



September 14, 2020

Docket Management Facility,  
Docket Number: FHWA-2019-0037  
U.S. DOT Docket Operations Facility (M-30),  
West Building, 1200 New Jersey Avenue SE,  
Washington, DC 20590-0001

Re: Federal Highway Administration (FHWA), U.S. Department of Transportation (DOT) Notice of Proposed Rulemaking (NPRM) for Broadband Infrastructure Deployment, Docket Number: FHWA-2019-0037 Docket RIN 2125-AF92  
Comments of the Fiber Optic Sensing Association.<sup>i</sup>

Dear Administrator:

The Fiber Optic Sensing Association ("FOSA") appreciates the opportunity to submit comments to the Federal Highway Administration (FHWA), U.S. Department of Transportation (DOT), on its Notice of Proposed Rulemaking (NPRM) regarding "Broadband Infrastructure Deployment." (CFR: 23 CFR Part 645, Federal Register Number: 85 FR 49328, August 13, 2020)

The Fiber Optic Sensing Association (FOSA) was founded in 2017 as a non-profit organization to educate industry, government, and the general public on the benefits of fiber optic sensing technologies that enhance public safety, promote the security of critical facilities and infrastructure, and protect the environment. Our 22 members include organizations that manufacture, install, test, evaluate, support, and/or use fiber optic sensing systems and equipment.<sup>ii</sup>

At the most basic level, Dig Once reduces the number and scale of excavations along highway rights-of-way when installing telecommunications infrastructure. In effect, it applies the admonishment familiar to builders and carpenters to "Measure Twice, Cut Once." In the context of infrastructure construction, this advice reminds us to double-check in advance to avoid unnecessary waste later.

To promote a better understanding of the issues and considerations associated with "Dig Once," our association has developed three documents:

- **FOSA DIG ONCE PRIMER** (Attachment 1)<sup>iii</sup>
- **DIG ONCE POLICY: 16 STATE MODELS** (Attachment 2)<sup>iv</sup>
- **FOSA – DFOS Installation Considerations for Highways** (Attachment 3)<sup>v</sup>

## I. FOSA Supports Dig Once

The Fiber Optic Sensing Association strongly concurs with the FHWA's threshold conclusion that: ..... "[i]t is in the public interest for utility facilities to use jointly the ROW of public roads and streets when such use and occupancy do not adversely affect highway or traffic safety, or otherwise impair the highway or its aesthetic quality, and does not conflict with Federal, State, or local laws and regulations."<sup>vi</sup> This statement also appropriately captures the Dig Once objectives contained in the Mobile Now Act.<sup>vii</sup>

The potential benefits of a coordinated approach to conduit and fiber installation accrue not only to public agencies, but as well to participating private telecommunications providers and adjacent communities. A coordinated Dig Once initiative can also provide capacity for multiple separate service providers. Advantages include:

- Cost Savings—Reducing the frequency that transportation and utility channels are opened is approximately ten times cheaper than adding broadband infrastructure after these have already been built.<sup>viii</sup> These savings are the most pronounced in high-density areas when underground installation is the only available option.
- Increased Access to and Reliability of Broadband Networks— Laying fiber in unserved areas gives residents access to broadband networks more quickly. Additionally, installing fiber for communities that already have broadband enhances network reliability and promotes broadband competition, which will lead to more choices and lower prices for consumers.
- Public Benefits—Dig Once policies can cut government telecommunications costs and support public safety. Decreased road construction reduces traffic congestion and lengthens infrastructure lifespans by avoiding further construction disruptions.
- Economic Benefits— Broadband benefits existing businesses and encourages future economic activity in unserved communities by drawing businesses to the area.

## II. Dig Once Economic Models

While supporting the Dig Once concept broadly, FOSA also recognizes that no one single economic model for it works in every context or in all geographies. Consequently, prioritizing Dig Once opportunities avoids wasting resources where conduit use is unlikely. For example, the availability of nearby utility poles at a reasonable attachment cost will reduce Dig Once's cost-benefit appeal. Projects extending only a short distance or that are isolated from existing fiber and conduit infrastructure have reduced attractiveness. Similarly, projects in lower-density areas, or that are distant from government facilities, community anchor institutions, or large developments typically deserve a reduced priority.

