# DIG SMART: Best Practices for Cities and States Adopting Dig Once Policies

## EXECUTIVE SUMMARY

Advanced fiber networks and high speed broadband are increasingly important to a community's quality of life and a healthy local economy. An essential step to deploying broadband is installing conduit and fiber, often in underground trenches where other similar infrastructure is also located. This installation process requires excavators to dig in the public rights-of-way, frequently in areas that are already paved or developed. Excavation is both disruptive to the community and expensive for the service provider.

Cities and states can reduce excavation costs, minimize disruption in public rights of way, and encourage broadband deployment through "Dig Once." Dig Once encompasses several approaches to installing conduit in conjunction with other compatible construction projects.

This paper focuses on the most impactful form of this policy: governments installing conduit whenever there is underground construction in the public right of way -- whether that construction is for installing new utility equipment, repairs, or road work. The government then has the opportunity to lease that conduit to broadband providers that are interested in deploying fiber networks to the community. This approach benefits the community by facilitating broadband entry and by giving the government an ongoing revenue source. In fact, as we will show, these revenues can more than make up for the initial capital expense. While some governments may be hesitant to pay for conduit themselves because of its short-term budget impact, they can recoup that investment over time while also creating significant benefits from the community.

To distinguish it from other types of "Dig Once" policies, we call this approach "Dig Smart."This paper lays out the benefits of Dig Smart, how to implement Dig Smart, and the practical implications of Dig Smart.

## I. DIG SMART POLICIES BENEFIT LOCAL COMMUNITIES.

Dig Smart benefits local governments and residents by promoting the deployment of advanced fiber networks and broadband competition. Dig Smart policies mandate the installation of conduit throughout public rights-of-way, lowering costs for providing broadband service and making a community more attractive for broadband providers hoping to break into a new market or expand their existing operations. The resulting competition leads to more choices

and lower prices for consumers. In addition, Dig Smart policies decrease the frequency of inconvenient and possibly dangerous construction along roadways, protect the reliability of broadband networks, and incentivize providers to lay fiber underground, hiding unsightly equipment and beautifying the community.

### A. Dig Smart Promotes Competition in Broadband, Which Benefits Consumers.

Lack of competition is a serious problem in the broadband market. The Federal Communications Commission found that nearly 75% of homes have *at most* one choice in a provider of fixed Internet access at download speeds of 25 Mbps (the current definition for "broadband" and the minimum the FCC says is necessary to access the most advanced online applications).[1]

Without competition, consumers often are charged higher broadband Internet access prices. The Center for Public Integrity conducted an international comparative study on broadband competition, looking at the differences between comparable U.S. and French cities.[2] The French cities, on average, had seven choices in broadband service providers, whereas the U.S. cities averaged out to two choices.[3] In the U.S. cities, prices for broadband were up to *three and a half times higher* than in the French cities.[4]

One of the primary reasons competition is lacking in the broadband marketplace is that the barriers to entry are so high. The upfront costs of deploying broadband service are enormous – particularly for the most advanced fixed residential broadband service, fiber-to-the-premises. The most expensive part of deploying advanced fiber networks is the physical installation of conduit to hold the fiber, due to the costs of excavation.[5] Indeed, the Federal Highway

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1 Federal Communications Commission, Fact Sheet: FCC Chairman: More Competition Needed in a High-Speed Broadband Market 1 (2014), https://apps.fcc.gov/edocs_public/attachmatch/DOC-329160A1.pdf.

2 Allan Holmes and Chris Zubak-Skees, *U.S. Internet Users Pay More and Have Fewer Choices than Europeans*, Center for Public Integrity (Apr. 1, 2015), http://www.publicintegrity.org/2015/04/01/16998/us-internet-users-pay-more-and-have-fewer-choices-europeans.

3 *Id.*

4 *Id*.

