Right-of-Way (Resource Sharing Agreements Program Policy, 2020)

Urban Monthly Rate ($/Month)	**$2,200.00**
Urban = Zones 3 & 4 of Tower Rates	
Rural Monthly Rate ($/Month)	**$1,200.00**
Rural = Zones 1 & 2 of Tower Rates	
Rent Escalation Rate	**2.50%**
Base RSA Term	**5 to 10 Years**
Renewal Option	**(3-4) 5-year options**
** Urban Sublease Adjustment ($/Month)	**$1,100.00**
** Rural Sublease Adjustment ($/Month)	**$700.00**
****(to be used for each subleased space only)**	

Massachusetts

Utility companies, including public telecommunications utilities, require obtaining permits when they need to install, relocate, remove, or maintain their utility facilities along, crossing over, or under all highway rights-of-way (Massachusetts General Laws Title XXII 166§25). Massachusetts Department of Transportation (MassDOT) in their Utility Accommodation Policy on State Highway Right of Way 2013, divided the right-of-way permits into two types, vehicular and non-vehicular. The non-vehicular permits are utilized for utilities works and drainage and are relevant to their Policy. The state laws Title XIV§81-Section 7D give MassDOT authority to grant easements within state highway locations for wires, pipes, poles, and conduits. In terms of fees for telecommunications companies' use of the rights-of-way, MassDOT should set reasonable rates and directly related to costs of attachment (Massachusetts General Laws Title XXII 166§25A).

In general, no fee schedule exists in MassDOT policy for other utility rather than telecommunication providers using the state highways right-of-way. MassDOT and Massachusetts Bay Transportation Authority (MBTA) set fees structure for access licenses, cellular and fiber optic. MassDOT and MBTA can enter into an agreement for licenses, leases, any other agreements with other providers to locate their facility into existing Massachusetts transportation-related properties. The standard rates and charges according to the market-based access to statewide coverage. Table D.15 shows the standard access licenses rate.

Table D.20 Massachusetts Standard Access Licenses Rate (MassDOT & MBTA Telecom and Energy Services)

Type	Administrative Fee	*Design & Construction and Structural Review Fee	License Fee
Standard Access Licenses	$1,000	$1,600 minimum	$1,000
Telecommunication and Utility Licenses (except Small Wireless Facility Licenses)	$1,000	$1,600 minimum	$5,000**
Small Wireless Facility Licenses	$500***	$1,600 minimum	$270 per facility

Note:

- **Only applicable when the scope of the proposed work warrants a Design & Construction Plan and Structural review. Fee is based on the actual cost to the MBTA of retaining engineering consultants with the expertise necessary to review the application.*
- ***Telecommunication and Utility Licenses are a minimum of $5,000.00 or will be assessed based on the public utility rates*
- ****Applicants will be charged an additional fee of $100 per facility in excess of the first 5 facilities requested in a single application*

The rates for the cellular tower for both MassDOT and MBTA-owned properties are shown in Table D.16. The fee structure is distributed by the type of cellular tower and the location of the tower.

Table D.21 Massachusetts Rates for Cellular Towers (MassDOT & MBTA Telecom and Energy Services)

Type of Tower/Antenna	Prime & Urban	Urban & Suburban	Rural
Micro Facility with 1 to 4 antennas per site. Omni directional or directional up to 8ft. in height, with equipment space or structure up to 100 sq. ft.	$34,778	$23,186	$18,548
Mini Facility with 5 to 9 antennas per site. Directional up to 5.5 feet in height or omni-directional up to 12 feet in height, with equipment space or structure up to 240 sq. ft.	$40,575	$28,983	$23,186
Macro Facility with 10 to 12 antennas per site. Directional up to 5.5 ft. in height or omni-directional up to 12 ft. in height, with equipment space or structure up to 480 sq. ft.	$47,530	$30,140	$23,186

The rate of fiber optic on MassDOT & MBTA-owned land is shown in Table D.17. The fee structure is distributed by the type of fiber (strands) and the zone location. The zones are based on the distance between stations and commuter rail (to the state line).

Table D.22 Rates for Fiber Optic on MassDOT & MBTA Owned Land (MassDOT & MBTA Telecom and Energy Services)

1. Longitudinal Rates*		
Zone	**Annual Rate**	**Per-Strand Multiplier**
Tunnels	$52.14 per linear foot	$.07 per-fiber
Urban	$12.34 per linear foot	$.05 per-fiber
Suburban	$5.74 per linear foot	$.03 per-fiber
Exurban	$2.55 per linear foot	$.02 per-fiber
2. Transverse Crossing Rates*		
Zone	**Annual Rate Per Line – 100 ft or less**	**Per-Strand Multiplier**
Urban	$11.26 per linear foot	$.05 per-fiber
Suburban	$4.95 per linear foot	$.03 per-fiber
Exurban	$2.55 per linear foot	$.02 per-fiber
3. Access Point Connections (Longitudinal ROW)		
▪ Turnpike: $1.42675 per-foot-per-year, plus $499.3524 per-fiber-per-year, plus annual CPIU (All Boston) escalation (2.5% min.) per year.		
▪ Other Rights-of-Way: No charge other than a permit and other one-time fees		
**Rates apply to any fiber optic cable with 216 strands or less. Multipliers are applied to all strands above 216 strands on a per-strand-basis. Cables with 432 strands or more are subject to negotiations.*		
Rates for Fiber Optic Opportunities on MBTA owned land are as follows:		
Zone	**Annual Rate Per Line**	**Per-Strand Multiplier**
Zone 1	$10.610 per linear foot	$.059 per-fiber
Zone 2	$6.051 per linear foot	$.059 per-fiber
Zone 3	$5.139 per linear foot	$.035 per-fiber
Zone 4	$2.736 per linear foot	$.024 per-fiber

Note:

- *Rates apply to any fiber optic cable with 216 strands or less. Multipliers are applied to all strands above 216 strands on a per-strand-basis. Cables with 432 strands or more are subject to negotiations.*
- *Transverse Crossings are $5,628 per occupancy escalated each year by 3%*

Michigan

The Michigan Compiled Laws Chapters 220 to 244, Chapters 247 and Chapters 460 mentioned that public utility companies, cable television companies, broadband companies, and municipalities could use

and access the public rights-of-way including, longitudinally within limited access highway rights-of-way. All utility companies must obtain permits when they need to install, relocate, remove, or maintain their utility facilities along, crossing over, or under all highway rights-of-way. Michigan Department of Transportation (MDOT) in their Utility Accommodation Policy 2011, does not consider wireless telecommunication service as a public utility to utilize state highway right-of-way. However, MDOT approves the construction and maintenance of wireless telecommunication facilities within state highway ROW according to the state law and after obtaining the appropriate permits. The policy also allows renewable energy facilities to occupy state highways right-of-way depend on the type of ROW, location, and ownership (public or private).

In terms of the permit fees, the fee for aerial and underground utility installation use of limited access rights-of-way is per mile for each control section. The total fee of longitudinal access is $1,000 per mile, with a minimum fee of $5,000 per project annually. The multiple transverse crossings in one control section shall be a single fee (MDOT Right-of-Way Construction Permits, 2014). Table D.18 shows the permit fees structure to occupy rights-of-way.

Table D.23 Michigan Permit Fee Schedule for Utilities and SCWF (Right-of-Way Construction Permits, 2014)

	Description	**Fees**
Construction Permit Fee Schedule Utilities		
Transverse	Trenchless Single Utility Tap	$90
Trenchless Pipe Installation		
	<= 6” diameter <=100’ long	$180
	<= 6” diameter >100’ long	$225
	> 6” diameter <= 100’ long	$275
	> 6” diameter > 100’ long	$410.00
	Pavement Cutting <=6’x6’	$275
	Pavement Cutting >6’x6’	$410
	Trenching-Gas, Oil, Water, Steam	$90
	Add cable to existing Duct	$90
	Aerial <=150’ long	$90
	Aerial >150’ long	$275
	Add cable to existing poles	$90
Longitudinal		
	Plowed Cable	$525
	Trench-Gas, Oil, Water, Steam	$525
	Add cable to existing duct	$90

	Description	Fees
	Aerial	$410
	Add Cable to existing poles	$90
	Limited Access Right of Way	$1,000 per mile, Minimum $5,000 per project
Annual Permit-Routine Maintenance & Emergencies		
	< 50 Activities per Region	$525
	>= 50 Activities per Region	$700
	Statewide, < 150	$1,575
	Statewide > 150	$2,100
Miscellaneous		
	Land Survey Individual	$30
	Land Survey Annual per Region	$90
	Land Survey Annual per Statewide	$270
	Limited access	$525
	Fence Installation	$90
	License Agreement Fee	$100
Attaching Fees - In-Bridge Structure		
	Not initially designed to accommodate	$410
	Initially designed to accommodate	$275
	Utility Relocation due to MDOT Project	No Charge
Small Cell Wireless Facility (SCWF)		
	Each SCWF co-located on an existing utility pole, or MOOT facility	$200
	Each SCWF installed on a new or replacement pole or support structure	$300
	Each SCWF with make-ready work.	$300
Annual Permit		
	Each new utility pole or support structure	$125
	Each co-located SCWF	
	additional rental rate-for each co-located SCWF on an existing MDOT pole	$30

Michigan Compiled Laws – Chapters 224. Sec. 19b mentioned that the county road commission should not charge a government entity or a provider an annual permit fee to occupy rights-of-way exceeding $300 per permit or $1,000 total for all permit fees per project. In a population of more than 250,000, the permit fee does not exceed $600 per permit or $2,000 for all permit fees per project. Regarding routine maintenance or repair work, the permit must be issued once per year, and the permit fees same as above. While Chapter 484.3108 address that for the period of November 1, 2002, to March 31, 2003, the provider shall pay an initial annual maintenance fee of $0.02 per each linear foot of public right-of-way occupied by the provider's facilities within a metropolitan area and then $0.05 each year.

Michigan Compiled Laws – Chapter 460.1315. Sec.15 address the permit fees of a small cell wireless facility as provided in Table 26. The fees will increase by 10% every five years. Chapter 460.1317 illustrates the application fee for zoning approval. A new wireless support structure or modification of an existing wireless support structure does not exceed $1,000. For a new small cell wireless facility, modification of an existing small cell wireless facility does not exceed $500. While Chapter 460.1313. Sec. 13 mentioned that collocation charges do not exceed $20 annually unless a utility pole was erected by or on behalf of the wireless provider, then $125 annually. The fees of the collocation will increase by 10% every five years. Chapter 460.1319 mentioned that the rate for the collocation of small cell wireless facilities on authority poles shall not exceed $30 per year per authority pole and increased by 10% every five years. While the rate for a wireless provider to collocate on a non-authority pole in the rights-of-way shall not exceed $50 annually per no authority pole and increased by 10% every five years (Chapter 460.1321). Michigan Compiled Laws – Chapter 484.3106. 484.3106 mentioned that the provider should file an application for a permit and pay a one-time application fee of $500.00 to each municipality to use a public right-of-way.

Minnesota

Minnesota Statutes Chapters 237 – 238 and utility accommodation policy authorize public utilities, private lines, and telecommunication providers to use and occupy the right-of-way to install and collocate their facilities on trunk highway right of way. The policy does not consider renewable energy as a utility but may be allowed to occupy a portion of a trunk highway right-of-way and authorized wireless providers to install fiber optic, pole, and small wireless facilities in interstate. The Statutes Chapters 238.35 also authorize licensed communication providers to use existing utility easement to install communications system components without paying additional compensation to any other than the owner of the utility easement. Recent legislation limits the authority of local governments to impose certain fees or require special permits for the small wireless facility. In lieu of permit fees, sub-section 237.163.7(d) restricts collecting fees through in-kind services as a condition of consent to use the public right-of-way or obtain a small wireless facility permit.

