REPORT TO THE LEGISLATURE PURSUANT TO ACT 145 of 2024, SECTION 14 STUDY; COMMUNICATIONS INFRASTRUCTURE, RIGHT-OF-WAY

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Submitted to

Senate Committees on Finance and on Transportation and the House Committees on Ways and Means, on Transportation, and on Environment and Energy.

Submitted by

Vermont Agency of Transportation

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Executive Summary

Pursuant to Act 145 (2024) Section 14, the Vermont Agency of Transportation (VTrans) was directed to conduct a study concerning access to and use of the public right-of-way (ROW) in Vermont by telephone (wired and wireless) and broadband companies, including to determine how the ROW is currently being accessed and used by such companies in Vermont and, in addition, shall review and assess how other jurisdictions outside Vermont manage and charge for such access and use. VHB has conducted comprehensive research to assist VTrans, focusing on reviewing existing processes, spatial data accuracy, data management, and comparative practices from other states regarding ROW utilization.

Key Findings

Data Completeness and Accuracy: The study revealed that Vermont's ROW and electric utility location data are generally complete and accurate, whereas communications infrastructure data is lacking in both areas. Effective infrastructure monetization requires improved GIS mapping and data processes.

Best Practices Scan: Research into other states' management of telecommunications in ROWs showed two primary strategies: (1) bartering for infrastructure improvements; and (2) revenue generation. Of all states scanned, interviewed and assessed, none had revenue generation as a primary focus. States like California, Colorado, and Virginia have implemented structured programs that facilitate both strategies, incorporating comprehensive data management practices and multi-stakeholder collaboration.

Contingent Recommendations

The following actions could be taken

Enhance Data Collection and Management: Improve the precision of telecommunication infrastructure data through better geolocation methods and collaboration with communications companies to regularly update data records, and successful electric utility partnerships.

Locate Program Strategically : Align the program's organizational structure to leverage its control over ROW, unless prioritizing statewide digital communications expansion may require locating it in another agency.

Engineer New Workflows and Staff Accordingly: Clearly define workflows and dependencies among relevant departments and partner agencies to ensure adequate staffing. Collaborative efforts should be prioritized to maintain updated mapping and effective program administration.

However, these would all be conditional upon recognition, further analysis, and understanding of the following:

(1) Limited interest in full collaboration by the telecom companies

(2) Lack of existing staff to execute

(3) Time delay for revenue receipt due to comprehensive data rebaselining and start-up process development and maturity

(4) Perception of fee paying being potentially "regressive."

(5) Could slow deployment of broadband in underserved areas

(6) Uncertain revenue estimates until data is resolved

(7) Uncertainty around whether revenue generated would pay for direct costs of program administration as well as more diffuse efforts required

Conclusion

A successful ROW monetization program in Vermont requires precise data management, significant development of workflow and processes, strategic legislative support, collaborative industry engagement, and transparent fee-structure frameworks. Currently the agency, while highly capable, is hobbled by the aforementioned challenges, and would have to allocate significant resources against an uncertain outcome..

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Introduction

The Vermont Agency of Transportation (VTrans) has conducted an exploration and assessment of broadband and telecommunications providers' use of state-owned rights-of-way (ROWs) for Transportation-related revenue generation, as directed by Act 145 (2024) Section 14.

To support this study VHB conducted (1) a review of existing processes and GIS products used by state agencies to collect, store, and access relevant data. The review focused on assessing available spatial data, data gaps, data accuracy and completion, evaluating update mechanisms, clarifying roles and responsibilities, and identifying further outreach needs necessary to fully characterize current telecom equipment data within the State ROW; and (2) conducted a scan of other states' approach to interaction with utilities around use of the ROW and any fee-paying associated.

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VTrans GIS Products and Processes

An understanding of where utility and communication infrastructure is located is required in order to better manage and monetize it. These assets were investigated to gain an understanding of the level of precision and accuracy in current Vermont utility location data.

Data Analysis

A web viewer compiling available and relevant GIS data was developed.