5 Jon Brodkin, *One Big Reason We Lack Internet Competition: Starting an ISP is Really Hard*, ARS Technica (Apr. 6, 2014), http://arstechnica.com/business/2014/04/one-big-reason-we-lack-internet-competition-starting-an-isp-is-really-hard/. The FCC found that installation costs were the largest cost element to deploying broadband via fiber. U.S. Dept. of Transp., Fed. Highway Admin., Office of Policy and Governmental Affairs, Executive Order: Accelerating Broadband Infrastructure Development 16 (2012), http://www.fhwa.dot.gov/policy/otps/workplan.pdf. The percentage cost of conduit as compared to the excavation project itself is only 0.1% to 4.3%. Gigabit Communities:

Administration estimates that it is ten times more expensive to install fiber where the provider has to excavate and repair an existing road than it would be to install fiber in conjunction with other roadwork.[6]

Dig Smart policies specifically address the costs of excavation in installing new conduit. San Francisco estimates that implementation of its Dig Smart law will lead to cost savings in excavation ranging from 25%-33%.[7] By minimizing the costs associated with conduit installation with a Dig Smart policy, more broadband providers will be able to compete in the marketplace and deploy broadband services. This will promote greater competition, which will foster lower prices, prompt incumbents to engage in more consumer-friendly behavior and lead to more choices for a community's residents.

### B. Dig Smart Reduces Disruptive Repeated Excavation.

Installing equipment underground is disruptive, especially in areas that are already paved or developed or have underground infrastructure present. Excavators must first work through the jurisdiction's "locates" system to notify existing underground infrastructure owners and then those owners must mark the location of their facilities. Then the excavator must dig trenches where the conduit can be installed, which typically involves jackhammering through pavement. The excavators must surround the trenches with barricades, warning devices, and covers because the trenches are usually where people will encounter them. With each additional excavation, communities face risks to public safety, traffic disruption, risk of property damage service outages, and wasted government resources.

***Traffic Disruption and Road Deterioration.*** Putting conduit underground alleviates crowding in urban public space, but the issues associated with excavation are exacerbated in these urban areas. Excavation along roadways will often halt or impede traffic, sometimes for

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Technical Strategies for Facilitating Public or Private Broadband Construction in Your Community, http://www.ctcnet.us/wp-content/uploads/2014/01/GigabitCommunities.pdf

[6] *Eshoo, Walden Introduce "Dig Once" Broadband Deployment Bill,* Eshoo.House.Gov (Oct. 22, 2015), https://eshoo.house.gov/issues/economy/eshoo-walden-introduce-Dig Once-broadband-deployment-bill/.

[7] *See* U.S. Gov't Accountability Off., GAO-12-168R, Broadband Conduit Deployment 5 (2012), http://www.gao.gov/assets/600/591928.pdf; San Francisco, Cal., Ordinance 220-14 (Oct. 6, 2014) (codified in various provisions of the S.F. Public Works Code), http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances14/o0220-14.pdf. In addition, he Utah Department of Transportation estimated cost savings of 15.5% per mile when conduit and fiber are installed at the time a road is being constructed versus installing the conduit and fiber at a later time. U.S. Gov't Accountability Off., GAO-12-168R, Broadband Conduit Deployment 5 (2012), http://www.gao.gov/assets/600/591928.pdf. It is worth noting that the cost savings here are largely due to no longer having to re-excavate; laying conduit is enough to reap the benefits of the cost savings, as stringing the fiber generally does not require re-excavation. *Id.*

lengthy periods of time, and create traffic congestion that increases vehicular accidents and wastes commuters' time.[8] In addition, without Dig Smart, construction initiated by a broadband provider is often re-excavation, meaning that many roads have been excavated previously to install underground infrastructure. Like an article of clothing that is patched and patched again, repeated excavation damages the integrity of the road and shortens its lifespan.[9]

***Public Safety and Service Outages.*** Excavating where utilities already exist comes with other risks. Although state authorities require various locates processes before excavators may begin digging,[10] there is always the chance that the excavator may inadvertently damage existing equipment underground, sometimes because the underground equipment operator failed to accurately mark its facilities.[11] Fiber is often installed alongside established utility infrastructure (*e.g.*, gas or electric). Any damage to those pipes or cables could cause a serious disruption of services and harm to surrounding property. The math is simple: the more often excavations occur around existing utilities, particularly for distribution of natural gas, the more likely that gas lines or other utilities are struck resulting in significant risks to life and property.