In terms of the permit fees, Minnesota statutes chapter 237 and administrative rules section 7819.1000 mentioned that the permit fee must be on an allocation among all users of the public right-of-way, including the local government unit itself. The permit fees imposed by the local government on telecommunications right-of-way users must be reasonable and based on the actual costs of managing the public right-of-way. Minnesota statutes chapter 237.163 subsection 6 (e) address the small wireless facility's collocation and attachment permit fees. The fee structure will be charged annually as follow:

- Up to $150 per year for rent to occupy space on a wireless support structure.
- Up to $25 per year for maintenance.

Regarding the electricity used to operate a small wireless facility should be monthly otherwise, the rate will be as follow:

- $73 per radio node less than or equal to 100 max watts.
- $182 per radio node over 100 max watts

Or the small wireless provider will pay the actual costs of electricity if the actual costs exceed the above amount.

Mississippi

The Mississippi Administrative Code-Title 37 prohibited installing new utility longitudinally within the control of access lines and the median area of any freeway, except in special conditions. Mississippi Code-Title 21(§21-27-3 & 5) gives municipalities the authority to grant any person, corporation, or association the right to use the right-of-way for utility facilities. However, such a franchise shall not be exclusive and granted for a longer period than twenty-five years. Unfortunately, there are no formal internal DOT policy exists to figure out the permit fees structure. Chamberlain, (2018) mentioned that Hattiesburg City Council establishes a permit application and licensing process for small cell infrastructure. The city can charge a permit fee of $1,000 per node on public rights-of-way and $500 to collocate wireless facilities on existing structures. The city also can charge an annual fee of $500 per structure for the duration of the permit. Morton, (2021) mentioned that bill number SB 2003 addresses the Wireless Facilities Deployment Act to allow a wireless provider to install their small wireless facility within the state right of way under certain conditions. Generally, the bill does not impose ROW use fees or permit MDOT to generate revenue from the wireless provider.

Missouri

All public utilities, including telecommunications providers, require obtaining permits when they need to install, relocate, remove, or maintain their utility facilities along, crossing over, or under all highway rights-of-way (Missouri Revised Statutes chapters 46-70 - Title VI). Missouri statutes chapter 67 govern the permit fees rate to collocate small wireless facilities. There are two types of fees, application fees (onetime fee) and attachment rental fees calculated on an annual, per-pole basis. All fees must be based on actual, direct, and reasonable administrative costs. The total fees for any application for installation or collocation of small wireless facilities on existing authority poles shall not exceed the following:

- $100 per small wireless facility for collocation on existing authority poles.
- $500 per pole for the installation, modification, or replacement of a utility pole

The application fee should be waived when the requesting party is a governmental entity. A small wireless facility's collocation rate to an authority pole shall not exceed $150 per authority pole per year. The rate of rental of collocation must be according to the fair current market rates. The Missouri Department of Transportation (MoDOT) uses appraisals to determine the fair market value (Missouri Statutes chapter 67.5102). While chapter 67.5113 make restriction to the authority to enter into a services agreement with the wireless provider such as in-kind services except under certain condition.

Montana

Montana Code -Title 69 authorizes the public utility to use public right-of-way for their utility lines and facilities. In contrast, the Administrative Rules of Montana (ARM) prohibited full controlled-access facility right-of-way occupancy, except in special conditions. Montana Department of Transportation (MDT) has no formal policy related to the permit fees either to telecommunication or any type of utility. Some cities, such as Missoula, update their rules on deploying wireless facilities and the collocation of wireless facilities on existing structures. However, this rule prohibits wireless deployments on public rights-of-way (Chamberlain, 2018).

Nebraska

Nebraska Administrative Code, Nebraska Statutes chapters 39, 86, and utility accommodation policy authorize public utilities and telecommunication carriers to use and occupy the right-of-way to install and collocate their facilities on highway right of way. Nebraska Department of Transportation (NDOT) in their policy of Right-of-Way Permits, (2016) address performance guarantee schedule fees for the utility company as follow:

- Minimum of $2,000 for commercial access applications.
- Minimum of $500 for all other applications.
- Minimum of $100 for all temporary irrigation pipe crossings

The number of performance guarantee is based on the number of permits, not on the number of applications required. Also, they waived the fees of performance guarantees for city, county, state, and federal governments. Nebraska Revised Statutes – Chapter 86-164 (3) (a) also address the permit fees for telecommunications carrier crossing a railroad right-of-way. The telecommunications carrier only pays a one-time standard crossing fee of $1,250 for each applicable crossing. In addition to the standard crossing fee, the telecommunications carrier shall also reimburse the railroad for any reasonable and necessary flagging expense associated with the line, wire, or cable placement.

In terms of the permit fees for the small wireless facility within the right-of-way, NDOT set fair, reasonable, and cost-based application fees to cover their administrative cost for the use and occupancy of state-owned property (Nebraska Statutes chapter 86-1237). The same chapter (86-1237) prohibits charging permit fees for routine maintenance of small wireless facilities or replacing similar equipment in small wireless facilities. While chapter 86-704 prohibits municipalities from collecting fees through the provision of in-kind services by a telecommunications carrier as a condition of consent to the use of a public highway.

Nebraska Statutes chapter 86-1239 set the schedule permit fees to install and collocate the small wireless facilities within rights-of-way. Subsection (2) (b) and (c) illustrate the application permit fees as follows:

- No exceed $500 application fees for collocation on an existing or replacement authority pole for up to five small wireless facilities on the same application
- $100 for each additional small wireless facility on the same application
- No exceed $250 for the installation, modification, or replacement of a utility pole

Subsection (2) (a) prohibits charging any additional amount for using a right-of-way from a telecommunications carrier if the authority charges occupation taxes under section 86-704. Suppose the telecommunications carrier does not pay the authority's occupation tax. In that case, a rate of $250 for each small wireless facility each year or a fee equal to the occupation tax must be applied. As mentioned in sub-section (3), the rate for collocation of a small wireless facility on an authority pole in the right-of-way does not exceed $20 per authority pole per year.

Nevada

Nevada Revised Statutes Title 58 and the Right-of-Way policy authorize public utilities and telecommunication carriers to use and occupy the right-of-way to install and collocate their facilities on highway right-of-way after obtaining an encroachment permit. The policy also permits the use of the rights-of-way of the non-interstate system for telecommunications facilities if it supports federal and state laws. The installation of any telecommunications facility must be underground on a state highway or right-of-way unless the Nevada Department of Transportation (NDOT) determines that an overhead installation is appropriate (NDOT Right-of-Way Manual, 2019). NDOT can compensate the telecommunications provider for longitudinal access or other use within the right-of-way of the non-interstate system (Nevada Revised Statutes, Title 35 NRS 408.5502). This can be in cash (lump-sum payment or in annual installments) or with in-kind compensation or a combination of them. The NDOT can also enter into agreements for in-kind compensation with telecommunications providers for longitudinal access to the right-of-way of the interstate system. NDOT shall value the in-kind compensation as follows:

- Facilities for Department Use Only: (i.e., conduit, fiber, bandwidth) valued on a present value basis at the estimated, reasonable cost.
- Warranties; Maintenance, and Operating Covenants: present value of equipment, conduit, fiber, or other components warranties, based on the reasonable, estimated cost of the purchasing from manufacturers
- Summation of In-Kind Values: the total present value of the in-kind compensation is the sum of the present values determined above.

If the compensation trade value received from a telecommunications provider is less than the trade value of the longitudinal access provided by the NDOT then annual, or lump sum monetary compensation must apply (Nevada Revised Statutes, Title 35 NRS 408.55025). Suppose the compensation agreement contains more than one telecommunications provider. In that case, the telecommunications providers can share the burden of the compensation owing to the NDOT on a fair, reasonable, and equitable basis. In this case, the NDOT shall value the in-kind compensation as follows:

- Joint Trenching: the present value of the cost for the joint trenching for placing conduit, fiber, and other facilities of both providers
- Other Jointly Used Facilities: the present value of the cost to the telecommunications provider of providing any other telecommunications facility which is shared jointly by the provider.

In 2021, NDOT published Terms and Conditions Relating to Right-of-Way Occupancy Permits. Besides Nevada Statutes Title 35 NRS 408, this document illustrates the processing of the right-of-way occupancy permit applications and the fee structure. The permit fee of underground and aerial installations for the non-telecommunication facility (i.e., gas, sewer, electric lines, water lines, storm drains) is as follow:

- $ 600 Less than 2.5 miles
- $1,000 2.5 miles to 5 miles
- An amount equal to the NDOT administrative cost Greater than 5 miles

Any local governmental entities are exempt from the above fees (Title 35 NRS 408). In contrast, the fees to process applications for telecommunication facilities in state highway right-of-way are shown in Table D.19.

Table D.19 Nevada Telecommunications Facilities Fees (Nevada Statutes, Title 35 NRS 408)

Telecommunication Facilities	Application Fee
New facilities less than 2.5 miles	$600 $175 not refundable
New facilities greater than 2.5 miles and less than 5 miles	$1,000 $375 not refundable
New and existing facilities five miles in length or longer	$1,000 for the first 5 miles and $600 for each additional 2 miles
Annual occupancy permits	$9,500 $500 not refundable
Existing Facilities less than 5 miles	$500 $125 not refundable

In addition to the fees for new and existing facilities less than five miles in length, NDOT may charge an amount equal to but not more than 10% of the published fee if the cost to review an application is more than the amount of the fee charged (Nevada Statutes, Title 35 NRS 408).

New Hampshire

According to the state law Title XX, all public utilities are required to obtain a permit or license for any utility installations within the highway right-of-way. For the use of state rights-of-way by the telecommunications provider, the state laws allowed the commissioner to execute contracts, leases, and licenses, whether easement or fee-owned, for allowing the installation of telecom facility. Such agreements must be of reasonable value and not exceed more than ten years in the contract term. A utility facility can be attached to a bridge structure under special cases. In contrast, private utilities are not permitted within the highway right-of-way (New Hampshire DOT Utility Accommodation Manual, 2017). The Statutes - Title XXXIV prohibited railroad to charge any municipality a permit fee for laying water or sewer lines under existing railroad tracks.

Chamberlain, (2018) mentioned that the legislature passed a bill in 2000 outlining the permitting procedure of wireless facilities and collocation of wireless facilities on existing structures. In general, no permit fee structure exists for permitting telecommunication facilities or utilities using the state highways right-of-way. The NHDOT had a Utility Accommodation Manual published in 2017, but unfortunately, it does not represent any details about the permit fee amount.

New Jersey

New Jersey Statutes Annotated (NJSA) Title 16, 27, and 48 authorize public utilities and wireless communications to use and occupy the right-of-way to install and collocate their facilities on the right-of-way after obtaining the proper permit. The New Jersey Department of Transportation (NJDOT) will be treated as special cases for any private utilities request to use and occupy the right-of-way. NJ Rev Stat § 48:19-17 also gives water companies to lay their pipes in public rights-of-way free from all charges to be made by any authorities. NJSA and NJDOT set different types of permit fees. NJ Administrative Code (NJAC)-Title 16 and the document of Permits and Fees (2019) illustrate the permits fee of bridge attachments and other different utility works as shown in Table D.20. The duration of the permits varies from one to two years, depending on the type of utility works.