To ensure that Dig Once projects are both financially feasible and consistent with a community's goals, FOSA recognizes that agencies must review a variety of factors:

- The ability to place fiber optic cable and/or conduit over long, continuous stretches;

- The proximity of a possible Dig Once project to government and community anchor facilities that can benefit from a possible broadband connection;
- The interest in conduit from partners or customers (e.g., government departments, or communications service providers). Related subsidiary considerations include:
  - The prospects for placing conduits and fiber optic cable near development sites, data centers, or similar facilities.
  - Beneficial project cost (i.e., prioritizing projects with lower-than-average costs);
  - Synergies with opportunistic major projects, such as highway, mass transit, or bridge replacement.
- The lack of cost-effective alternatives due to physical constraints in the vicinity (e.g., targets of opportunity such as bridges or freeway underpasses) or the lack of capacity on utility poles along a route.
- The ability to bridge major rights-of-way crossings, such as railroad, water, highway, or interstate. These can be more difficult for private telecommunication carriers to navigate on their own, making partnerships with government more attractive.

The NPRM appropriately addresses the potential costs associated with its implementation. However, FOSA notes that experience demonstrates that Dig Once implementations can also generate revenues for state and local departments of transportation.

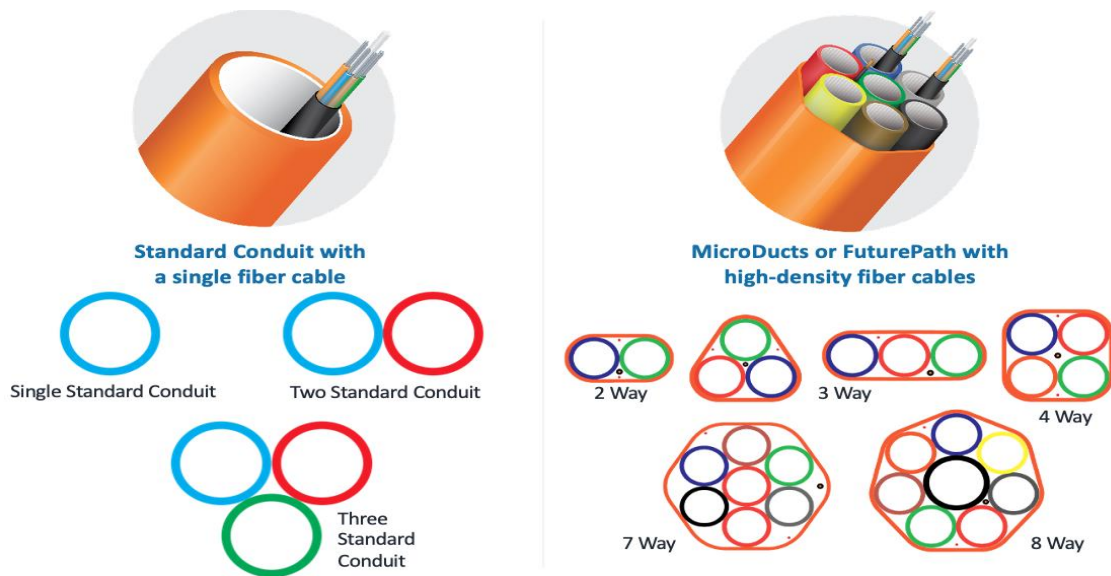
As identified in FOSA's Dig Once primer, three general approaches by governments exist in capitalizing on Dig Once opportunities for below-ground, wireline installations along highway rights-of-way:

- Publicly owned and operated networks: Government installs, owns, and maintains conduit and in some cases, fiber optic lines as well. Government assumes the commercial risk of unused conduits.
- Privately-owned and operated networks: The conduit is installed, owned, and maintained by a private entity, and fiber optic lines are also privately owned and operated with minimal government involvement. In some instances, as part of the agreement for using public rights-of-way, the private entity may install extra conduit for the public entity to have for its own use. A private company assumes the commercial risks of underused conduits.
- Resource Sharing: Resource sharing, sometimes referred to as bartering or trading, is a type of agreement that governments make with service providers for the exchange of the use of rights-of-way or existing infrastructure with fiber optic services. These services often provide state transportation departments with connections to ITS infrastructure, such as operations facilities, cameras, and message signs along roadways. This type of agreement has proved successful in many areas of the country for expanding ITS networks into unserved areas.