***Wasted Governmental Resources.*** Underground conduit installation requires time and resources from both the excavator and the government. Because excavations involve public safety and environmental concerns, there are a number of legal and regulatory hurdles to approving a dig.[12] Excavation usually requires permits from the state or local permitting authority.[13] Indeed, if the excavation extends through a wide area, the excavator may need to seek permits in multiple jurisdictions. Further, governments will sometimes undertake (or require the excavator to undertake) environmental reviews for excavations, depending on how

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8 *Id*.

9 U.S. Gov't Accountability Off., GAO-12-168R, Broadband Conduit Deployment 5 (2012), http://www.gao.gov/assets/600/591928.pdf.

10 *See, e.g.*, Cal. Gov't Code § 4216.2(a)(1); Ga. Code Ann. § 25-9-6(a); 220 Ill. Comp. Stat. 50/4; Kan. Stat. Ann. § 66-1804(a); Mo. Rev. Stat. § 319.026; Or. Admin. R. § 952-001-0050; Tex. Util. Code Ann. § 251.151(a).

11 CommScope, Broadband Applications and Construction Manual 8.2 (2014) http://www.commscope.com/Docs/Fiber_Optics_Const_Manual_CO-107147.pdf ("high consideration" is given to locates marks when determining excavation damages).

12 U.S. Gov't Accountability Off., GAO-12-168R, Broadband Conduit Deployment (2012), http://www.gao.gov/assets/600/591928.pdf.

13 *See, e.g.*, Mass. Gen. Laws ch. 81, § 21 ("No state highway shall be dug up … without written permit of the department …"); 605 Ill. Comp. Stat. 5/9-113 ("No … equipment of any public utility company, municipal corporation or other public or private corporation, association, or person shall be located ... under or along any highway, or upon any township or district road, without first obtaining written consent of the appropriate highway authority...").

extensive the excavations may be.[14] Governments must spend time and resources that could be conserved by only having to do the permitting and reviewing once.[15]

### C. Dig Smart Incentivizes Installing Fiber Underground.

With Dig Smart in place, broadband providers can more easily and cost-effectively install fiber underground. Thus, the policy encourages broadband providers to choose to place their fiber underground rather than along utility poles. Undergrounding fiber has some significant advantages, including better service reliability and more attractive neighborhoods.

***Service Reliability.*** Underground fiber improves the reliability of broadband services.[16] Unlike fiber attached to exposed poles, underground fiber is protected from ice, falling trees, high winds, natural disasters, lightning, sabotage, and other types of destruction, as well as decaying pole infrastructure.[17] This leads to fewer outages. Fiber on poles also requires more maintenance, such as trimming trees to prevent them from interfering with the lines, as well as other repairs from normal wear and tear of open-air exposure.[18] Placing lines underground therefore reduces the costs of providing service and facilitates competition.

***Aesthetics.*** Communities generally prefer to have fiber underground for aesthetic reasons as well because it eliminates unsightly utility poles and hanging lines that obscure the landscape.[19]

## II. How to Implement Dig Smart.

Dig Smart mandates government installation of conduit whenever excavation occurs in the public right-of-way and where government-owned conduit does not already exist, whether a private entity is excavating or the government is digging for a public works project. Dig Smart

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[14] California Environmental Quality Act, Cal. Pub. Res. Code § 21000 *et seq*. This statute, and others like it, requires an in-depth environmental impact report for all activities for which private entities receive a government-issued permit.

[15] U.S. Gov't Accountability Off., GAO-12-168R, Broadband Conduit Deployment 6 (2012), http://www.gao.gov/assets/600/591928.pdf.

[16] *Id*. at 5.

[17] *Cf.* Edison Electric Institute, Out of Sight, Out of Mind 2012: An Updated Study on the Undergrounding of Overhead Power Lines (2012), http://www.eei.org/issuesandpolicy/electricreliability/undergrounding/documents/undergroundreport.pdf.

[18] *Id.* at 25.

[19] Edison Electric Institute, Out of Sight, Out of Mind 2012: An Updated Study on the Undergrounding of Overhead Power Lines 5 (2012), http://www.eei.org/issuesandpolicy/electricreliability/undergrounding/documents/undergroundreport.pdf.

includes requirements that developers of new subdivisions install conduit or other appropriate or necessary communications infrastructure to each residence in the subdivision and in public or homeowner's association rights-of-way in the subdivision. With mandatory conduit installation, the Dig Smart approach is for the government to pay for the extra incremental costs of laying down the conduit, with the government retaining ownership of the installed conduit.