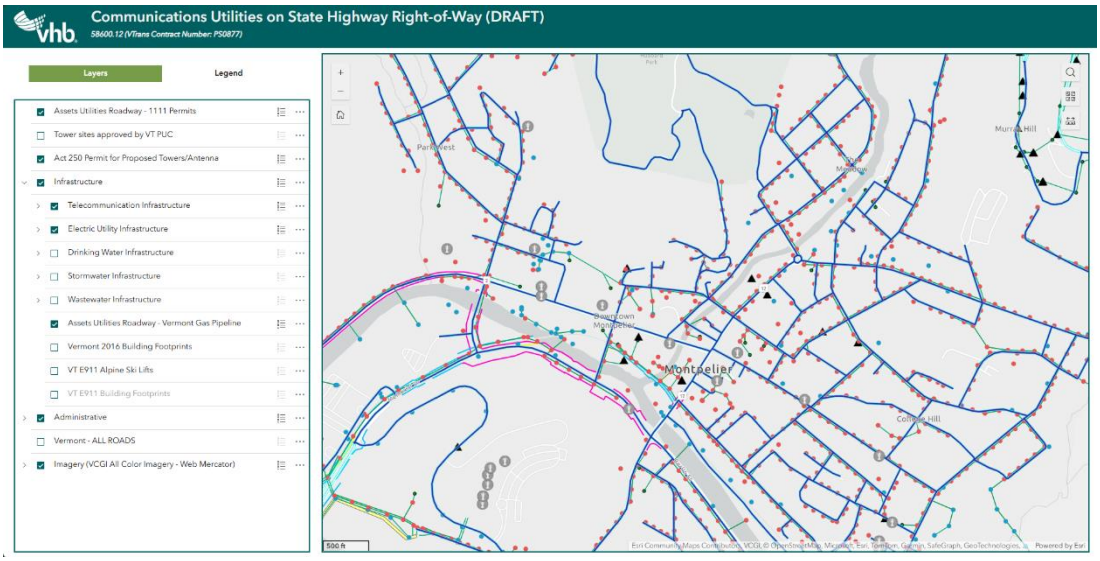

Figure 1 Communications Utilities on State Highway Right-of-Way Webmap

Data geographic coverage, attributes, and metadata were then reviewed and summarized in the attached table. Key fields include agency and roles responsible in gathering, mapping, storing data, relevance to telecommunications infrastructure, method for data production, and relative **accuracy** and **completeness**. The full table is provided in the Appendix of this report. A high-level overview of this table is provided in **Error! Reference source not found.** below. **Completeness** was considered relative to physical coverage area statewide (high indicates good coverage, low indicated poor geographic coverage) and presence of historical gaps (high indicates consistent history, low indicates significant gaps) in records. **Accuracy** was assessed based on spatial precision of location and the correctness of records, including presence of mechanisms to update records to reflect changes in field conditions.

Table 1 – Data Overview

Category	Dataset Name	Relative Completeness	Relative Accuracy
Communications	Broadband Status 2024	High	High
ROW	ROW Lines	High	Medium
ROW	1111 Permits	Medium	Low
Communications	Approved Communication Tower Sites	High	High
Communications	Act250 Permit for towers/antenna	Medium	Low
Communications	VT Telecommunication Facilities	Medium	Low
Communications	VT Data Fiber Routes 2024	Medium	Low
Communications	Cable Routes 2024	Medium	Low
Communications	Open Access Fiber routes	Low	-
Communications	Microcell Sites	TBD	TBD
Electric	Electric Substations	High	High
Electric	GMP - Power Pole Data	High	High
Electric	GMP - Power Surface Structure	High	High
Electric	GMP - Underground Structure Data	High	High
Electric	GMP - Power Line Data	High	High
Electric	WEC - Utility Poles	High	High
Electric	WEC - Utility Lines	High	High
Electric	VEC - Utility Poles	High	High
Electric	VEC - Primary Overhead & Underground Lines	High	High
Electric	Electric Power Transmission Lines	High	High
Electric	3-Phase Power	Medium	-
Structures	Building Footprints	High	Medium

As shown, the GIS data available for utilities in Vermont has significant gaps and variable accuracy. Completeness and accuracy are particularly low for communications utility infrastructure, and notably, GIS data for communication utility-owned poles is not available.

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Key Existing Data Findings

Key findings related to ROW, communications, electric utility, and permitting data accuracy and completeness analyzed are summarized below. Much of the data provided to the state is generalized and not spatially accurate. In the cases of complete and relatively accurate data, data format can impede ease of analysis. Improved data collection and processes would prove useful towards maintaining accurate and complete telecommunication datasets.

State ROW Data

The ROW dataset is maintained as a hosted feature service by VTrans. ROW lines are mapped using CADD files from surveys or record plans. The attribute table contains links to download CADD files stored within VTrans' local system, if available, or links to download scanned, georeferenced records plans, for a given ROW line segment. ROW lines are categorized by ownership (state, town, and historic). The dataset is largely complete across the state, except in areas where VTrans lacks digital records. .

Spatial accuracy varies depending on data sources:

- Record Plan-Based ROW Lines: 1-3 meters accuracy.
- CADD-Based ROW Lines: 1 meter or better accuracy.

Analysis Considerations:

- ROW data consist of open line geometry rather than closed polygons. Bounding geometry will need to be established in order to determine which utilities fall within the ROW. Determining/creating these closures is a time-consuming process.

