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WORLD ECONOMIC FORUM

Dig Once for Digital Infrastructure

BENCHMARK REPORT

JULY 2021

This publication forms part of a suite of benchmark reports produced by the G20 Global Smart Cities Alliance to analyse trends in smart city governance across the 36 Pioneer Cities of the Alliance.

Introduction

Digital infrastructure – wired and wireless connectivity – is the physical foundation for any smart city. However, rolling out this infrastructure can be complex and costly. The largest single cost is typically the civil works required to lay fibre and install equipment. According to the US Federal Highway Administration (FHWA), "90% of the cost of deploying broadband is when the work requires significant excavation of the roadway."[1] These works also result in significant disruption to citizens, businesses and cities.

A "Dig Once" policy aims to simplify and accelerate the roll-out of digital infrastructure, through driving strategic collaboration between cities, connectivity providers, utility companies and other urban stakeholders. At its simplest, a Dig Once policy aims for:

1. New builds and developments to be connected from the outset: by ensuring the installation of conduits (and connectivity) during the construction phase to avoid further works

2. Existing builds and other assets to have future-proofed connectivity: through coordinating highway, street and other works of utility companies, connectivity providers and other stakeholders to reduce the need for multiple excavations – and to ensure the installation of conduits

3. The delivery of multipurpose connectivity: by ensuring the installation, provision and sustainability of the crucial conduits that will drive next-generation connectivity (including 5G, the internet of things [IoT] and new Wi-Fi technologies)

A Dig Once policy reduces inconvenience and disruption to citizens, accelerates the roll-outs of connectivity providers and reduces the administrative and wider burden on cities and local authorities. It highlights the central role of the city in ensuring the delivery of connectivity and making sure no one is left behind, or excluded, from the potential that it can enable (including in tackling the broader digital divide).

Some 30 Pioneer Cities provided details about their Dig Once policies. Figure 1 shows the extent to which a policy for Dig Once has been adopted in these Pioneer Cities.

Key findings

– **Less than half of Pioneer Cities have a Dig Once policy in written form** (12/30 cities), **but more than half implement Dig Once in practice** (16/30 cities). Compared to other model policies, cities are performing better in this model policy area (Figure 1).

– A list of notifiable activities ensures that authorities are informed when construction, street work and other activities are planned – providing an opportunity to facilitate collaboration and minimize disruption (a requirement for achieving Dig Once). **Half of Pioneer Cities maintain a list of notifiable activities** (15/30 cities). This implies the other half may not be able to effectively coordinate works.[2]

– The model policy for Dig Once highlights that cities need governance processes to coordinate and drive connectivity roll-outs. The governance structure, which must be agreed upon locally, can range from a steering group to a more formal arrangement. **Only one-third of Pioneer Cities have a governance process to drive connectivity roll-outs** (8/30 cities).[3]

– **Complex political structures can make governance and coordination a challenge**. Many Pioneer Cities with multilayer governance, such as a national government and city government, struggle to achieve coordination between multiple stakeholders. For instance, in Istanbul, different aspects of the city infrastructure are managed by different authorities – while connectivity policies (and legislation) are often decided at a national level.[4]

– More advanced cities make use of geographic information system (GIS) records to keep track of connectivity assets. A city should maintain an accurate record of all connectivity assets in a GIS-based platform and keep records of how conduits are being used. Similarly, the private sector must be encouraged to share data with city governments to record all relevant connectivity assets. **Encouragingly, nearly one-third of Pioneer Cities track connectivity assets through GIS records** (11/30 cities).[5]

– Although Dig Once as a concept is well known, cities have struggled to articulate and implement it

> Funding from the federal government would not have been enough to install fibre in smart poles in 2017 without alignment between the infrastructure provider and the utility provider to reduce cost. [We] do not have a written policy, but we practise it. Lack of a written policy led to some missed opportunities because we did not get funding in time.[8]
>
> **Newcastle,** Australia

in practice. **About half of the Pioneer Cities are familiar with the concept of Dig Once** (14/30 cities),[6] and **fewer cities have an actual Dig Once policy in place** (12/30 cities).[7] This may be due in part to uncertainty as to where connectivity policy sits within a city administration, the challenges of engaging with a fast-moving area (driven by the private sector) and a complex range of technical aspects related to passive enabling infrastructure (conduits, pits etc.). The absence of a written policy can limit the ability of cities to obtain the full benefits of Dig Once.