Dig Smart also minimizes legal controversies; unlike with respect to a private service provider installing underground infrastructure on private property, the applicable government entity already possesses authority to control construction in the public rights-of-way. Governments also possess broad latitude to condition the grant of construction permits in the public rights-of-way.[20] Even in states where municipal broadband is restricted,[21] Dig Smart is an appropriate and lawful approach; municipalities would not be running afoul of such restrictions on providing service, as the conduit itself is not a service but only a facility.

With Dig Smart, conduit is installed as excavation occurs, gradually increasing coverage of the conduit network around the community with each new construction project. Dig Smart makes the community ready for deployment of advanced broadband services and eliminates additional excavation necessary to make those services a reality. In addition, service providers do not have to shoulder the added burden of seeking trenching partners or paying for the costs of conduit installation, and thus the opportunity to lease government conduit will encourage them to build a fiber network in the community. By maintaining ownership of the conduit, the government generates revenue by leasing those valuable assets out to broadband providers interested in providing fiber service to the community. Dig Smart works for the community and works for the government.

For governments desiring to reap the community benefits of adopting Dig Smart, model legislation is included in Appendix A.

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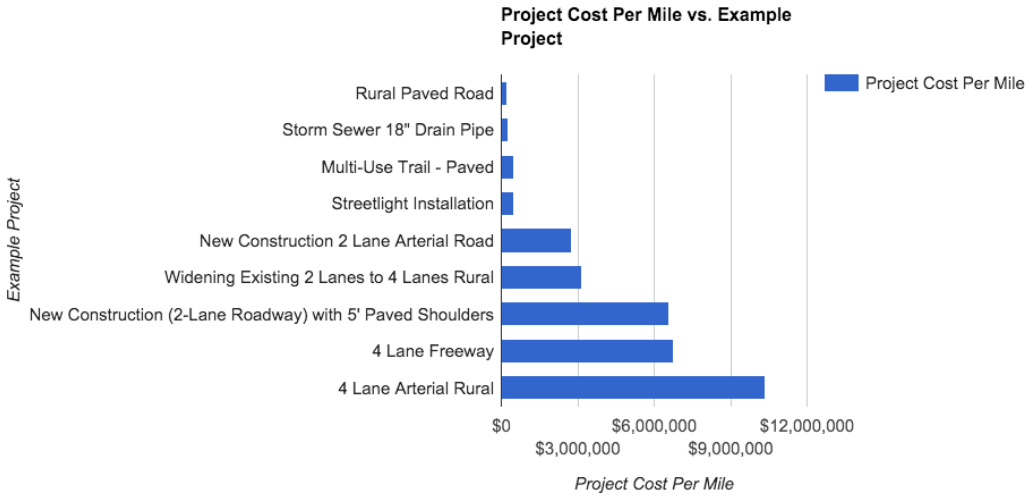
[20] *See Jason Koebler, The 21 Laws States Use to Crush Broadband Competition, Motherboard (Jan. 14, 2015), http://motherboard.vice.com/read/the-21-laws-states-use-to-crush-broadband-competition.*

[21] Dig Once ideas—including Dig Smart—tend to be politically popular, supported by Democrats and Republicans. The federal Dig Once House bill, sponsored by Rep. Eshoo (D-Calif.) and Rep. Walden (R-Or.), received praise from both sides of the aisle, along with endorsements from FCC Commissioners Rosenworcel (a Democrat) and Pai (a Republican). *See* Moriah, Mensah, *"Dig Once" Could Lead to Smarter Broadband*, R Street (Jan. 14, 2016), http://www.rstreet.org/2016/01/14/dig-once-could-lead-to-smarter-broadband/. *See also* Amir Nasr, *Widely Supported 'Dig Once' Bill Faces Procedural Hurdles*, Morning Consult (Nov. 18, 2015), http://morningconsult.com/2015/11/widely-supported-dig-once-bill-faces-procedural-hurdles/; Alisha Green, Bipartisan "Dig Once" Legislation Provides Hope for Broadband Expansion, Government Technology (Nov. 2, 2015), http://www.govtech.com/network/Bipartisan-Dig-Once-Legislation-Provides-Hope-for-Broadband-Expansion.html ("At least one issue on Capitol Hill brings together Republicans, Democrats, the tech industry, and the White House: legislation to expand high-speed Internet access nationwide, especially for rural, tribal, and other remote areas.").