Telecom & Communications Infrastructure

The Department of Public Service's Office of Telecommunications (PSD-T) annually requests data from service providers for telecommunications infrastructure routes and produces line datasets that approximate the location of cable and fiber service along roadways in Vermont, as well as broadband deployment throughout the state[1]. These datasets have coverage statewide as cable or fiber lines, but the locations are all generalized to the road centerlines or E911 Site Locations, rather than their actual locations. While these datasets are maintained through established workflows, the generalized spatial accuracy presents challenges for determining whether

[1] Vermont Open Geodata Portal - VT Data Fiber Routes 2024

telecommunication infrastructure represented in this data is within the ROW or not. Additionally, it's unclear to the degree that the datasets are updated to reflect field changes such as depreciated assets. It does not appear that telecom entities share any spatial data for their infrastructure themselves and in some cases may not have spatial data – this is a significant data gap. Broadband initiatives are resulting in rapid infrastructure changes and data, in general, is not keeping pace.

Electric Utilities

Publicly available electric utility datasets including transmission and distribution assets are typically built on the same records utility companies use internally to manage their resources and as such, offer relatively complete coverage and high accuracy data. This data is specifically relevant to this study because communication infrastructure owned by telecom entities are often attached to poles owned by electric utilities.

VHB assessed available electric utility data regarding attached communication utilities. This included reaching out to GMP, VEC and VHB employees with relevant experience to learn more about how electric utilities manage information regarding attached telecom infrastructure. The following findings were noted.

Electric Utility-Owned Fiber

- *GMP owns dedicated communication infrastructure, including fiber optic cables attached to their poles and radio towers. Fiber is installed on all transmission rebuilds.*
- *VEC owns strands within shared bundled cables, used for their automated metering infrastructure (AMI). Their data is updated monthly (manually) and automatically when changes are planned, an example of an effective data update workflow.*

External Fiber Attachments on Electric Utility Poles

- *External (non-electric owned) fiber optic cables are often attached to electric utility poles, bundled and shared among entities, with strands dedicated to different users.*
- *GMP and VEC maintain external pole attachment data. Attachments are primarily communications assets.*
- *Not all utility poles used by electric companies are electric utility-owned and not reflected in their data records.*

Transmission Corridors

- *Fiber routes are collocated with VELCO transmission lines. Transmission lines follow easements separate from road ROW but intersect at points.*

Permitted Work within ROW

These datasets include approved communication tower sites, Act250 permits for towers/antennae, and 1111 Permits. Although lacking a comprehensive digital database, 1111 Permits are particularly relevant and useful as a permit is required for any work within the state ROW.

The permit datasets are typically composites with varying sources, including digitized historic records and more recent data. Historic data is not generally mapped to accurate locations. Efforts are ongoing to improve completeness and accuracy. Moving forward, permitted data could be a valuable resource, particularly with existing updated geolocation mechanisms including a GIS mapping application to accurately map permit locations and by tracking more information about utilities in the spatial data. Capturing the location and details of utility work would support a more efficient workflow for maintaining and updating telecommunications datasets.

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Best Practices Research

In order to understand the state of the practice in monetization of communication infrastructure in the ROW, a best practice scan of state Departments of Transportation (DOTs) was conducted. This process included a comprehensive document and online search to identify key peers who currently monetize the ROW to better understand the diverse approaches employed by other states.

Best Practices Scan

VHB conducted an initial review of different features of the use of state-owned ROW. A number of different aspects of communication use of the ROW quickly came to light. First, research revealed two types of "payment" for communications in the ROW which are based on two fundamentally different motivations:

- **Bartering**: Some states engage in bartering arrangements where telecommunication entities provide services or infrastructure improvements in exchange for ROW access. This approach allows states to benefit from enhanced services or infrastructure upgrades without direct monetary transactions.
- **Revenue Generating**: includes policies and practices that enable the state to generate income from the use of ROW by telecommunication entities. States may implement fee structures, lease agreements, and other financial arrangements that create this

Through the initial research, two primary types of communication infrastructure were monetized:

- **Cell Tower**: Some states may have specific guidelines and permitting processes for the installation and management of cell towers in ROW.
- **Broadband/Fiber Optic**: Many states allow the installation and management of linear broadband and fiber optic infrastructure for either revenue to bartering. States may have streamlined permitting processes and supportive legislation to promote the expansion of high-speed internet services.

VHB conducted a more thorough best practices scan of other state DOTs to explore how each state is monetizing state-owned ROW. During this process, several research studies were reviewed, which helped identify some states for interviews.