Finally, we note that the presence of fiber optic cable, or even the availability of conduit, will facilitate emerging broadband applications, such as smart roads. As result, Dig Once installations can help "future-proof" transportation arteries.

### III. Conduit Use Recommended

FOSA strongly encourages that Dig Once policies actively consider the use of conduits to enable future installation of fiber optic cable. Conduits are narrow pipes and initially need not contain fiber optic cable housed within them. However, fiber cable can be installed within these conduits either at the time of initial installation or at a future date. These conduits provide mechanical protection of the fiber cable, both during the installation of the fiber cable and over the entire life of the fiber cable.



Typically, direct buried fiber cables require additional design enhancements to withstand environmental conditions, whereas the conduit can provide that environmental, tensile, and crush protection itself. The conduit itself is relatively inexpensive, so installing conduits for later use can save providers hundreds of thousands of dollars in construction costs.

Telecommunications providers, however, will sometimes only use cable and not conduits in their installations. If local government is not familiar with engineering standards, it can contract with a provider to install conduits that can be used by others. In addition to installation, the government will need to work out who is responsible for mapping the location of the conduit and maintenance. A service-level agreement or service-level management agreement can address these issues.

By planning for the future and installing conduit to furnish extra permanent pathways, the networks can adapt to changes more quickly.

As the GAO has noted "For instance, if companies have access to a state-owned conduit, they may be able to deploy fiber through that conduit without completing steps such as environmental impact studies, which would have been completed at the time of conduit installation."<sup>ix</sup>

As GAO has further noted "Officials in some localities also stated that access to locally owned conduit has reduced local government telecommunications costs. Second, some officials stated that a dig once policy might lead to decreases in broadband prices and/or increased broadband performance for consumers because of potentially increased competition resulting from the availability of conduit open to all broadband providers. Third, officials in some localities, as well as industry stakeholders, stated that increased access to broadband benefits existing businesses and could draw new businesses to the area, both of which could increase local economic activity."<sup>x</sup>

#### **IV. Conclusion**

As noted above, FOSA supports Dig Once policies to reduce the number and scale of excavations along highway rights-of-way. Beyond this, though, Dig Once policies can expand the availability of broadband telecommunications. Additionally, it can further future-proof transportation infrastructure's access to advanced intelligent transportation and smart cities applications.

Our association welcomes the opportunity to work supportively with the Department of Transportation, the Federal Highway Administration, and state & local transportation agencies to operationalize the Dig Once concept fully.

Sincerely,

/s/ Mark Uncapher

Mark Uncapher,  
Executive Director

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<sup>i</sup> Federal Register 85, no. 25 (February 6, 2020): 7162.

<sup>ii</sup> For more information regarding the Fiber Optic Sensing Association, see <https://www.fiberopticsensing.org/>

<sup>iii</sup> On the Fiber Optic Sensing Association website at <https://www.fiberopticsensing.org/p/cm/ld/fid=726&tid=357&sid=3216>

<sup>iv</sup> On the Fiber Optic Sensing Association website at: <https://www.fiberopticsensing.org/p/cm/ld/fid=726&tid=357&sid=3217>

<sup>v</sup> On the Fiber Optic Sensing Association website at: <https://www.fiberopticsensing.org/p/cm/ld/fid=836&tid=358&sid=2885>

<sup>vi</sup> NPRM at 85 FR 49329

<sup>vii</sup> The Consolidated Appropriations Act, 2018 (Pub. L. 115-141), Division P, Title VII (“MOBILE NOW Act”), Section 607, Broadband Infrastructure Deployment (47 U.S.C. 1504)

<sup>viii</sup> <https://www.fhwa.dot.gov/policy/otps/workplan.cfm>

<sup>ix</sup> United States Government Accountability Office, Broadband Conduit Deployment, June 27, 2012, GAO- 12-687R, at <https://www.gao.gov/assets/600/591928.pdf>

<sup>x</sup> Ibid