Table D.24 New Jersey Utility Permit Fees – (NJAC-Title 16 and NJDOT 2019)

Type	Number	Unit	Application	Permit	Extension	Permit Term in Years
Utility Openings	0 to 20	SF	$525	$200	$200	2
	20 to 200	SF	$790	$265	$265	
	Greater than 200	SF	$1,185	$395	$395	
Poles	1 to 10	Unit	$330	$100	$100	2
	Greater than 10	Unit	$625	$200	$200	
Drainage Facilities	1 to 5	Unit	$230	$65	$65	1
	Greater than 5	Unit	$525	$200	$200	
	0 to 200	SF	$230	$65	$65	
	Greater than 200	SF	$525	$200	$200	
Bridge Attachments	0 to 100	LF	$395	$130	$130	1
	Greater Than 100	LF	$790	$265	$265	
Wireless Communications Site Survey	Annual	Unit	$790	$265	$265	1
Railroad Grade Crossings	Unit	Unit	$525	$200	$200	1
Telephones	Unit	Unit	$250	$75	$75	1

The NJDOT in their Guidelines and Procedures for Wireless Telecommunication Licenses (1998), addresses the compensation structure of licensing and construction of wireless telecommunications sites within the right-of-way of Interstate and NHS highways. Their contract rates are based upon three zones, geographically divided between the Turnpike's northern, central, and southern regions. Each of these zones included resource sharing by the Turnpike on their sites. The annual rates for each zone are: $30,000, $25,000, and $15,000 respectively. For their agreements, the annual rates are divided geographically into north and south. The annual rates range from $40,000 to $45,000 for the northern district and $30,000 to $35,000 for the southern district. Although NJDOT uses the “Historical Experience” method to evaluate the market conditions/fair market. All annual rates depend on the

carriers' desired equipment and location. The site was divided into four categories, including equipment cabinets and fence with required 24-hour access as follow:

Category 1

- Antennas attached to an existing structure
- Whip Antennas 1"to3" in diameter and 8'to16' high
- Panel Antennas 2" to18" wide x 2'to 6' high x 2"to12" deep
- One to 12 antennas are possible per site.

Category 2

- Attached to replacement communication towers, light poles, high mast lighting towers, CCTV poles, utility poles, etc.
- Antennas same as category 1

Category 3

- New poles less than 70 feet in height,
- Antennas same as category 1

Category 4

- New monopoles and new Lattice Towers more than 70 feet in height.
- Antennas same as category 1

New Mexico

New Mexico Administrative Code Title 17 and 18 authorize any utility owners to use and occupy the right-of-way to install and collocate their facilities after obtaining a utility permit. New Mexico Statutes Chapters 3 and 19 also authorize the commissioner to grant rights-of-way and easements over, upon, or across state lands or franchises to any person to install utility facilities upon payment not less than the minimum price for the lands, used, as fixed by law. NMDOT in their Right-Of-Way Handbook (2016), mentioned that the term of longitudinal utility facilities permits within the access-controlled freeways should not exceed 25 years, and the fees or other compensation must be reasonable for the occupancy of the right-of-way by the utility. Kraus, et al, (2020) mentioned that New Mexico includes small wireless facility installation excluding interstates or state highways in their new legislation. At the same time, the New Mexico Department of Transportation (NMDOT) is allowed to install all types of wireless telecommunications installations within state highway rights-of-way or on their owned property (NMDOT Broadband and Telecommunications Manual, 2020). They also allowed communications equipment to co-locate on wireless facility towers at no cost to NMDOT.

NMDOT (2020) set the fees to wireless telecommunications installations placed within state highway rights-of-way or on NMDOT owned property. They may waive the permit fees for all equipment installed for the use of the NMDOT or other state agencies. The tower fee structure is based on the type of tower, geographic location, and average daily traffic, as shown in Table D.21 below:

Table D.25 New Mexico Fees for Wireless Telecommunications Installations - (NMDOT Broadband and Telecommunications Manual, 2020)

Towers less than 50 ft based on the type of tower	
Type of tower	**Fee per year**
Self-Supporting Tower/Antenna	$3,500
Monopole/Antenna	$2,000
Attachments to Existing Utility/Light Poles	$1,500
Co-Location on NMDOT Tower	$3,500
Towers over 50 ft based on geographic location and average daily traffic counts	
Location	**Fee per year**
URBAN or where ADT is 2,000 or more	$9,000
SUBURBAN or where ADT is less than 2,000 (and not deemed RURAL)	$6,000
RURAL along states highways and local roads in rural areas	$3,000
Tenants on Existing Self-Supporting Tower	$3,500

NMDOT uses the same structure fees as Georgia regarding the fiber-optic cable, as shown in Table 16. In lieu of fees required, the NMDOT has the authority to enter into an agreement with a wireless telecommunications provider for payment of blanket (lump sum) fees to cover all utility operations on State rights-of-way on an annual basis. The blanket payment is $5,000 per mile for fiber optic placed within state access-controlled highway rights-of-way (NMDOT Broadband and Telecommunications Manual, 2020). NMDOT may reduce the permit fees for those who install shared resources on behalf of the NMDOT.

New York

New York Codes, Rules, and Regulations Title 17 and Consolidated Laws authorize any utility owners and a telegraph corporation to use and occupy the right-of-way to install and collocate their facilities on the right-of-way after obtaining a highway work permit from the NYS Department of Transportation. New York Department of Transportation (NYSDOT) offer the right to install and use the communications facilities within its interstate highway ROW through a "Request for Proposals" (RFP) process and within the right-of-way of specific portions of freeways through an open competitive process (Highway Design Manual - Chapter 13 – Utilities, 2015). NYSDOT has developed a fiber-optic permit fee schedule for use and occupancy of the right of way based on fair market value (Consolidated Laws of New York - TCP - Transportation Corporations Section 7). The fiber optic permit fees are classified into three types: longitudinal aerial, longitudinal underground, and transverse crossing. The fees are also based on geographical locations based on population density: Manhattan, New York City Surrounding Area, and Upstate (Metro Areas & Remainder of Upstate) (Fiber Optic Permit Fee Schedule, 2019).

NYSDOT (2019) mentioned that through a use and occupancy permit, the existing fiber optic lines are required to pay fees as well as those with new installations. They also divided the fiber optic rates into Upstate and Downstate amounts, and the minimum permit fee for the entire state is $200 per year, and all rates will increase annually by 2% (Fiber Optic Permit Fee Schedule, 2019). Table D.22 shows the fiber optic rates of upstate and according to the fiber optic installation type, while Table D.23 shows the fiber optic rates of downstate locations.

Table D.22 New York Upstate Fiber Optic Rates – (Fiber Optic Permit Fee Schedule, 2019)

Longitudinal Aerial: Per-Foot-Per-Year-Per-Cable			
By Cable Size	**TIER 1**	**TIER 2**	**TIER 3**
Up to 96 strands	$1.96	$1.01	$0.26
97 to 216 strands	$2.81	$1.43	$0.42
217 or more strands	$4.38	$2.44	$0.80
Longitudinal Underground: Per-Foot-Per-Year-Per-Cable			
By Rate (Up to 288 Strands)	$3.98	$2.12	$0.58
Multiplier (per-strand for each additional fiber exceeding 288 - strands)	$ 0.0186 per strand	$ 0.0159 per strand	$ 0.0106 per strand
Transverse Crossing - Underground and Aerial: Per-Year-Per-Cable			
Up to 215 strands	$955	$618	$200
216 to 431 strands	$1,485	$976	$316
432 or more strands	$2,547	$1,697	$549

The appropriate rate tier is identified for each metro area and the remainder of the state as follow:

Tier 1

- Buffalo-Niagara Falls Metro Area
- Rochester Metro Area
- Albany and Capital District Metro Area
- Syracuse Metro Area

Tier 2

- Utica-Rome Metro Area
- Binghamton Metro Area

Tier 3

- The remainder of the Upstate Region

Table D.26 New York Downstate Fiber Optic Rates – (Fiber Optic Permit Fee Schedule, 2019)

Manhattan Area				
Manhattan Longitudinal Underground: Per-Foot-Per-Year-Per-Cable				
Manhattan Area	**RATE**	**Multiplier (per-strand for each additional fiber above 288 -strands.**		
Below 59th Street - Manhattan	$22.66	$ 0.0186 per strand		
Above 59th Street - Manhattan	$16.97	$ 0.0159 per strand		
Manhattan Underground and Aerial Transverse Crossing: Per-Year-Per-Cable				
Manhattan	$ 1,590 per crossing			
Downstate – Non-Manhattan				
Longitudinal Aerial: Per-Foot-Per-Year-Per-Cable				
CABLE SIZE	**TIER A**	**TIER B**	**TIER C**	**TIER D**
Up to 96 strands	$2.94	$2.07	$1.01	$0.53
97 to 216 strands	$3.87	$2.71	$1.54	$0.76
217 or more strands	$5.68	$3.61	$2.07	$1.17
Longitudinal Underground: Per-Foot-Per-Year-Per-Cable				
By Rate (Up to 288 Strands)	$3.59	$2.17	$1.32	$0.74
Multiplier (per-strand for each additional fiber exceeding 288	$ 0.0186 per strand	$ 0.0159 per strand	$ 0.0117 per strand	$ 0.0100 per strand
Transverse Crossing - Aerial and Underground: Per-Year-Per-Cable				
Crossing	$1,590 per crossing	$1,590 per crossing	$1,590 per crossing	$1,590 per crossing

The Non-Manhattan Areas include the Bronx Counties, Kings, Queens, Richmond, Westchester, Rockland, Orange, Nassau, and Suffolk. The downstate location is as follow:

- Tier A: (Bronx, Queens, Kings)
- Tier B: (Richmond, Nassau, Westchester, Rockland)
- Tier C: (Suffolk County West (West of William Floyd Parkway))
- Tier D: (Orange County and Suffolk County East (East of William Floyd Parkway))

North Carolina

North Carolina Administrative Code – Title 19A and the Statutes – Chapter 136 authorized public utilities and wireless providers to construct and collocate their facilities within the rights-of-way after applying for and obtaining a permit from the North Carolina Department of Transportation (NCDOT). The legislation does not mention the fees structure to these permits. The NCDOT prohibits traditional cell towers and private-use small cell nodes in NCDOT right of way except in special conditions. Only public-use small cell nodes and antenna systems are permitted (Utilities Accommodations Manual 2021). The utility manual also encourages the Dig Once, co-location of facilities, and attachment of new small cells to existing poles. Unfortunately, the policy does not represent any details about the permit fee or any compensation to use the rights-of-way.

Chamberlain, (2018) addresses a permit fee for a wireless facility using rights-of-way. The author mentioned that in 2017 bill number HB 310 declared that wireless services providers could access the public rights-of-way and the ability to collocate and attach to poles and existing structures in the public rights-of-way. The permit fees according to the bill are as follow:

- $100 for the first five small wireless facilities,
- $50 for each additional collocation.
- $500 as consultation fee.

North Dakota

North Dakota Century Code Title 24 and 49 authorized utility companies to use and occupy the streets for telephone, telegraph, electric light, water, and gas system. Also, wireless communication facilities may be attached to NDDOT owned facilities (NDDOT A Policy for Accommodation of Utilities on State Highway Right-of-Way, 2020). North Dakota DOT does not participate in any fiber sharing or require in-kind services from a telecommunications company as a condition of the use of the public right-of-way (North Dakota Century Code Title 49-21-27). Title 49-21-26. They have prohibited any fee from a telecommunications company for using its right-of-way other than a fee for the agency's management costs. While title 49-09.1-05 set a one-time standard crossing of $750 for each crossing for any utility need to cross a railroad right-of-way. The crossing fee is in lieu of any other fees, licenses, or charges to reimburse the railroad for the direct expenses except the expense of flagging associated with a crossing.