Specifically, "Managing Longitudinal Utility Installations on Controlled Access Highway Right-of-Way"[2] and "Valuation and Compensation Approaches in Utility Accommodation: A Guide,"[3] both produced by the National Cooperative Highway Research Program (NCHRP), were reviewed in detail. The 10 states initially identified for more detailed research included the following:

- California
- Colorado
- Georgia
- Iowa
- Louisiana
- Maryland
- Utah
- Virginia
- West Virginia
- Wisconsin

Table 2 below illustrates the ROW policies of the 10 states whose programs were analyzed more closely. Focus areas in Table 2 include the legal background of the program, fee structure, whether bartering is present, ownership of the infrastructure, data management, and program-specific strategic goals. As shown, strategic goals identified for the programs in states studied focus around expanding communications networks rather than revenue generation.

[2] National Academies of Sciences, Engineering, and Medicine. 2014. Managing Longitudinal Utility Installations on Controlled Access Highway Right-of-Way. Washington, DC: The National Academies Press. https://doi.org/10.17226/22356.

[3] National Academies of Sciences, Engineering, and Medicine. 2023. Valuation and Compensation Approaches in Utility Accommodation: A Guide. Washington, DC: The National Academies Press. https://doi.org/10.17226/27163

Table 2 – Best Practices Investigation Details

State	Legal Framework and Authority	Compensation and Fee Structure	Trading of Services	Ownership and Oversight	Data Management	Strategic Goals
California	Senate Bill 156 and executive orders guide ROW policies; Caltrans manages ROW.	Licensing fees for ROW usage based on installation type; "Dig Once" policy.	Limited trading of services; focus on infrastructure sharing.	Managed by Caltrans; comprehensive infrastructure guidelines in place.	Encroachment Permit System (CEPS) for tracking installations.	Maximize property use for community planning; efficient broadband deployment.
Colorado	Governed by Senate Bill 22-083 and C.R.S. statutes; CDOT oversees ROW.	Fees or in-kind exchanges for ROW usage through Public-Private Initiatives.	In-kind infrastructure contributions (e.g., dark fiber) for CDOT's mission.	Managed by CDOT; facilitates partnerships and infrastructure alignment.	GIS mapping and fiber leasing agreements for digital infrastructure planning.	Enhance digital infrastructure and streamline ROW processes.
Iowa	Iowa Administrative Code 761 governs ROW policies; DOT coordinates.	Annual fees for longitudinal ROW access; exemptions for government use.	Occasional fiber sharing agreements with ITS staff coordination.	Managed by Iowa DOT; focuses on utility accommodation and state infrastructure.	Utility permits; procedures outlined in Utility Accommodation Manual.	Maximize utility accommodation and enhance network connectivity statewide.
Louisiana	Louisiana's ROW management is guided by the Louisiana Revised Statutes and specifically regulated by the Louisiana Department of Transportation and Development (DOTD).	Fees for ROW usage are determined based on infrastructure type and location, allowing for monetary payments or in-kind contributions.	Public-private partnerships are emphasized, encouraging infrastructure sharing for broadband expansion.	Managed by the DOTD, which ensures the integration of transportation and telecom infrastructure within the ROW.		Focus on expanding broadband access, improving statewide connectivity.
Maryland	Maryland Telecommunications Act and Resource Sharing Law guide policies.	Resource-sharing agreements; cash or services exchanged for ROW usage.	Strategic alliances for data services and infrastructure sharing.	Oversight by MDOT and DoIT for strategic IT outcomes.	Resource Sharing Agreements integrate telecom data with state IT services.	Encourage partnerships and maximize state infrastructure utility.
Utah	Utah Administrative Code R907-65 defines ROW compensation rules.	Monetary payments or in-kind contributions; lump-sum options available.	Contributions for UDOT's ITS programs enhance connectivity.	Managed by UDOT; coordinates statewide fiber optic network expansion.	Data integration with ITS systems; comprehensive mapping and planning.	Statewide fiber deployment, support for telemedicine and remote connections.
Virginia	Code of Virginia provides ROW fee structure since 1998; VDOT oversees ROW.	Public right of way fees for telecom use; focus on regulatory compliance.	Provisions for service exchanges exist under fee collection policies.	VDOT Broadband Coordinator manages infrastructure deployment.	Regulatory guidance and manuals support ROW management and maintenance.	Support broadband deployment, enhance state and local connectivity plans.

State	Legal Framework and Authority	Compensation and Fee Structure	Trading of Services	Ownership and Oversight	Data Management	Strategic Goals
West Virginia	WV Code §17-2A-17a covers the acquisition of property for utility accommodation purposes.	Encroachment permit fee equal to reimbursement for inspection fee cost.	Infrastructure sharing encouraged under a "Dig Once Policy," allowing for wireless and wireline facilities in ROW.	Managed by WV DOT, aligned with strategic infrastructure and broadband expansion plans.	Agreements must be competitively neutral and nondiscriminatory.	Improve statewide connectivity by facilitating broadband expansion through ROW access.
Wisconsin	WisDOT guidelines under Wis. Stat. ss. 86.07 regulate ROW usage.	Fees or infrastructure accepted for ROW use; 20-year occupation period.	Communication facilities and services accepted as payment for ROW access.	Managed by WisDOT; detailed documentation and digital permit processes.	GIS mapping for transparent and efficient ROW management.	Strategic development of telecommunications; optimize utility accommodations.