### A. How Dig Smart Works for Governments in Practice

Governments can use Dig Smart as a source of potential revenue, once the municipality or other governmental authority has installed enough conduit to interest broadband providers in leasing. With a private excavation project, the government typically would pay the costs for materials (the conduit itself), installing the conduit in the excavated trench, and any design variations in a private excavation project required to facilitate conduit installation. For public works projects, the government can install conduit in conjunction with existing construction much less expensively than would be possible in a separate excavation and installation project. The costs of conduit, including materials and installation, are slight relative to the expenses for digging up and repairing the ground.[22] Sample road and underground construction costs from various cities generally run from $200,000 per mile for something like a sewer replacement to $10 million per mile for larger road system construction.

**Figure 1**[23]




In contrast, the average cost of the conduit itself is around $10,000 per mile (or around $1.90 per foot), making it 0.1% to 4.3% of the total cost of any given excavation project.[24]

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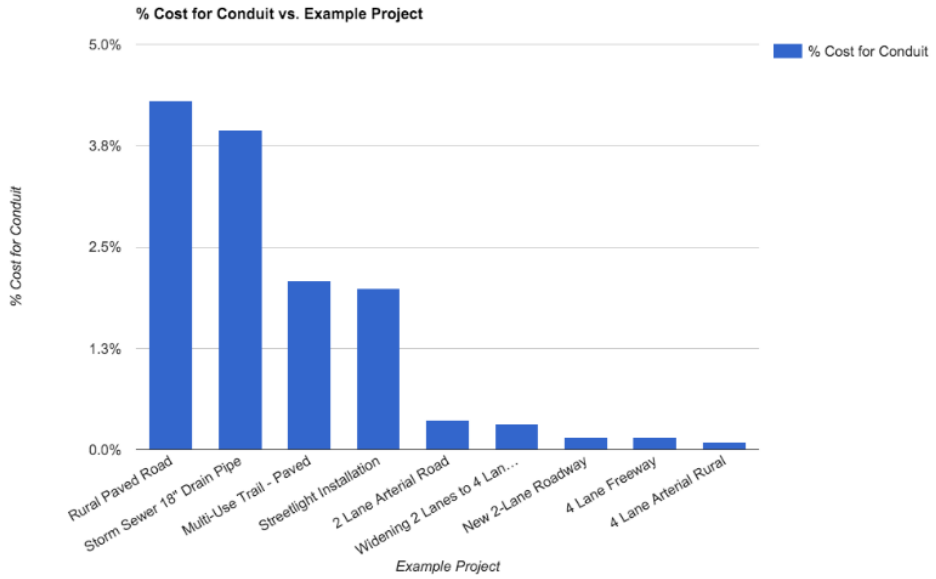
[22] U.S. Dept. of Transp., Fed. Highway Admin., Office of Policy and Governmental Affairs, Executive Order: Accelerating Broadband Infrastructure Development 16 (2012), http://www.fhwa.dot.gov/policy/otps/workplan.pdf ("[T]he largest cost element for deploying broadband via fiber optic cable is the cost of placement, such as burying the fiber in the ground, rather than the cost of the fiber itself.").

[23] Data from discussions with BHC Rhodes, civil engineering firm: http://ibhc.com/

[24] *Gigabit Community: Technical Strategies for Facilitating Public or Private Broadband Construction in Your Community*, http://www.ctcnet.us/blog/gigabit-communities-how-local-governments-can-facilitate-private-investment-in-new-gigabit-networks/.

**Figure 2**[25]




Dig Smart does require the government to pay certain upfront construction costs on top of the actual cost of the conduit itself. Installation will often require additional fees for design changes in trenching—the trenching required for sewer lines, for example, may not be the kind typically used for conduit and accommodating those changes will incur design costs. Other additional costs may include extra labor fees for installation. However, the cost of installation should be considered an investment. Governments can usually install conduit at a discounted rate per linear mile as compared with private utilities.[26] Moreover, after installation, the government will own the conduit and, because it is in the public right-of-way, the government will not owe any licensing fees to any landowner on which the conduit is located. The government would then lease the conduit to a broadband provider and recover the modest costs of installation.