North Dakota DOT (2020) set the permit fee for the installation of utility facilities on the right-of-way in their utility accommodation policy. The fees structure of using rights-of-way by utility companies is as follows:

- $100 for a crossing
- $50 each for any additional crossings on the same permit
- $200 for an open cut crossing plus $50.00 minimum to review detour layout and signing plans
- $200 for a longitudinal facility
- $100 for bridge attachments plus $50 minimum to review location and method of attachment
- $50 for down guys, push braces, soil borings, test wells
- $50 minimum for each inspection required after the first inspection

US Government, State, City, County, Township, or other governmental organizations and Tribal owned facilities waived from the above fees structure (NDDOT A Policy for Accommodation of Utilities on State Highway Right-of-Way, 2020).

Ohio

Ohio Revised Code Title 49 and 55 authorize public utilities to use and occupy the right-of-way to install and collocate their facilities on highway right of way after obtaining permits from the Ohio Department of Transportation (ODOT). In their report, Kraus, et al, (2020) mentioned that Ohio passed legislation on small wireless facilities pertained only to the municipal rights-of-way rather than state-owned rights-of-way. While Ohio Revised Code Title 49 and 55 authorize and allow wireless communications facilities to use the state rights-of-way if there is sufficient space for safety purposes regardless of the nature, the type of rights-of-way, or the type of ownership. There is no permit applications fee for the use of the right-of-way, but if the utility use is on a state route within city limits, then cities have the ability to impose permit fees (Ohio Revised Code – Title 49). The fees shall be reasonable and cover the municipal corporation administrative cost. The Ohio code Title 49 specifies a consolidated application to small cell wireless facilities that do not exceed a one-time fee of $250 per small cell facility and are adjusted by 10% every five years. Regarding the attachment to a wireless support structure, a municipal corporation's approved term is not less than ten years with a renewal of five years. The total annual charges for the attachment do not exceed $200 per small cell facility collocated on a wireless support structure owned by the municipal corporation and adjusted by 10% every five years. A municipal corporation may waive attachment or consolidated application fees for any governmental entity or a charitable organization (Ohio Revised Code – Title 49).

Ohio Administrative Code Rule 4901:1 and Ohio Revised Code Title 49 allows Ohio DOT to charge for longitudinal communications facilities use the rights-of-way. Still, the state does not mention any fees structure in their current policy to implement such fees. For the attachment fee, the code allows charging fee in accordance with the cable pole attachment rate formula established in Title 47 224(d) from the Code of Federal Regulations. Wilmot, (1998) and Kraus, (2020) present the fees structure for telecommunication facilities installed within rights-of-way. Wilmot, (1998) Table A.5 and Table A.6 clarify the fees for installation of towers and fiber optic lines in ROW. The fee structure depends on two factors: whether the tower location is in an urban or rural area, and the other factor is how many antennas the tower is designed to carry (type of tower). While Kraus, (2020) mentioned that Ohio generates revenue from communications cell towers installed in the state rights-of-way. The communications cell towers are installed in the state non-controlled and limited access rights-of-way. The installations in limited access are allowable if they are not affecting the safety of the rights-of-way. For the communications cell towers installations, the DOT charged a one-time of $1,500 application fee for a master license agreement and an annual fee of $1,500 for each site license agreement and increased by 2% each year (Kraus, 2020). Also, the state charges fees from the line-of-sight tower in the state rights-of-way that is part of a wireless connection from New York to Chicago. In addition to the initial fee, Ohio charges fees more than they typically charge from wireless towers, and they charge about $50,000 annually for the use of the tower (Kraus, 2020).

Oklahoma

Oklahoma Statutes Title 69 authorize public utility companies and cable television systems to use and access the public rights-of-way. Utility companies and cable television systems require obtaining permits to install, relocate, remove, or maintain their utility facilities along, crossing over, or under public rights-of-way. Oklahoma Department of Transportation (ODOT) does not have a policy related to the utility accommodation on their website. There are no details about the utility permit fee or any compensation to use the rights-of-way except as mentioned in Oklahoma Administrative Code – Title 730 for the attachments permits to state bridges. Table D.24 represents the schedule of annual license fees of utility facilities attached to state bridges.

Table D.24 Oklahoma Annual Fees of Utility Facilities Attached to State Bridges (Oklahoma Administrative Code – Title 730)

Utility Line Category	Basis of Fee	Fee/Annually*
TV Cable	Per cable, 1" or less diameter	$200
	Per cable, over 1" in diameter	$300
Electric	Per Conduit, Voltage: 0 V through 3,300 V	$100
	Per Conduit, Voltage: Over 3,300V through 13,800V	$200
	Per Conduit, Voltage: Over 13,800V through 33,000V	$300
	Per Conduit, Voltage: Over 33,000V	$400
Petroleum Gas Products	Nominal Pipe Diameter in Inches	$50x Pipe Diameter ($100minimum)
Petroleum Fluid Products	Nominal Pipe Diameter in Inches	$50x Pipe Diameter ($200minimum)
Water Lines	Nominal Pipe Diameter in Inches	$50 x Pipe Diameter - $100 ($100 minimum)
*Double Fees (amounts, rates, minimums) for Bridges over 300' in length		

US Government, state agencies, county governments, city governments, townships, and any public non-profit waived from the above fees structure (Oklahoma Administrative Code Title 730:30-7-2). Regarding the telecommunications facility within the rights-of-way, Kraus, et al, (2020) mentioned that in 2018 Oklahoma passed small cell legislation applied to municipalities rather than the Oklahoma Department of Transportation.

Oregon

Oregon Revised Statutes (ORS) and Oregon Administrative Rules (OARs) authorized utility companies to use and occupy their facility within the rights-of-way after obtaining the proper permit. Also, a wireless communication facility may be attached to Oregon Department of Transportation (ODOT) owned

facilities. According to the Oregon Utility Relocation Guide (2018), there are three types of permits in ODOT; standard permits, "X" permits, and encroachment permits. The utility owner issued the standard permit for the installation, maintenance, or relocation of their facility within state highway ROW. The "X" permit is issued to a utility owner that originally occupied a portion of the ROW and had a compensable interest or prior right, and the State did not purchase the existing easement rights. In contrast, an encroachment permit is issued for activity along a state highway other than a normal transportation activity such as utility installation.

Oregon Administrative Rules (OARs) 860-028-0110 set clear standards for rental rates and charges for attachments to poles and conduits owned by utility companies. These rental rates do not include any other costs such as permit application and make-ready work, and these charges will be based on administrative costs and will be charged in addition to the rental rate. The pole attachment rental rate is divided into two types, rental rate per foot and rental rate per pole. The rental rate per foot is computed by multiplying the pole cost by the carrying charge and then dividing the product by the usable space per pole. At the same time, the rental rate per pole is computed as the rental rate per foot multiplied by the licensee's authorized attachment space. The conduit rental rate is calculated by linear foot. The rate is calculated by multiplying the percentage of conduit capacity occupied by the net linear cost of the conduit and then multiplying that product by the carrying charge.

Oregon Revised Statutes (ORS) Volume 06 authorize a municipality to collect from telecommunications carriers operating within the municipality and using the right-of-way a privilege tax in an amount that may not exceed 7% of the gross revenues of the telecommunications carrier operates within the municipality. The ORS mentioned that any telecommunications carrier paying the privilege tax should not be required to pay any additional fee or compensation, including the free use or construction of telecommunications facilities and equipment, to the municipality for its use rights-of-way. While Oregon Revised Statutes (ORS) Volume 07 authorize Department of State Lands to impose a one-time application fee applying for an easement to construct water, gas, electric, or communication service line as following:

- $750 on state land other than the territorial sea.
- $5,000 on state land located within the territorial sea.

Kraus, et al. (2020) mentioned that ODOT generates revenue from the macrocell communications using the rights-of-way. They are looking for in-kind values from the telecommunication providers such as dark fiber. The lease rate of the macrocell range from $500 to $60,000 annually and is revisited every five years, and it is based on the type of equipment and the population center it serves. The lease rate of the macrocell communications must be according to fair market value for certain types of uses of the rights-of-way.

Pennsylvania

Pennsylvania Code Title 67 and Pennsylvania Department of Transportation (PennDOT) in their policy authorize public utilities and wireless communication facilities to use and occupy the right-of-way to install and collocate their facilities on highway right of way after obtaining a utility work permit. The small cell facilities are prohibited on highway structures (bridges, etc.) and in limited-access highway right-of-way (PennDOT, 2018). In regulating occupancy of its highways by utilities, PennDOT does not require ROW access fees, but they charge (onetime) issuance (application) and inspection fees. Table D.25 illustrates the variety of fees depending on the type of work. The permit application fees range

from $5 to $50, while the permit inspection fees range from $2 to $80 depending on the type of work to be inspected (Pennsylvania Code – Title 67).

Table D.27 Pennsylvania Highway Occupancy Permits Fees - (PennDOT, 2018 and Pennsylvania Code Title 67)

Type of work Permit	**Fees**
General Issuance Fees	
Utilities	$50
Driveways	
i. Minimum Use	$15
ii. Low Volume	$30
iii. Medium Volume	$40
iv. High Volume	$50
▪ Other (Curb, Bank Removal, Sidewalk & Curb, etc.)	$20
Supplement Fee (each 6-month time extension or HOP revision)	$10
Emergency Permit Card (each card)	$5"
General Inspection Fees	
Driveways	
i. Each Minimum Use	$10
ii. Each Low Volume	$20
iii. Each Medium Volume	$35
iv. Each High Volume	$50
Underground Facilities (Total each 100 linear feet increment or fraction thereof)	
▪ Opening in Pavement	$40
▪ Opening in Shoulder	$20
▪ Opening outside of Pavement & Shoulder	$10
• If Longitudinal Opening Simultaneously Occupies Two or More Areas Only Higher Fee Charged	
Surface Openings (Less than 36 square feet)	
i. Opening in Pavement	$30
ii. Opening in Shoulder	$15
iii. Opening outside Pavement & Shoulder	$10

Type of work Permit	Fees
iv. If Opening Occupies Two or More Areas Simultaneously Charge Only Higher Fee	
Aboveground Facilities	
a. Poles, Guys/or Anchors Installed Independently - Up To 10 Physically Connected Facilities	$20
b. Additional Connected Facilities (each)	$2
Crossings (tipples, conveyors, walkways, etc.)	$80
Seismograph – Vibroseismic method	
i. First Mile	$50
ii. Each Additional Mile or Fraction Thereof	$5
Non-Emergency Test Holes in Pavement or Shoulder (each hole)	$5
Other	$20

PennDOT will charge a supplemental fee of $10 for the time extension and $10 when the permittee proposes to make a change to a permit. The additional charges will be calculated either on an actual cost basis or a standard unit cost basis (PennDOT, 2018 and Highway Occupancy Permit Operations Manual, 2018). Pennsylvania Code Title 67 mentioned that the permit application fees and general permit inspection fees are not required from the Commonwealth, governmental authorities, and federal government.