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Interviews

Using the list of states developed above, VHB researched contact information and requested interviews to learn more about the programs. VHB and VTrans jointly conducted interviews from April 28, 2025, through May 28, 2025. Each of the states listed above participated in the interviews except for Georgia, Louisiana, and West Virginia. Georgia and Louisiana were not responsive to multiple emails. West Virginia responded indicating that they did not establish a program after conducting a similar study in 2018. Detailed meeting notes or transcripts are provided in Appendix A. The key findings are listed below by subject area for a better understanding of the range of approaches to each subject area.

Organization Structure

The interviewees involved in managing telecommunications infrastructure within ROW are typically part of the ROW sections within state Departments of Transportation (DOTs) or equivalent agencies. Costs are borne, however, throughout the agency, in other staff sections, amongst field organizations, and through consultant support. Whether the costs associated with these more diffuse operations are covered by revenue collected is largely unknown. The organizational location of these groups varies significantly within DOTs. The exception is the state of Maryland, which instead operates their program out of the Department of Information Technology (DoIT) with the focus on resource sharing in Maryland.

Table 3 – Organization Location

State	Organization Location	Notes
California	DOT	Real Property Services within the Department of Right of Way
Colorado	DOT	Fiber and Broadband Coordination within the Intelligent Transportation System
Iowa	DOT	Utility Program within the Transportation Development Division
Maryland	DoIT	Resource Sharing Agreement (RSA) Program within Department of Information Technology. RSA coordinates heavily with the State Highway Administration.
Utah	DOT	Intelligent Transportation Systems, Fiber Optic Communications & Interstate Lighting Maintenance
Virginia	DOT	In two department – Right of Way and Utilities and Office of Land Use
Wisconsin	DOT	Bureau of Highway Maintenance

The discussion with many states was focused on the use of bartering or reduced fees to build either the state's overall communication network, or more frequently the DOTs ITS communication network. The location of Maryland's program in a separate department, DoIT, reflects this focus. UtahDOT, VDOT and Maryland specifically focus on the partnership with utilities to advance their own ITS, traffic signal, and other communication goals.

Overall, states that are either monetizing or bartering for communications in the ROW typically focus on linear fiber. Some states have also monetized cell tower locations, most often smaller cell tower installations, in limited access highway rights of way, with connections and access from outside of that right of way. This has a data management benefit in that it’s not a linear facility, and can more easily be geolocated, permitted, and constructed.

The monetization of limited-access rights-of-way, including interstate highways and other major freeways, was typical across various state programs. States such as Virginia, Wisconsin, and Iowa capitalize on these high-value corridors to facilitate telecommunications infrastructure development. Maryland has plans to expand their program from the interstate system onto the state highway system. In a Vermont context, the limited-access highway system would provide access to only a small portion of the state. Inclusion of state highways in the program would be more challenging due to limited rights of way and the more significant impact of topography adjacent to the travel way. As described above, limitations in the ROW data make determining ROW area difficult.

Table 4 – Locations of Communication Utilities

State	Locations of Communication Utilities	Notes
California	Interstate	Additionally, Roadside Rest Areas, Park and Ride Lots, Maintenance Stations, Storage Areas and Caltrans buildings
Colorado	Interstate	Goal is to expand the state's communication infrastructure.
Iowa	Interstate, Freeways	There are a few radio towers located near state-owned garages.
Maryland	Interstate, Freeways	Goal is to expand the state's communication infrastructure.
Utah	Interstate, State Highways	
Virginia	Interstate, Freeways	There are a few cell towers located in rest areas.
Wisconsin	Interstate	

Data Collection and Management

In analyzing the data collection and management practices across various states' ROW programs, a recurring theme identified was the critical importance of accurate infrastructure mapping. This is pivotal for efficient management and strategic planning of telecommunications deployments. Many states are adopting sophisticated mapping and data management software to facilitate this process. For instance, OSP Insight is commonly used by states such as Virginia and Maryland to provide comprehensive mapping capabilities that enhance visualization and management of underground and overhead infrastructure.

Utah employs Bentley software for detailed infrastructure design tasks, ensuring that precise modeling aligns with engineering requirements. ESRI, a leader in Geographic Information System (GIS) technology, is used for mapping purposes across Utah's ROW initiatives, allowing integration of spatial data to support extensive network planning. The technological tools used by each of the states are essential for maintaining precise records, supporting infrastructure updates, and ensuring efficient coordination among service providers, thus reinforcing the states' capacities to manage their digital infrastructure effectively.