The following example shows how quickly the government would be able to recover its investment. Assume the cost of the conduit itself and extra conduit installation fees (independent of the main excavation costs) is $25,000 per mile (or $4.73 per foot).[27] Private service providers typically lease installed conduit for between $0.65 and $0.80 per linear foot of conduit per year. With a lease rate of $0.65 per linear foot of conduit annually, a local agency would more than recover its upfront installation costs after 8 years of leasing (8 x $0.65 = $5.20).

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[25] Data from discussions with BHC Rhodes, civil engineering firm: http://ibhc.com/

[26] Data from discussions with BHC Rhodes, civil engineering firm: http://ibhc.com/

[27] This is not meant to be an exact number on how much installation of conduit would cost, but rather, an approximation, with an illustration on how such a policy could be profitable over time.

The 8-year period here is a minimal estimate, too, especially if the government manages to secure multiple lessees. Where the government installs conduit with multiple duct banks to accommodate multiple providers, it can recover costs more quickly with adequate demand. The additional revenue could be used for a number of purposes, including covering internal costs for managing the public rights-of-way. Below is an example on calculating a return on investment ("ROI"), assuming a lease to just one broadband service provider.

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|---|---|
| Fiber Installation Cost (per mile) | $25,000 |
| Fiber Lease Rate (per mile per year) | $3,432 (or $0.65 per foot) |
| 10-Year Income | $34,320 |
| Return-On-Investment (ROI) Example | 37% |

To protect its investment in the conduit and discourage re-excavation, a government can also require that new broadband providers use existing conduit to the maximum extent feasible. Of course, the government is unlikely to obtain lessees immediately upon implementing Dig Smart legislation. Broadband providers would want to lease conduit after the community has a critical mass of conduit network already in place, and the actual recovery time of installation costs will depend on when broadband providers lease the government's assets. Accordingly, governments interested in Dig Smart should enact legislation as soon as possible, because the benefits of Dig Smart begin to accrue as more excavation projects are undertaken. Once Dig Smart is in place, a government can begin building up enough conduit to begin leasing it to generate revenue in excess of costs.

### B. Other Ways to Encourage Dig Smart

States too should be interested in bringing more broadband options to their citizens. States, of course, can implement Dig Smart policies and install conduit when excavating rights-of-way under state jurisdiction. Although states do not control access to local rights-of-way, states can encourage Dig Smart policies at the municipal level in at least two ways.

First, states may adopt resolutions or other legislative policies that encourage municipal enactment of Dig Smart laws.[28] This allows states to signal support for Dig Smart at no cost to the state.

Second, states may consider creating a monetary incentive for municipalities to adopt Dig Smart laws. States could condition grant of certain funds for local governments based on the local government implementing a Dig Smart policy. For instance, state road construction funding could be conditioned on the locality installing conduit that will increase the opportunities in the local community for better advanced communications services.

[28] *See* Minn. Stat. § 237.90; Fla. Stat. § 364.0135.

## III. OTHER "FLAVORS" OF DIG ONCE

Dig Smart is the gold standard of Dig Once. There are other types of Dig Once that are unlikely to be as effective as Dig Smart but nonetheless encourage broadband deployment while reducing the burdens of additional excavations. These other types of Dig Once are described here and compared to the advantages of Dig Smart. The primary other "flavors" of Dig Once policies and laws are: (1) coordination, (2) voluntary joint trenching, and (3) mandatory joint trenching.

***(1) Coordination.***[29] Coordination requirements help inform interested excavators, such as broadband providers, when underground or road construction is going to happen so that they can be prepared to install equipment in conjunction with scheduled excavations. Coordination is facilitated by governments establishing a "coordination database" and requiring underground facilities owners to update the coordination database with information on upcoming scheduled excavation. Interested excavators may then use this database for coordinating underground facilities installation with existing planned construction.