Rhode Island

State of Rhode Island General Laws Title 39 authorizes public utility companies and wireless service providers to use and access the public highway rights-of-way, including freeway right-of-way, after obtaining permits from the Rhode Island Department of Transportation (RIDOT). The longitudinal installation of utility facilities within a freeway right-of-way are permitted only when there is no feasible in other location. Rhode Island Code of Regulations Title 290 and Title 39 allow RIDOT to charge for communications facilities use the rights-of-way. Still, the state does not mention any fees structure in their current policy to implement such fees except the fees of collocation of small wireless facilities. The fees charged should by the RIDOT must be reasonable and associated with the direct and actual costs and based upon the fair market value of the property utilized. The annual fees of collocation of small wireless do not exceed $150 annually or the rate produced by applying the formula adopted by the Federal Communications Commission for telecommunications attachments under 47 U.S.C. §224(e). No duration limit in permits regarding the collocation of small wireless facilities and such fees can be waved to government, municipalities, and non-profit entities.

South Carolina

South Carolina Code of Laws Title 57 and South Carolina DOT in their Utilities Accommodations Manual (2020) stated that any new installation or maintenance of utility facilities within public right-of-

way requires an encroachment permit from SCDOT. The utility companies and telecommunications providers must repair any damage to SCDOT property. Title 58 gives the municipality authority to manage their public rights-of-way on a competitively neutral and nondiscriminatory basis. It can charge a fair and reasonable franchise or consent fee on a telecommunications company to use the public streets and public property. The annual fees do not exceed the sum outlined in the following schedule based on population:

- $100 for population between 1-1,000 (Tier I)
- $200 for population between 1,001-3,000 (Tier II)
- $300 for population between 3,001-5,000 (Tier III)
- $500 for population between 5,001-10,000 (Tier IV)
- $750 for population between 10,001-25,000 (Tier V)
- $1,000 for population Over 25,000 (Tier VI)

This franchise fee is in lieu of any permit fee or other fee assessed on a telecommunications provider for its occupation of public-right-of-way (SC Code § 58-9-2230). The SCDOT Utilities Accommodations Manual does not provide any details about utility permit fees or any compensation to use the rights-of-way except as mentioned by Title 58 for telecommunications company franchise fees.

South Dakota

South Dakota Codified Laws-Title 49 requires any utility company, telecommunications provider, or governmental agency to obtain a permit before undertakes any utility work within the public rights-of-way. All longitudinal installations within the interstate right-of-way are prohibited except for fiber-optic telecommunications that are located as near the right-of-way line as practicable (South Dakota Administrative Rules - 70:04). However, the South Dakota Department of Transportation (SDDOT) may approve longitudinal installations or longitudinal utility attachments to structures under special cases. South Dakota Laws – Title 49 address the permit fees for utility crossing a railroad right-of-way, other than public right-of-way. The utility companies only pay a one-time standard crossing fee of $750 for each crossing. The utility company shall also reimburse the railroad for any reasonable and necessary flagging expense associated with a crossing, in addition to the standard crossing fee. No crossing fee is required if the crossing is located within a public right-of-way.

Tennessee

Tennessee Code Title 54 and the Utility Manual (2019) of the Tennessee Department of Transportation (TDOT) authorized utility companies to use and occupy their facility within the rights-of-way after obtaining the proper permit. Also, wireless communication facility may install their facility within the rights-of-way. According to the TDOT Utility Manual (2019), there are three types of permits application: individual, general agreement, and private license permit application. The individual general agreement permit applications are issued to the utility agency providing utility services to the public. In contrast, a private license permit application is issued for an individual or company that does not provide utility services to the public. Also, there are special non-exclusive permits that include fiber optic installations on freeways or control access facilities (Tennessee Code Title 54).

Tennessee Code Title §13-24-407 illustrates the charging fees to an applicant by a local authority to deploy small wireless facilities using the rights-of-way. The maximum fees and rates charged are $100 per small wireless facility for the first five small wireless facilities and $50 for additional small wireless facilities included in a single application. The legislation authorizes the Tennessee Department of Transportation (TDOT) to charge an additional application fee of $200 on the first application to cover the initial costs, then at each five-year must increase by 10%. The maximum annual rate for a small wireless facility colocation on a local authority-owned structure does not exceed $100 annually.

Tennessee Code Title 54 allowing the longitudinal installation of underground fiber optic cable lines within the rights-of-way of freeways on the state and federal interstate highway system. The TDOT has the authority to require a one-time payment of fair and reasonable compensation for the use of the right-of-way (Tennessee Code – Title 54). The application fees of use and occupancy agreement for fiber optic cable facilities on freeways is a $200 base fee and an additional $10 per mile of installation in all areas (Urban, Suburban, Rural) (Rules and Regulations of the State of Tennessee - 1680 – Transportation 1680-6-1-.09). Table D.26 and Table D.27 show the fiber optic compensation for access to controlled-access highway right-of-way and the valuation method of in-kind compensation. The fees are divided according to the location used by the telecommunication company. In urban areas, the application fees are $1,500 per mile per year per cable, and $1,000 per mile in suburban areas, and $500 per mile in rural areas for access to freeway right-of-way.

Table D.28 Tennessee Rate Sheet of Underground Fiber Optic Facilities – (Rules and Regulations of the State of Tennessee 1680-6-1-.09)

Minimum Underlying Urban/Suburban/Rural Rates	
Type of Right-of-Way	Annual Per Mile Rate
Urban	$1,500 per 11/4 inch innerduct (or equivalent)
Suburban	$1,000 per 11/4 inch innerduct (or equivalent)
Rural	$500 per 11/4 inch innerduct (or equivalent)
Minimum Underlying Clear Zone Rate	
Type of Right-of-Way	Annual Per Mile Surcharge
All Areas	$4,000, per trench

Table D.27 shows the valuation of in-kind compensation of fiber optic according to the term of the agreement. The rate was developed from Table 34, plus a 3% inflation factor for the annual remittance option or up-front remittance options, based on a 5% discount rate.

Table D.29 Tennessee Valuation of In-kind Compensation of Underground Fiber Optic Facilities by Years Term – (Rules and Regulations of the State of Tennessee 1680-6-1-.09)

Up-front verses Annual Remittance Options Per 11/4 inch innerduct (or equivalent), per mile					
Type of ROW	Annual	Up-front for a 10-year term	Up-front for a 20-year term	Up-front for a 30-year term	Up-front for a 40-year term
Urban	$1,500 + 3% inflation factor compounded (starting yr. two)	$12,162	$19,628	$24,212	$27,026
Suburban	$1,000 + 3% inflation factor compounded (starting yr. two)	$8,108	$13,085	$16,141	$18,017
Rural	$500 + 3% inflation factor compounded (starting yr. two)	$4,054	$6,543	$8,071	$9,009
Clear Zone (per trench)	$4,000 + 3% inflation factor compounded (starting yr. two)	$32,431	$52,341	$64,564	$72,068

There is an annual increase of the per-mile rates listed in Table D.27 by the actual percentage rate of inflation as measured by the Consumer Price Index (CPI). Tennessee Department of Transportation (TDOT), at its option, may accept monetary compensation or in-kind compensation, or both for the use of freeway rights-of-way to install fiber optic cable facilities in accordance with the rate of compensation calculated in Tables D.26 and D.27. Suppose the TDOT chooses to receive in-kind compensation. In that case, it shall provide the telecommunications company with a list of the specific telecommunications facilities and services it wishes to obtain according to the value as determined in Tables 3.35 and 3.36. The compensation rate varies according to the location of state freeway right-of-way (urban, suburban or rural) in which the fiber optic cable facilities are located (Rules and Regulations of the State of Tennessee 1680-6-1-.09).

Texas

Texas Statutes and Texas Administrative Code (TAC) Title 43 gives the public utility the right to operate and install their facilities within the public highways rights-of-way after obtaining the proper permit from the Texas Department of Transportation (TxDOT). Private utilities also are allowed to install their facilities over, under, or across a highway under specific circumstances, but it is prohibited to place a utility facility longitudinally on a highway right-of-way. The Transportation Code, Section 202.052 also authorizes TxDOT to execute a lease with private utilities to place their facilities on facilities owned by the State. The Statutes for the compensation from telecommunications providers using the rights-of-way mentioned municipalities only, and there is no mention of the TxDOT to regulate or set fees.

Texas, generate revenue from the telecommunications installations on controlled-access rights-of-way or from pole attachment throughout the municipalities either by cash, services, in-kind compensation, or resource sharing (Texas Statutes Sec. 54.204). This compensation must be fair and reasonable for using a public right-of-way within the municipality (Texas Statutes Sec. 283.001). Kraus, et al, (2020) mentioned that Texas generates revenue from macrocell towers and accommodates private communications lines longitudinally on state rights-of-way. TxDOT allows wireless communications providers to use available

space on existing TxDOT towers and install macrocell towers on surplus property. The TxDOT charging varies annual lease fees from wireless communications providers by using appraisals or a rate schedule comparison.

Texas Statutes from Section 284.053 to Section 284.156 illustrate the annual rate of use public right-of-way by the network provider. The rate amount of right-of-way use vary according to the type of use as follows:

- Maximum $250 annually multiplied by the number of network nodes installed in the public right-of-way in the municipality's corporate boundaries. (This amount can be adjusted annually by an amount equal to one-half the annual change, if any, in the consumer price index).
- $28 monthly multiplied by the number of the network if a network provider needs to connect a network node to exciting network.
- Maximum $20 per year per service pole for collocation of network nodes on service poles.
- $500 annually per application covering up to five network nodes
- $250 annually for each additional network node per application and $1,000 annually per application for each pole.

Texas Statutes Section 283 determine the base amount that telecommunications providers will pay as compensation for using the public rights-of-way in the municipality boundaries. Section 283.053 defines the "Base Amount" as "*is the total amount of revenue received by the municipality in franchise, license, permit, and application fees and in-kind services or facilities from certificated telecommunications providers in 1998 within the boundaries of the municipality, including all newly annexed areas.*" To determining the base amount, in-kind services or facilities provided to municipalities under existing franchise agreements by telecommunications providers should be valued at 1% of the total 1998 revenue from the franchise, permit, license, and application fees paid to the municipality under all applicable telecommunications franchise agreements or ordinances. The base amount is varied according to the location (Texas Statutes Section 283.053); for example, the base amount paid by telecommunications providers for a municipality located in a county with a population of less than 25,000 should be as follow:

- *An amount not greater than the statewide average fee per line for each category of access line of the certificated telecommunications provider with the greatest number of access lines in that municipality, multiplied by the total number of access lines in each category located within the boundaries of the municipality on December 31, 1998, for a municipality in existence on that date, or on the date of incorporation for a municipality incorporated after that date*
- *An amount not greater than the base amount determined for a similarly sized municipality in the same or an adjacent county in which the certificated telecommunications provider with the greatest number of access lines in the municipality is the same for each municipality; or*
- *The total amount of revenue received by the municipality in franchise, license, permit, and application fees from all certificated telecommunications providers in 1998."*

Utah

Utah Administrative Code R907, Utah Code Title 54, and Title 72 give the public utility and communication providers the right to use and install their facilities within the public highways rights-of-way after obtaining an encroachment permit from the Utah Department of Transportation (UDOT). All utilities are required to have a license prior to installing in ROW. When the highway ROW crosses federal lands (BOR, BLM, Native American, etc.) or private ROW (e.g., railroads) by an easement, additional permits and approvals are required. The utility must certify they are following applicable City/County regulations (environmental); the STA does not police it. Regarding bridge structure attachment, the structure attachments are not allowed except in extenuating circumstances. When permitted, an agreement is executed defining cost responsibilities/liabilities. In 2018 the Utah legislature was passed Small Wireless Facilities (SWF) Deployment Act. This new law authorizes telecommunications companies to obtain permits and is required to enter into a non-exclusive occupancy agreement to install SWF in the UDOT right-of-way. Private utilities may (at UDOTs decision) be installed across the ROW but not longitudinally or attached to bridges (Utah Administrative Code R930-7). While Utah Administrative Code R907-64-2 and subsection 72-7-108(2) (a) UDOT may allow a telecommunication facility provider longitudinal access to the right-of-way of a highway on the interstate system for the installation, operation, and maintenance of a telecommunication facility under certain conditions.