Table 5 – Data Management

State	Mapping System	Notes
California	ArcGIS	ROW team does the mapping.
Colorado	ArcGIS	Office of Information Technology maintains it.
Iowa	No system	
Maryland	OSP Insight, ArcGIS	Currently working on building out their database.
Utah	ArcGIS, Bentley	Have a very robust mapping network. Contract out GIS support. Convert Bentley files to ArcGIS.
Virginia	OSP Insight	Currently building the database. Mapping new locations currently and going to bring in old plans.
Wisconsin	No system	Working towards creating a more sophisticated mapping system but currently use coordinate locations.

Agreements

In managing telecommunications infrastructure within the ROW, states adopt various approaches, using leases, permits, or a combination of both to align with strategic goals and regulatory compliance. Contracts or permits issued for ROW monetization programs typically include agreed compensation, an indemnification clause to protect against state liability for damage, location data, site plans, and as-built plans.

States like California and Virginia primarily use leases. California issues licenses and leases under its Wireless Telecommunications Program, allowing telecom facilities on state ROWs through Master License Agreements. In Virginia, leasing arrangements, labeled Resource Sharing Agreements (RSAs) are used for installations in limited-access ROWs.

Conversely, states such as Colorado, Iowa, and Wisconsin rely on permits for managing ROW usage. Colorado issues Fiber Communication Permits, enabling entities to pay fees or provide in-kind compensation for ROW access. Iowa requires utility permits for telecommunications installations within interstate and freeway ROW, ensuring alignment with utility accommodation guidelines. Wisconsin mandates utility permits for telecom infrastructure, with providers needing permits to occupy state trunk highway ROWs. Meanwhile, Maryland and Utah deploy a mixed-use strategy that integrates both leases and permits. Maryland emphasized resource-sharing agreements, using these when there is an exchange of services and potentially incorporating permits into broader leasing strategies for specific telecom and broadband installations.

Utah engages in compensation agreements that may involve lease structures alongside permits related to ROW expansion and fiber network deployment. The length of terms for these agreements varies based on the type of infrastructure but typically spans 20-25 years for fiber optic cable installations and around 10 years for tower installations.

Compensation

The compensation associated with locating utilities in the ROW can vary significantly depending on the form of payment and the scope of the project. Agreements can be either fee-based or structured as barters, where in-kind compensation is exchanged for access. Typically, the cost is

determined by various factors such as the type of infrastructure (e.g., fiber optics, cell towers), the length of the installation (measured by footage or mileage), and the rurality of the installation site. Some states, like Utah, have successfully used ROW programs to trade services and build out the state's fiber network, which supports the DOT's Intelligent Transportation System (ITS) network as well as other departments' fiber needs. The capacity created with these agreements is particularly advantageous when attempting to connect to existing or proposed ITS devices. This contrasts with the potential focus on revenue generation.

In-Kind vs. Fee-Based Compensation

The choice between in-kind compensation and monetary fees often hinges the goals of the State and/or DOT particularly. In-kind compensation can be particularly advantageous when aligned with broader state fiber infrastructure goals, such as expanding digital coverage statewide or DOT goals like improving ITS connectivity and most states interviewed focused more on in-kind compensation than fee-based compensation.

Range of Costs and Methods of Calculation

Cost structures and calculation methods are also diverse. ROW access fees are generally provided on a per-mile or per-foot basis, often reflecting a "market rate" adjusted according to location characteristics, such as a lower cost in a rural setting where connectivity improvements are desired. In Colorado, fiber-optic installations incur both an initial per-mile fee and an annual rate, while Wisconsin opts for a one-time fee covering a 20-year contract period, which can reduce administrative overhead and costs associated with annual renewals. Most typically, with the exception of Maryland, the bases for the fees were not clearly documented nor tied to costs associated with the programs.