A coordination policy requires governments to expend resources on organizing and posting information from different entities. While a coordination policy would help some enterprising service providers in identifying excavation areas where they could potentially coordinate installation of their equipment, the marginal benefits of this are low, and it in no way guarantees that conduit will actually be installed. Coordination databases rely on the existence of other interested entities to effectuate infrastructure deployment. Where no service provider is already building in the market and therefore monitoring the database, opportunities to install conduit when there is planned excavation in the public rights-of-way may be missed. Moreover, this policy by itself does not allow the government to control for quality or for competition-maximizing conduit that has room to accommodate more than one fiber cable. Finally, with coordination, any installed conduit will be the property of the private entity, rather than the government. The government, therefore, has little direct opportunity to earn a return from implementing a coordination policy.

***(2) Voluntary Joint Trenching.*** Voluntary joint trenching requires entities that have received approval to excavate in public rights-of-way to formulate construction plans, and schedule construction, with other service providers that are interested in installing or maintaining equipment in public rights-of-way.[30]

Voluntary joint trenching (in contrast with mandatory joint trenching, discussed below) is termed "voluntary" because the policy relies on other excavators volunteering to jointly trench for the Dig Once benefits to be realized. (The initial excavator is required, however, to formulate construction plans with and schedule construction with other service providers that want to jointly trench.) The disadvantage of this approach to Dig Once is that if no broadband provider comes forward within the allotted time after the lead excavator notifies of an

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[29] *See, e.g.*, Santa Monica, Cal., Mun. Code, § 7.06.300(b); Minn. Stat. § 161.462.

[30] *See, e.g.*, 30-092 Vt. Code R. § 8091; Ocala, Florida, Mun. Code, § 58.136.

excavation, then no conduit would be installed. Interested service providers could miss the window for joint trenching and end up having to re-excavate. Indeed, a provider that does not yet exist by definition cannot take advantage of this opportunity. Voluntary joint trenching has many of the same drawbacks as a coordination policy. Ultimately, this policy would *encourage* more efficient excavations (and additional deployment of broadband network infrastructure) but not *guarantee* it. Although governments should not depend on voluntary joint trenching as a reliable means of achieving Dig Once objectives, if companies wish to jointly trench, governments should not prevent them from negotiating a private solution to excavation and conduit installation. Industry-driven initiatives in joint trenching can work in tandem with Dig Smart laws to minimize excavation and maximize installation of conduit.

***(3) Mandatory Joint Trenching.*** Mandatory joint trenching requires all potential excavators to install their infrastructure in the same trench at the same time. All parties then split the costs of the excavation.[31] A mandatory joint trenching law would require that all excavators determine a "lead." That lead excavator would then approach the city to receive a "joint trench" permit on behalf of all the service providers installing underground infrastructure in the excavation.

Mandatory joint trenching makes installation of conduit more certain than with voluntary joint trenching, as broadband providers must install conduit where it does not already exist as part of the joint trenching. Some municipalities with this type of joint trenching also have an enforcement clause that prevents re-excavation within a certain amount of time.[32] But these restrictions on re-excavation (often called moratoria) can delay broadband deployment and discourage competition if an interested broadband service provider misses the window. If broadband providers miss the period for joint excavation, they could be barred from re-excavating for years. This delay would work against the goals of Dig Once, which include deploying more broadband for consumers. In addition, other types of non-broadband excavators could be shut out from installing important equipment for their services. Ultimately, these unintended consequences could hurt various service providers and local residents.

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[31] *See, e.g.,* Los Angeles Department of Public Works, Joint Trench Utility Permit Guidelines (2015), http://dpw.lacounty.gov/general/forms/download/2175.pdf.

[32] *See* Houston, Texas, Mun. Code, § 40-145.

## CONCLUSION

High-speed broadband Internet access brings greater prosperity and convenience to communities. Local and state government policy therefore should facilitate more competition in the broadband market. Dig Smart is a win-win policy for states and municipalities, as residents benefit from broadband competition (bringing faster service at lower prices) and less excavation disruptions. Unlike some other government initiatives, Dig Smart has the potential for government to recoup funds spent on public works through leasing of conduit. Dig Smart is the best way for communities to accelerate deployment of the fastest, most advanced broadband and should be seriously considered by any city or state that wants to bring better services to its residents.

## APPENDIX A: MODEL LEGISLATION

This appendix includes model legislation for (1) municipalities or states to implement Dig Smart policies and (2) states to facilitate Dig Smart policies at the municipal level. The model legislation here also includes definitions and sensible exceptions for Dig Smart requirements (*e.g.*, in cases of emergency repair).