In addition, utility companies are required to submit a continuous liability bond of $100,000 per occurrence naming UDOT as the insured. This bond is required until the facilities are removed from the ROW (Utah Administrative Code R930-7). Continuous Bond requirements are the same. The basis is cost recovery to the STA in the event the utility damages the roadway or negatively impacts the public. Companies do not want a bond default on their record and are incentivized to correct damages to the STA's satisfaction in a timely way (Utah Administrative Code R930-7). Under certain conditions, political subdivisions and small canal companies may be exempted from the continuous $100,000 bond requirement. STA may waive permit fees for municipalities under a reciprocal agreement (Utah Administrative Code R930-7).

The UDOT requires a general utility accommodation permit fee; the fee basis is a recovery of DOT costs and encourages reduced impact on the public. Table D.28 illustrate the utility encroachment permit fees. A point system is used to determine the permit fee (4 levels). Points are assigned based on ADT, impact to the road (less than 20%, 20 to 50%, over 50%), the linear footage of installation, impact to the pavement (cut vs. bored/jacked), or aerial (crossing or parallel to the road), duration of construction, and roadway classification. In addition, inspection fees may be charged at set rates ($60/hr. business hours, $80/hr. after hours, and overtime). The utility encroachment permits arrange from $135 to $500 per permit, and the manhole access permit is $30 (UDOT, 2015 Encroachment Permits, 2015).

Table D.30 Utah Utility Encroachment Permit Fees (UDOT, 2015 Encroachment Permits, 2015)

Point Value Table			
Activity	**Points**	**Maximum Permit Time**	**Permit Fee**
8001	No construction impact	1 week	$30
7P01	1 hour thru 7 hours	1 week	$135
7P02	8 hours thru 11 hours	2 weeks	$300
7P03	12 hours thru 15 hours	4 weeks	$500
Aerial Cable Installation			
Road Classification		**Road Impact**	**Permit Fee**
Minor		Roads Minor Crossing	$30
Principle Arterial / Freeway		Major Crossing	$135
All Roads		Pole Line	Minimum $135
Hourly Inspection Fees			
Normal Business Hours		$60 an Hour	
After Hours and Overtime		$80 an Hour	
Access Review Fees (Access Violations Fees are $100 Per Day)			
Type 1		$75	
Type 2		$475	
Type 3		$1000	
Type 4		$2,300	

Utah Code - Title 54-21-502 sets the rates fees of right-of-way used by small wireless facilities. The rate for the right to use or occupy a right-of-way should be (1) fair and reasonable; (2) competitively neutral; (3) nondiscriminatory; (4) direct to the actual use of the right-of-way; and (5) not more than the greater of 3.5% of all gross revenue related to the wireless provider's use of the right-of-way for small wireless facilities or $250 annually for each small wireless facility. The small wireless facility permits fees and rates as shown as follow:

- $100 Non-refundable application review fee for each SWF collocated on an existing or replacement utility pole.
- $250 Non-refundable application review fee (if permitted use) to install, modify or replace a utility pole associated with an SWF.
- $1,000 Non-refundable application review fee (if non-permitted use) to install, modify or replace a utility pole associated with an SWF (Title 54-21-503).

- $250 annually for each SWF for the right to use or occupy the right-of-way.
- $50 annually for each SWF collocated on UDOT's approved utility poles.

Title 54-23-105 address the permit fees for utility crossing a railroad right-of-way, other than public right-of-way. The fiber optic carrier only pays a one-time standard crossing fee of $1,250 for each crossing. The crossing fee is in lieu of any other fees, licenses, or charges to reimburse the railroad for the direct expenses except the flagging expense associated with a crossing. The fiber optic carrier shall also reimburse the railroad for any reasonable and necessary flagging expense associated with a crossing, in addition to the standard crossing fee.

Utah Code Title 72-7-108 authorizes UDOT to enter into a compensation agreement with a telecommunication facility provider for longitudinal telecommunication access in the highway's right-of-way on the interstate system. As a basis for generating revenue, the compensation charged may be cash, in-kind compensation, or in a combination of cash and in-kind compensation. In-kind compensation may include uses conduit, innerduct, dark fiber, access points, telecommunications services, bandwidth, and other telecommunications facilities. The payment can be one lump sum determined according to this Rule R907-65-12 or to pay in annual installments. The compensation charged should be: (1) fair and reasonable; (2) competitively neutral; (3) nondiscriminatory; (4) open to public inspection; and (5) Determined based on the geographic region considering the population and the impact on private right-of-way users. Also, UDOT allows telecom providers to install fiber facilities on controlled access right-of-way in exchange for the use of fiber resources owned by the provider or trading the use of UDOT owned fiber strands in exchange for the use of strands owned by a telecom provider. The rights-of-way value is determined by UDOT based on the fair market value or rent of highway ROW on a per-mile basis. The Utah DOT calculated the fair market value or rent of a highway right-of-way per mile (Title 72-7-108).

UDOT conducted an analysis of right-of-way values for the interstate system using current market data on: (1) Utah real property values differentiated by location, population density (urban, rural) and land use and (2) appraisal values from department land acquisitions as the following core assumptions (Utah Administrative Code R907-65-3):

- *Land needed for longitudinal installations of telecommunications facilities, including a buffer zone, will generally be 6 feet in width.*
- *Values for preassembled right-of-way for longitudinal access are 200% of values for non-assembled right-of-way.*
- *Values for underground use of the right-of-way for longitudinal access are 50% of ground level and aboveground use-values.*

Point estimates of segment land values are calculated using the following formula:

Segment land value ($/mile) = Segment land value ($/ft2) x 5,280 ft/mile x easement width (6 ft).

The segments were then grouped into five zones based on similarities in segment attributes and values to determining land values. The existing right-of-way of the interstate system is placed into the five zones, and the land value for such zones is set forth in Table D.29. The five zones of the State are to determining land values and compensation rates for longitudinal access to the right-of-way of the interstate system (Utah Administrative Code R907-65-6).

Table D.31 Utah Land Values ($/mile) – (Utah Administrative Code R907-65-6)

Zone	Miles in Zone	Weighted Average Land Value
Zone 1	575	$8,000
Zone 2	212	$22,000
Zone 3	50	$48,000
Zone 4	60	$80,000
Zone 5	47	$124,000

The UDOT determined annual lease valuation as a rate of return on the land values for each zone. The UDOT determined that a 10% annual rate of return on investment represents a fair and reasonable compensation rate in current market conditions. The Utah DOT shall conduct a market analysis to determine the fair and reasonable values of the right-of-way of the interstate system for longitudinal access for telecommunications facilities every five years (Utah Administrative Code R907-65-6). The UDOT authorize to charge compensation for longitudinal access for telecommunications facilities on an annual basis. The annual compensation to be paid by each telecommunications facility provider for longitudinal access shall be determined under the following formulas (Utah Administrative Code R907-65-8):

- Land values by zone:

$$Annual\ compensation\ rate\ per\ zone\ (\$/mile) = zonal\ land\ value\ (\$\ per\ mile)\ (from\ Table\ 37)\ x\ rate\ of\ return\ (currently\ 10\%)$$

Total annual compensation shall then be calculated as follows:

$$Total\ annual\ compensation\ per\ zone = annual\ compensation\ rate\ per\ zone\ (\$\ per\ mile)\ x\ Number\ of\ miles\ accessed.$$

Utah DOT uses an online system called the Utah Geospatial Resource Center (UGRC) to manage revenue and resource sharing from telecom providers (https://gis.utah.gov/data/). The system provides information of all broadband projects, DOT route locations, location, and ROW information that telecommunications providers can use.

Vermont

In their Utility Accommodation Plan, Vermont Statutes Title 19 and The Vermont Agency of Transportation (VTrans) (2016) authorized utility companies, broadband, and telecommunications providers to construct their facilities within the highway rights-of-way after applying for and obtaining a permit from VTrans. Utility Accommodation Plan (2016) and Right of Way Manual (2018) address the fees of installing and maintaining the wireless facilities within the rights-of-way without a clear amount for these facilities. VTrans follow section 253 of the Federal Telecommunications Act of 1996 regarding compensation rates. The charging fees by VTrans must be fair and reasonable compensation. The compensation for longitudinal accommodation for the wireless facilities in freeway right-of-way varies according to the equipment, geographic location, and factors specific to each access agreement. VTrans also charge compensation for the installation of renewable energy facilities and may also receive in-kind energy supplies or other services, subject to negotiation.

Installation of utility facilities is governed by state law. VTrans in their State Highway Access and Work Permit - Fee Schedule (2016), mentioned that municipal, state projects, nonprofit organizations, and companies are not exempt from work permit fees. The work permit fee is a onetime fee as follow:

- $100 for utility installations
- $250 for minor commercial developments
- $2,500 for major commercial developments
- $500 for annual utility permits

Virginia

The Code of Virginia Title 56 and 20 authorized utility companies and telecommunications providers to install their facilities within the state highway rights-of-way after obtaining a proper permit from the Virginia Department of Transportation (VDOT). The Virginia DOT prohibited utilities to install their facility longitudinal on interstates. However, VDOT allows longitudinal installations in controlled-access rights-of-way only if the utility cannot be accommodated otherwise and with exception via resource sharing. There are two types of utility permits to authorize utility installations depending on the type and duration of the activity, single-use permits and district-wide permits. Single-use permits are required for utility installations within limited access highways and primary and secondary road rights-of-way at a specific location. In contrast, district-wide permits are required for multiple occurrences of the same activity on non-limited access, primary, and secondary ROW with two years duration.

Virginia legislation prohibits VDOT from charging an annual use fee from companies regulated by the State Corporation Commission to use the public right-of-way. These utilities are (1) cable television operators according to the Code of Virginia §15.2-2108.1:1, and §56-468.1, (2) providers of telecommunications service also shall not be charged land use permit application and additive fees or an annual payment under a resource-sharing agreement (Code of Virginia § 56-468.1) and (3) municipal or authority-owned sewer, and water facilities and renewable energy generation transmission facilities shall not be charged an accommodation (24VAC30-151-730). Also, the Code of Virginia Title §56-484.27 prohibits the locality or the VDOT from requiring in-kind compensation or physical assets from the wireless services provider or wireless infrastructure provider as a condition of consent to use public rights-of-way or easements to install small wireless facilities. If a company is not registered with the State Corporation Commission, then the single-use and district-wide permit fees would apply to the installations. Virginia Administrative Code Title 24VAC30-151-710 and VDOT Land Use Permit (LUP) illustrate the permit fees as shown in Table D.30.