Table 6 – Agreements, Compensation and Calculations

State	Type	Term	Compensation
California	Master License Agreement (MLA)	10-years with two 5-year renewals	The fee structure within the Master License Agreement is determined based on the geographic location and type of telecommunications facility, with annual fees subject to automatic 2.5% increases for inflation and adjustments reflecting fair market value, ensuring equitable and consistent access to state property for broadband expansion.
Colorado	Permit		Initial, One-Time Application Fee (2024) › $0.05 per foot Annual Property Use Rate (2024) › $0.10 per foot for urban counties* (>200k population) $0.03 per foot for rural counties
Iowa	Permit		When a multiduct system is required by the department: flat fee of $14,500 per cable installation or $7,250 per mile of cable, whichever is greater. All other installations: flat fee of $12,000 per cable installation or $2,500 per mile of cable, whichever is greater. These fees shall increase 3% per year after the base year of 2004.
Maryland	Resource Sharing Agreement (RSA), Permit	30 years	Mixed revenue approach with both monetary compensation and in-kind exchanges, such as fiber swaps, enabling infrastructure build-out without direct costs. The agreement allows a company to use state-owned property for installing fiber optics, with costs calculated based on land use, distance, and maintenance, including terms for initial and potential renewal periods.
Utah	In-Kind Services, Permit	30 years	UDOT favors in-kind services rather than cash payments. Across the fence valuation every 5-years.
Virginia	Resource Sharing Agreement (RSA), Permit	25 years	The fees are calculated by multiplying the number of public highway miles by a set rate when considering new installations. The minimum fee per access line is $0.50 per access line. Across the fence valuation is used.
Wisconsin	Permit, In-Kind Exchange	20 years	Across the fence valuation is used to determine the value of land use for fiber optic installation based on adjacent property values. They implemented a one-time 20-year fee based on mileage, allowing for simplicity and long-term cost stability for installations. This system also included options for tradeoffs, such as providing dark fiber, which has been instrumental in expanding their intelligent transportation system, allowing for enhanced communication capabilities and infrastructure development.

Resulting Fiscal Benefits

The benefits of ROW use programs tend to lie in the expansion of broadband networks, either for public use or for state infrastructure needs, rather than revenue generation. Typically, revenue generation results in a programmatic break-even or reinvestment into further ITS and broadband redeployment. Many states emphasize the benefits of expanding broadband capacity, such as savings in digital development and enhancing public internet access. Utah has reportedly saved around $106 million through their program.

In contrast, Colorado's program revenue primarily sustains the team managing ROW, covering approximately six salaries (although there are additional staffing needs of the program). In Iowa, revenue from the monetization of ROW is tied to the state's Living Roadway Trust Fund, supporting initiatives that incorporate native vegetation management within highway ROWs.

Table 7 – Use of Revenue

State	Use of Revenue
California	Funds go into the State Transportation Fund for future transportation projects.
Colorado	Primarily used to sustain the fiber and broadband program team, covering salaries and operational costs.
Iowa	Funds are directed to the Living Roadway Trust Fund, supporting roadside vegetation management and ecological enhancements. Funds do not cover permitting or other staff costs in the group or other staff costs outside that group.
Maryland	Revenue enhances digital infrastructure for state IT services, including broadband expansion and supporting governmental operations.
Utah	Used primarily through in-kind contributions to enhance the state’s fiber optic network, supporting ITS and connectivity services.
Virginia	Used to enhance broadband infrastructure deployment, aligning with federal and state connectivity goals.
Wisconsin	Supports telecommunications infrastructure expansion, specifically targeting ITS enhancements and using dark fiber trades.

Staffing Needs

Staffing needs varied by state. Iowa’s program fees do not cover staffing costs or other DOT outside the program in permitting and roadside management, who require financial support. Iowa has experienced issues related to staff turnover, complicated accounting system management, and emphasized the need for efficient reporting to track billing and payments.

Utah's fiber optic system is managed by a team of four full-time employees and supported by full-time network engineers from the Division of Technology Services. They have a five-year contract with Horrocks Engineering for GIS support, trade analysis, splice details, mapping, and right-of-way expertise. Legislative funding helps maintain the necessary staffing levels to efficiently run telecommunication projects.

Maryland's staffing approach for managing the resource sharing agreement program involves a staff of one at the Maryland Department of Information Technology (DoIT), overseeing about 260 agreements. While program oversight is managed by only one person, the operational

workload, such as permitting processes, is mainly handled by the Maryland Department of Transportation (MDOT), with support from agencies like the Department of Natural Resources and the Maryland Military Department. These agencies have personnel responsible for managing agreements in coordination with DoIT. Legal review ensures compliance with legislative and agency guidelines. Collaboration across state agencies, such as MDOT and others.

Table 8 – Staffing Notes

State	Staffing Notes
California	Four senior ROW agents from the Division of Right of Way, including one dedicated to the wireless program, manage leasing within Caltrans' Airspace program, which is uniquely separate from their permitting office.
Colorado	Six staff manage the program across different regions, with costs covered primarily by revenue from the ROW program. They look for opportunity for collaboration and shared responsibility among regions.
Iowa	Utility program staff within Iowa DOT manage the program, but fees do not fully cover staffing costs. The staff is involved in permitting and coordination processes, with other groups assisting with other related work.
Maryland	Managed by a single staff member at DoIT, overseeing about 260 agreements. The program relies on interagency support and significant collaboration between DOT, DoIT, and other branches of the Maryland government. This makes operational workload manageable, especially in permitting and compliance.
Utah	Managed by four full-time employees, supplemented by contracted GIS and engineering support. Extensive external contracting to address specialized needs, such as mapping and technical expertise.
Virginia	Managed within VDOT's Right of Way and Utilities sections and Office of Land Use. Program involves multiple personnel across different departments for comprehensive management.
Wisconsin	Staffed by Bureau of Highway Maintenance personnel, who handle all permits. Consultants have been hired to perform inspections on larger projects when staffing needs were too high. The permittee pays the consultant.