These provisions may be adapted for municipal or state use. In place of "city" or "state" the model legislation uses Government Entity. These provisions are models to serve as a starting point for cities and states interested in obtaining the benefits of Dig Smart; the provisions may be altered as appropriate or necessary to conform to specific community preferences and existing laws.

### *Definitions*

Section XX.XX

As used in this chapter creating "Dig Smart" requirements, the following definitions apply:

(1) "Communications Infrastructure" means conduit installed in public rights of way that can accommodate at least two separate fiber optic cables.

(2) "Developer" means any person or private entity that proposes to subdivide, divides or causes to be divided real property into a subdivision.

(3) "Emergency" means an Unexpected Occurrence requiring prompt action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services.

(4) "Excavate" or "Excavation" means any work or action in which earth, rock, pavement, or other material in the ground or underwater in a public right-of-way is moved, removed, or otherwise displaced by means of tools, equipment, or explosives in any of the following ways: grading, trenching, digging, ditching, drilling, tunneling, scraping, cable or pipe plowing and driving, or any other means.

(5) "Excavator" means any person, private entity, or Government Entity that engages in Excavation or has applied for a permit from Government Entity to Excavate.

(6) "Operator" means any person, private entity, or Government Entity that owns, operates, or maintains Underground Facilities.

(7) "Public Works Project" means any Excavation project undertaken by Government Entity.

(8) "Underground Facilities" means underground or submerged conductor, pipe, structure, conduit, or equipment used or installed for use in providing electric or communications service or in carrying, providing, or gathering gas, oil or oil products, sewage,

wastewater, storm drainage, or water or other liquids. All Underground Facilities shall be considered to extend up to the connection to the customer's facilities.

(9) "Unexpected Occurrence" is an unexpected event, including without limitation fires, floods, earthquakes, or other soil or geologic movements, riots, accidents, and damage to Underground Facilities requiring repair.

***Exceptions to Dig Smart Requirements***

Section XX.XX

(a) Emergency. Operators, Excavators, and Developers are not required to comply with "Dig Smart" requirements in cases of Excavation because of an Emergency.

(b) *De Minimis* Excavation. Notwithstanding anything else set forth in this chapter, "Dig Smart" requirements involving Excavation only apply when the contiguous length of the proposed Excavation will be at least 900 linear feet in the public right-of way.

***Mandatory Installation of Conduit***

Section XX.XX

(a) Installation of Conduit in Public Rights-of-Way in Public Works Projects. Whenever an agency or department of the Government Entity undertakes a Public Works Project involving the planning, construction, reconstruction, or repaving of a public right-of-way, such project shall include, to the maximum extent practicable and feasible, installation of underground Communications Infrastructure by the Government Entity.

(b) Installation of Conduit in Public Rights-of-Way in Other Excavations.

(1) To the maximum extent practicable and feasible, the Government Entity shall condition all Excavation permits on the installation of underground Communications Infrastructure on behalf of the Government Entity.

(2) The Government Entity shall provide at the Government Entity's cost the necessary materials (but not any equipment used for installation) for the permittee to install underground Communications Infrastructure in the public right-of-way.

(3) The Government Entity shall bear all reasonable and documented design and construction costs associated solely with inclusion of the Government Entity's Communications Infrastructure in the Excavation.

(4) Title to the installed Communications Infrastructure provided by the Government Entity shall vest in the Government Entity upon installation without any further action of the Excavator or the Government Entity.

***State Facilitation of Local Dig Smart***

Section XX.X

To the extent practicable, the Department of XX shall encourage and assist local units of government to adopt and implement "Dig Smart" policies for construction or other improvements to county state-aid highways, municipal state-aid roads, and any other rights-of-way under the local unit of government's jurisdiction. "Dig Smart" refers to policies that require the government entity to install conduit in conjunction with excavation along public rights-of-way.

## APPENDIX B: ADDITIONAL RESOURCES

- Federal Highway Administration Policy Brief on Dig Once
- Executive Order on Dig Once
- U.S. Government Accountability Office Study on Dig Once
- Study on the Effects of Undergrounding Power Lines
- Article on Eshoo-Walden House Bill