Table D.32 Virginia DOT Utility installation Permit fees

Permit	Fees
Single-use permit	
Land use permit for processing the request (single-use permit). Onetime - nonrefundable	$100
The single-use permit fee for surveying operations	$100
Additive costs shall be applied as indicated below	
▪ Storm Sewer	$10 per 100 linear feet
▪ Box Culvert or Bridge	$5 per linear foot of attachment
▪ Drop Inlet	$10 per inlet
▪ Above-ground Structure (including poles, pedestals, fire hydrants, towers, etc.)	$10 per structure
▪ Pole Attachment	$10 per structure
▪ Span Guy	$10 per crossing
▪ Additive Guy and Anchor	$10 per guy and anchor
▪ Underground Utility – Parallel	$10 per 100 linear feet
▪ Overhead or Underground Crossing	$10 per crossing
▪ Excavation Charge (including Test Bores and Emergency Opening)	$10 per opening
District-wide permits	
District-wide permit for surveying operations on non-limited access (for a period of two (2) years)	$200 per district
District-wide permit for placement of construction equipment and related work zone traffic control on state-maintained highway right-of-way associated with the installation and maintenance of utility facilities located off the highway ROW (for a period of one (1) year)	$400 per district
District-wide permits for the installation and maintenance of end user utility service connections (for a period of two (2) years).	$750 per district
Miscellaneous permit fees	
To connect the facility to the transmission grid pipeline - Nonutility renewable energy facility that produces not more than two megawatts and not more than 5,000 mm BTUs/hour	$1,500 per mile

Virginia DOT generates revenue from the wireless support structures and from accommodating longitudinal communications installations on controlled-access rights-of-way. As a basis for generating revenue, the compensation for using the limited access right-of-way may be cash, mutually agreeable exchange of goods or services only, or in a combination of both (Code of Virginia Title 24). As we

mentioned, VDOT doesn't charge any fee for using the right-of-way on a wireless services provider to attach or co-locate small cell facilities on an existing structure in the right-of-way. However, VDOT charges a reasonable fee not to exceed $750 for processing an application for a district-wide permit or $150 for processing an application for a single-use permit (Code of Virginia §56-484.28). VDOT also charges an annual use fee of $250 per mile for longitudinal communications lines in limited access rights-of-way. The fee for telecommunication lines crossing limited access rights-of-way is $50 per crossing (Virginia Administrative Code Title 24VAC30-151-730). The VDOT also charges a collocation fee for macrocell installations located in all types of right-of-way. Land Use Permit (LUP), Virginia Administrative Code Title 24VAC30-151-730 and Code of Virginia §56-484.32 Illustrate the fees structure of Wireless Support Structure using right-of-way as shown in Table D.31. The fee amount is adjusted every five years. VDOT charges fees from wireless support installed under a land-use permit issued prior to July 1, 2018, or after that date. Code of Virginia §56-484.31 mentioned that all charging rates for the telecommunications facilities within VDOT right-of-way must be a competitively neutral just and reasonable, cost-based, nondiscriminatory basis as well as comply with all applicable state and federal laws.

Table D.33 Virginia Wireless Support Structure Fee Structure

Permit	**Fee**
Installation and maintenance of small cell facilities on existing structures	
Single-use permit	$150
District-wide permit	$750 per district
Processing a permit application	$250
The co-location of a wireless facility on an existing wireless support structure on highway right-of-way	
Land use permit application for processing the request.	$110
Wireless support structure at or below 50 feet in height	$500
Wireless support structure above 50 feet and at or below 120 feet in height	$1,500
Wireless support structure above 120 feet in height	$2,500
A wireless support structure installed under a land-use permit issued prior to July 1, 2018	
Annual use payment for a wireless support structure permitted prior to July 1, 2018, until the permit expires or is terminated	$24,000
Annual use payment for non-small-cell colocation on a wireless support structure	$14,000
A wireless support structure installed under a land-use permit issued on or after July 1, 2018 (Annually)	
land use permit application for processing the request	$100
Wireless support structure at or below 50 feet in height with a small cell installation	$270
Any other wireless support structure at or below 50 feet in height	$1,000
Wireless support structure above 50 feet and at or below 120 feet in height	$3,000

Permit	Fee
Wireless support structure above 120 feet in height	$5,000
Any other equipment, shelter, or associated facilities constructed on the ground	$1.00 per square foot

Virginia uses a formula to determine fees charged to a wireless provider providing telecommunication services and using the rights-of-way. Code of Virginia Title §56-468.1 mentioned that the public ROW use fee is imposed on customers of telecommunications companies and cable operators that use the public rights-of-way. All counties and localities that collect the Right of Way Use Fee cannot charge any other fee to certificated telecommunication providers such as permit fees, inspection fees, and franchises. Code of Virginia Title §56-468.1 mentioned that the Public Rights-of-Way Use Fee should be charged on a per-access line basis for any local telecommunications service provider and on a per-subscriber basis by adding the fee to each ultimate end user's monthly bill for the cable operator. Any company providing local telecommunications and cable services to the same ultimate end user should collect only one Public Rights-of-Way Use Fee. The annual Public Right of Way fee with a minimum of $.50 per access line per month is added to an end user's monthly bill. VDOT calculates the new rate to be charged annually based on the following formula.

The annual rate of the Public Rights-of-Way Use Fee shall be calculated by multiplying the number of public highway miles in the Commonwealth by a highway mileage rate and by adding the number of feet of new installations in the Commonwealth (multiplied by $1 per foot) and dividing this sum by the total number of access lines in the Commonwealth. The purpose of these charges is to recover the increased maintenance and construction costs resulting from the utilities' presence in or along the roadways (Code of Virginia Title §56-468.1). The amount of the Public Rights-of-Way use fee is calculated annually by the Virginia DOT using the following formula:

$$Annual\ Use\ Fee\ Rate = \frac{(n * r + i * x)}{a}$$

n = number of public highway miles in the commonwealth of Virginia

r = highway mileage rate in $ per mile

i = number of new installations in the Commonwealth of Virginia in feet

x = new installation rate of $1.00 per foot

a = number of access lines in the Commonwealth

The Annual Use Fee Rate is recalculated annually by the above formula. VDOT set the highway mileage rate at $425 per year per mile beginning July 1, 2001, and thereafter. For example, based on calculations by VDOT on their Right of Way Use Fee Information. (January 2021), the Annual Use Fee Rate for 2021 is $19.18, which is equivalent to a monthly right-of-way use fee of $1.60 per access line, for the period of July 1, 2021, to June 30, 2022. The fee was calculated using the following values:

Mileage of Highway System

- Primary = 8,027.85 miles

- Secondary = 49,644.76 miles
- Urban = 11,775.31 miles
- Frontage Roads = 314.24 miles
- Arlington = 403.76 miles
- Henrico = 1385.64 miles

(n) Total number of public highway miles in the commonwealth of Virginia = 71,551.56 miles

(r) Highway mileage rate in $ per mile = $425

(i) Number of feet of new installations within public rights of way between October 1, 2019, and September 30, 2020, by certificated providers of telecommunications services = 5,427,866

(x) New installation rate = $1.00 per foot

(a) Number of access lines as of September 30, 2020, reported by certificated providers of telecommunication services: = 1,868,108

$$Annual\ Use\ Fee\ Rate = \frac{(n * r + i * x)}{a}$$

$$Annual\ Use\ Fee\ Rate = \frac{(71{,}551.56 * \$425 + 5{,}427{,}866 * \$1.00)}{1{,}868{,}108} = \$19.18$$

So, for July 1, 2021 – June 30, 2022, the monthly Right of Way Use Fee is $19.18 ÷ 12 = $1.60

Washington

Revised Code of Washington (RCW) and Washington Administrative Code (WAC) authorized public utilities and telecommunications providers to construct and collocate their facilities within the rights-of-way after obtaining a permit from the Washington Department of Transportation (WSDOT). Washington Administrative Code (WAC) Title 480 Section 480-54-060 prohibited any fee from a telecommunications company to use its right-of-way other than a fair and reasonable fee to cover the administrative costs. The non-highway rights-of-way use must be charged fair market value, so the state attempts to determine the value and recovers that cost.

Washington Administrative Code (WAC) Title 468-34-020, Title 47.50.050, and WSDOT in their Utilities Manual (2019) set a rule of accommodation fees for various types of installation. The utility installation categories are defined by the effect of the installation on the highway integrity and impact on the traveling public. The applications fee for the utility installation on the highway right-of-way is shown as below:

- $500 for category 1 installation (Considerable Impact)
- $300 for category 2 installation (Limited Impact)
- $150 for category 3 installation (Little or No Impact)
- No fee for category 4 installation (Exempt Same-Side Service Connection)
- $300 for franchise consolidation

- $250 for franchise renewal
- $50 for franchise assignment or transfer of ownership

The above fee is non-refundable fees and only covers the basic overhead charges related to the processing of accommodation applications. WSDOT also set fees to review the structural analyses of the wireless facility such as tower and monopole. The applications fees refer to the tower and monopole located on: WSDOT owned right of way, WSDOT radio site, and WSDOT-owned structure. The direct administrative expenses are between $3,500 to $7,500, depending on the complexity of the review (Wireless Communications Leasing - WSDOT Wireless Lease Process/Fee Schedule, 2015).

To receive benefits and meet the federal "fair market value" requirement, Washington DOT receives a type of rent or requires in-kind services from a telecommunications company as a condition of the use of the public right-of-way. Kraus, et al, (2020), in their report, mentioned that to determine fair market value and receive benefit from a tower installed in the right-of-way, WSDOT calculated the fair market value by considering (1) location, (2) amount of traffic in that location, (3) value of the property and (5) how much equipment is going to be installed in the tower. Washington Administrative Code (WAC) Title 480-54-060 used two formulas to determine the fair market value. Formula number 1 used to determine a fair, just, reasonable, and sufficient rate shall apply to attachments to poles. While formula number 2 used to determine a fair, just, reasonable, and sufficient rate shall apply to attachments to ducts or conduits.

Formula number 1: (attachments to poles)

*Maximum Rate = Space Factor * Net Cost of a Bare Pole * Carrying Charge Rate*

Where: *Space Factor = Occupied Space / Total Usable Space*

Formula number 2: (attachments to ducts or conduits)

Maximum Rate per Linear ft./m. = [(1/ Number of Ducts) x (1 Duct/Number of Inner Ducts)] x [Number of Ducts x (Net Conduit Investment/System Duct Length (ft./m.))] x Carrying Charge Rate

(Percentage of Conduit Capacity) *(Net Linear Cost of a Conduit)*

$$\textit{Maximum Rate per Linear ft./m.} = \left[\frac{1}{\text{Number of Ducts}} \times \frac{1\ \text{Duct}}{\text{Number of Inner Ducts}}\right] \times \left[\frac{\text{Number of Ducts}}{\text{System Duct Length (ft./m.)}} \times \frac{\text{Net Conduit Investment}}{\text{System Duct Length (ft./m.)}}\right] \times \textit{Carrying Charge Rate}$$

(Percentage of Conduit Capacity) (Net Linear Cost of a Conduit)

Simplified as:

Maximum Rate per Linear ft./m. = [1 Duct/No. of Inner Ducts] x [Net Conduit Investment / System Duct Length (ft./m.)] x Carrying Charge Rate

$$\text{Maximum Rate per Linear ft./m.} = \left[\frac{\text{1 Duct}}{\text{No. of Inner Ducts}}\right] \times \left[\frac{\text{Net Conduit Investment}}{\text{System Duct Length (ft./m.)}}\right] \times \text{Carrying Charge Rate}$$

If no inner duct or only a single inner duct is installed, the fraction "1 Duct divided by the Number of Inner Ducts" is presumed to be 1/2.