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Recommendations

As outlined above, electric utility information is generally complete and accurate, however communications utility information tends to be somewhat incomplete and very inaccurate, with the exception of broadband infrastructure. Improving infrastructure location data and processes is a requirement to successfully monetize the ROW. In addition, the structure of the program is very important to its success. To this end, several recommendations and best practices for the setup of a program, if one were to be established, are outlined below.

Vermont Context Recommendations

Engage Communications Companies

Engage with communications companies to update their location information. There may be limited incentives for communications companies to participate in the process to update the VTrans dataset. Identify ways to provide value – such as improved planning coordination or permitting efficiency – to encourage their participation.

Verify Presence and Relevance of Existing Assets

Conduct a systematic review of existing data to confirm the presence of infrastructure in mapped locations. Focus on identifying gaps, updating depreciated assets and flagging those that may no longer be relevant. Efforts can be prioritized by corridor or region.

ROW and 1111 Permit Data Enhancements

Improve geolocation methods and data storage to ensure a comprehensive, high-quality data base of permitted sites. Track utility-related details within permit applications and use this information to flag telecommunications dataset records for review and potential updates—enabling a semi-passive update mechanism.

Continue to invest in ROW data updates, with emphasis on replacing lower-accuracy inputs. Recently, VTrans ROW and the GIS team implemented a process to incorporate the latest ROW boundaries from project plan design files (DGNs) at the point of ROW clear updating all ROW for current projects. A new "entry method" field has been added to the ROW dataset through this task to indicate data accuracy—distinguishing ROW lines georeferenced JPEGs from higher-

accuracy DGN files. Improving ROW data supports future implementation of polygon-based features, enabling geoprocessing and analysis of utilities within the ROW.

Develop a Standardized Data Workflow

Establish a formal process where communications companies regularly provide accurate and detailed infrastructure data to the state or a designated data curator. Follow a model similar to the electric utilities/VCGI partnership with clearly set expectations for higher data quality and specificity.

Achieving Accurate Geolocation of Existing Assets

Transition historic telecommunications data from generalized road centerline snapping to precise geolocation. Identify and focus on priority corridors where accurate data can significantly impact planning and develop a framework for regularly updating telecommunications data as new field data or surveys become available. Assemble telecommunication routes that are known, but not currently recorded in a comprehensive dataset. Survey utility information collected during highway or structure project development could further improve master dataset quality.

Program Recommendations

Program Location within Government Structure

Most States locate their program within DOTs, as they control access to the ROW. With a study focus of understanding monetizing the ROW, locating a program within VTrans would be consistent with this approach. If the program focus were to shift to expanding the state's digital communications network, locating it in another Agency may be more appropriate.

Organizational Structure and Staffing

Although the states varied in how many individuals (from one to six) were directly involved in the day to day operations of the group responsible for managing the communications infrastructure in the ROW program, every state indicated that the program relied on significant support from other groups in the DOT, and even consultants, to provide the services necessary. Overall interviewees were not able to confirm these costs were covered by what was received in kind or in fee. In Vermont's case there would be staff requirements from VTrans Right of Way, Utilities and Permits, and Mapping, and from the Division of Public Services and Agency of Digital Services, as well as cooperation from VTrans Project Delivery, Construction and perhaps even District staff to ensure that mapping is kept current. The workflows and dependencies between these groups will need to be well defined to determine whether adequate staffing is available and if not, how would the agency address the delta.

Administration and Operational Aspects

Vermont would need to develop both administration and operational workflows for the program including:

- Establishing robust accounting and billing systems.

- Developing clear clauses in agreements. Examples of details to be developed include how maintenance of the communication infrastructure is accomplished/allowed and what are requirements of the utility and VTrans in cases of roadway construction or damage.

Develop and Justify Rates

A frequent comment provided by states interviewed was to identify that rate systems were not developed in a transparent manner with documentation provided to the utilities (or even DOT staff). Companies interested in participating in the program should be able to access both the rates and their justification. Rates should be based upon economic factors related to program costs and fair market value and not be arbitrary. Rate increases should be tied to an economic indicator and not require justification for infrequent rate increases that result in large disparity between lease holders. Where possible, limiting lease durations is preferred.

Industry Collaboration

In general, successful programs were ones where the state effectively collaborated with private industry. Mutual benefit is a very important outcome, as companies will not involve themselves with a program that doesn't provide value.