West Virginia

West Virginia Code of State Rules Title 157 and West Virginia Code Chapter 31H authorizes publicly and privately owned utilities, including communication providers, to use and occupy the state highway right-of-way to install and collocate their facilities on the right-of-way after obtaining utility permit. West Virginia Department of Transportation (WVDOT) allows fiber optic cable to be run longitudinally in the controlled access ROW. Also, telecommunications providers are required to provide compensation to the WVDOT for costs incurred as a result of use, collocate, and occupancy of the right-of-way (Accommodation of Utilities on Highway Right of Way and Adjustment and Relocation of Utility Facilities on Highway Projects, 2007). West Virginia in their "Dig Once" Interim Final Guidance (2020), also addressing telecommunications facilities installation and compensation in the ROW. In terms of defining the amount of compensation, the Legislature has set the monetary fair market value at zero dollars ($0) but provided for in-kind compensation. In-kind compensation paid to the WVDOT under an agreement may include (1) Innerduct; (2) Dark fiber; (3) Conduit or excess conduit; (4) Access points; (5) Telecommunications equipment or services; (6) Bandwidth; and (7) Other telecommunications facilities as a component of the present value of the trenching (West Virginia Code Chapter §17-2E-6). In-kind compensation due from a telecommunications carrier should be: (1) At Fair Market Value; (2) Competitively Neutral; (3) Nondiscriminatory; (4) Open to Public Inspection; (5) Determined based on the geographic region taking into account the population and the impact on private right-of-way users; and (6) Paid with in-kind compensation (West Virginia Code Chapter §17-2E-3). Kraus, et al, (2020) mentioned that West Virginia DOT uses appraisals to determine fair market value.

West Virginia Code Chapter 31H and Code of State Rules Title 157 set permit fees and rates structure for small wireless facilities to use and occupy the state highway right-of-way as follow:

- Not exceed $25 per year per small wireless facility for occupancy and use of the right-of-way, and this rate is adjusted every five years by 10% (§31H-2-1).
- $65 per year per pole for collocate small wireless facilities on an authority utility pole, and this rate is adjusted every five years by 10% (§31H-2-3 and §157-13-4).
- Not exceed $200 each for the first five small wireless facilities in the same application and $100 for each additional small wireless facility in the same application for collocation of small wireless facilities on an existing utility pole and this rate adjusted every five years by 10% (§31H-2-3 and §157-13-4).
- Not exceed $250 for the application fee for the installation, modification, or replacement of a utility pole and the collocation of an associated small wireless facility that is a

permitted use in accordance with the specifications and this rate adjusted every five years by 10% (§31H-2-3 and §157-13-4).

- Not exceed $1,000 for the application fee for the installation, modification, or replacement of a utility pole and the collocation of an associated small wireless facility that is not a permitted use in accordance with the specifications and this rate adjusted every five years by 10% (§31H-2-3 and §157-13-4).

Wisconsin

Wisconsin Administrative Code and Wisconsin Statutes & Annotations Chapter 66 authorize publicly and privately owned utilities, including telecommunications carriers, to use and occupy the state trunk highway (STH) right-of-way to install and collocate their facilities after obtaining a utility permit from the Wisconsin Department of Transportation (WisDOT). Private utility facilities allow to cross state highways and to be run longitudinally in controlled-access highways under exceptions and will not impair the highway or interfere with the free and safe flow of traffic. Also, cellular towers, monopoles, macrocells, small wireless facilities allowed on highway ROW and controlled-access highways after obtaining the prober permits from WisDOT (Wisconsin Department of Transportation (WisDOT) Utility accommodation policy, 2020).

Under Statutes & Annotations Chapter 66.0414, 86.07(2)(a) and 84.01(31), WisDOT has the authority to charge fees or receive communication services in exchange or In-kind compensation for the use of highway ROW, which also includes rest areas, waysides, park-n-ride lots and other WisDOT-owned or controlled property. WisDOT set a rate fees schedule for the cellular facility as listed in Table D.32. The fees schedule includes two categories, the cellular site description and the highway category. The cellular site description addresses the types of cellular groups, and the highway category addresses the types of access of right-of-way. The fees rate is fixed for five years, then adjusted by 10%, and the Consumer Price Index (CPI) changes. WisDOT may enter into a shared resource agreement with a wireless provider to obtain tower space or communication services in lieu of charging fees.

Table D.34 Rate Schedule for Cellular Facility Use of Wisconsin DOT ROW (Utility Accommodation Policy, 2020)

Cellular Facility Description	Application Fee - non-refundable (Onetime)	Annual Site Rates	
		Not a controlled-access highway	Controlled-access highway
1. Lattice tower or tall monopole (with or without equipment compound)	$1,000	$6,000	$12,000
2. Macro cell	$1,000	$1,200	$2,400
3. Small wireless facility on a utility pole or third-party utility pole	$1,000	$20 times the total number of SWF in WisDOT ROW	
4. Small wireless facility on WisDOT utility pole	$500 5 or fewer small wireless facilities plus $100 for each small wireless facility more than 5	$250 per SWF	

As we mentioned, telecom providers allow locating fiber optic facilities longitudinally on the controlled-access highway right-of-way. Under Wisconsin Statutes & Annotations Chapter 66.0414, 86.07(2) (a), and 84.01(31), WisDOT has authority to require fees for the longitudinal occupation of controlled-access highway ROW includes interstates, freeways, and expressways. WisDOT does not charge a right-of-way fee for longitudinally occupying non-controlled access highways. Table D.33 lists the current fiber optic fees rates in controlled-access state trunk highways (STHs), including interstates, freeways, and expressways. All rates cover a 20-year period and apply to private utility installations on all STHs. In lieu of charging fees, WisDOT may enter into a shared resource agreement with a wireless provider to obtain dark fiber or communication services. Price, (2016) mentioned that WisDOT entered into many shared-resource agreements in lieu of a cash payment and received dark fiber in exchange for the longitudinal use of controlled access highway ROW.

Table D.35 Wisconsin Longitudinal ROW Occupancy Rates on Controlled-Access Highways

Broadband Infrastructure	**Controlled-Access Highways**		**Bridge Attachments3**	
	≤ 100,000 AADT1	**> 100,000 AADT**	**Interstate**	**Non-Interstate**
No fee on all highways and bridges	$10,000/mile	$12,000/mile	$25,000	$10,000
	Add 20% per duct per mile2		Add 20% per duct4	
Initial issuance of any permit per Wis. Stat. s. 86.16(6)	1) AADT = Annual Average Daily Traffic		3) Costs on unique bridges are below	
	2) Each duct over two		4) Each duct over six	
Highway	**From**	**To**	**Unique Bridge Cost – Description**	
I-39	IL state line	WIS 29(E), Wausau	$50,000 – All river bridges > 500 feet	
I-41	IL state line	I-43, Green Bay	$100,000 – Lake Butte des Morts	
I-43	I-90, Beloit	I-41, Green Bay	$250,000 – Frigo	
I-90	IL state line	MN state line (no bridge)	$50,000 – All river bridges > 500 feet	
I-94	IL state line	MN state line (includes bridge)	$50,000 – All river bridges > 500 feet	
I-535	Superior	Duluth	$500,000 – Blatnik	
I-794	I-43/94	WIS 794	$250,000 – Hoan	
I-894	I-94/US 45 (Zoo interchange)	I-43/94 (Mitchell interchange)		
US 10	I-41	CTH J, Stockton		
US 10	I-39/USH 51	WIS 13, Marshfield	$25,000 – Wisconsin River	
US 12	IL state line	WIS 67, Elkhorn		
US 12	CTH N, Cottage Grove	WIS 188	$25,000 – Yahara River	
US 14	WIS 138, Oregon	US 12/14, Middleton (University Ave)		
US 18	US 151, Dodgeville	CTH N, Cottage Grove		
US 41	I-94	Lloyd Road, Milwaukee		
US 41	US 45	Bus 41(E), Peshtigo		

Broadband Infrastructure	**Controlled-Access Highways**		**Bridge Attachments3**	
	≤ 100,000 AADT1	**> 100,000 AADT**	**Interstate**	**Non-Interstate**
US 45	I-94/894	CTH D, West Bend		
US 51	Larson Beach Rd, McFarland	US 151, Madison (E Washington Ave)		
US 51	CTH CV, Token Creek	Grinde Road, DeForest/Windsor		
US 51	WIS 29(E), Wausau	US 8	$25,000 – All river bridges > 500 feet	
US 53	I-90, La Crosse	CTH HD, Holmen		
US 53	I-94, Eau Claire	WIS 13, Superior	$25,000 – All river bridges > 500 feet	
US 141	US 41, Green Bay	WIS 64, Pound		
US 151	IA state line (no bridge)	US 14, Madison (Park St)		
US 151	Zeier Road, Madison	WIS 23, Fond du Lac		
WIS 16	I-94, Waukesha	CTH P, Oconomowoc		
WIS 23	I-43	CTH C, Plymouth		
WIS 26	I-39, Janesville	WIS 16-60	$25,000 – All Rock River bridges	
WIS 29	I-94	I-41, Green Bay	$25,000 – All river bridges > 500 feet	
WIS 57	I-43	WIS 42/CTH MM		
WIS 145	WIS 181	US 41/45		
WIS 172	I-43	I-41		
WIS 312	I-94	US 53	$25,000 – Chippewa River	
WIS 441	I-41(S)	I-41(N)	$100,000 – Little Lake Butte des Morts	

The fee structure is determined based on installation length, Annual Average Daily Traffic (AADT), and rate for bridge attachments. The higher traffic areas capture more revenue, which is assumed to be a more desirable location. The fees range from $10,000 to $12,000 per year per centerline mile of installed length for a 20-year period. The fees are prorated when the installation length is less than half of a mile. For bridge attachments, fees based on interstate or non-interstate can range from $10,000 to $500,000 depending on the river crossings and location.

Wisconsin Administrative Code Department of Transportation (Trans 29.07) set another permit fees schedule for utility crossing a railroad right-of-way, other than public right-of-way. The utility companies only pay a one-time standard crossing fee of $175 for each crossing (aerial or underground), and the utility company shall also reimburse the railroad for any reasonable and necessary flagging expense associated with a crossing, in addition to the standard crossing fee. The crossing fee is in lieu of any other fees, licenses, or charges to reimburse the railroad for the direct expenses except the expense of flagging associated with a crossing. Longitudinal aerial utility installation is divided into two main categories, aerial and underground, as shown in Table D.34. For the underground utility facility installations, the fee is based on one pre-construction inspection, and the utility owner will pay plus $50 for each daily inspection or follow-up inspection.

Table D.36 Wisconsin Longitudinal Utility Installation

Length	Aerial Installation	underground Installation
Permit for up to 5 miles of installation	$235	$125
Permit for up to 10 miles of installation	$390	$175
Permit for up to 15 miles of installation	$545	$225
Permit for up to 20 miles of installation	$700	$275

Wyoming

Wyoming Administrative Code and Utility ROW Encroachments 2020 authorized cooperative-owned utilities, broadband service, and entities to construct new facilities within the highway rights-of-way after applying for and obtaining a permit from the Wyoming Department of Transportation (WYDOT). In general, WYDOT prohibited private parties from installing parallel utility runs within rights-of-way except under special circumstances and may allow a small cell wireless facility in the right-of-way under a lease agreement. The WYDOT implement a dig-once policy to facilitate broadband services. WYDOT may permit parallel telecommunications and data cable encroachments on interstate rights-of-way under a shared resource agreement that benefits the State of Wyoming (Wyoming Administrative Code Transportation, Dept. of (045)).

Wyoming Statutes-Title15 authorizes governing body to enter into a franchise agreement with a communications company for access to public rights-of-way. The franchise agreement must be fair and reasonable, and the fees to be passed through to customers unless otherwise agreed. Also, WYDOT developed a Joint Occupancy Agreement for those instances where a utility facility with prior rights may be located within the highway right-of-way. Unfortunately, there is no permit fee schedule or clear compensation for utility accommodation in the state right-of-way.

APPENDIX E

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