– **A Dig Once policy, coupled with partnership models for financing, can help cities to make national and other funding go further.**

The current state of play

Dig Once is a concept with which cities are instinctively familiar. Even so, many cities struggle to adopt it despite the benefits it offers for digital infrastructure roll-out. Cities should consider the following steps to address this issue:

– Action starts with information: half of the Pioneer Cities do not have a list of notifiable activities or a GIS record of connectivity assets, making coordination between stakeholders difficult. The model policy for Dig Once sets out steps to rectify this information gap.

– Governance processes and engagement with key stakeholders are needed for sustainable implementation: these can be formal or informal, but cities must identify ways to drive inclusive connectivity roll-outs.

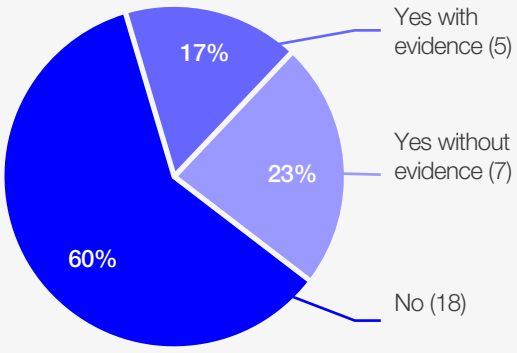
– Cities should develop "build once and build for the future" specifications for passive enabling infrastructure (conduits, pits etc.) that can be easily deployed.

– Cities should encourage more engagement and dialogue with the private sector and aim to shape true collaboration for the benefit of citizens.

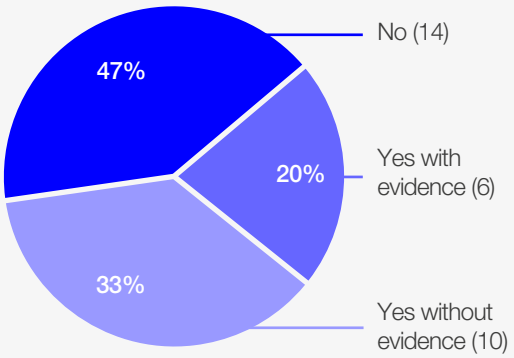
More guidance on these points can be found in the model policy.

FIGURE 1 **Adoption and implementation of policies for digital infrastructure**

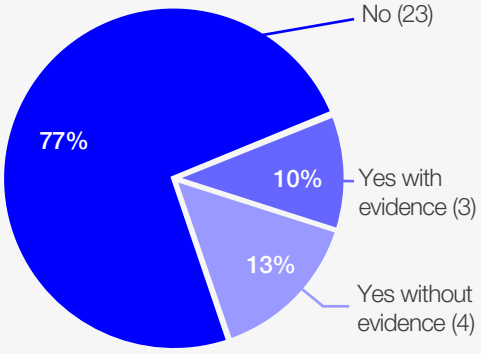
Cities with a written policy[9,10]



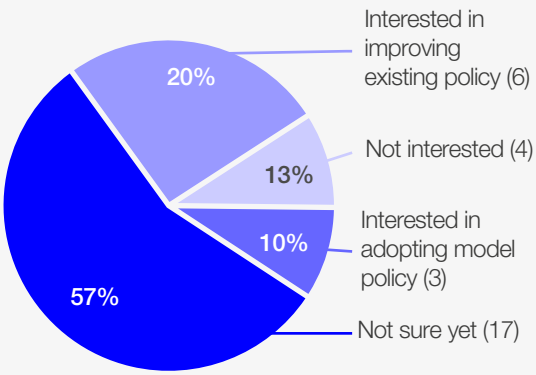
Cities with policies implemented[11,12]



Cities with funding/resources allocated[13,14]



Cities interested in the model policy[15,16]



Source: Deloitte analysis of Pioneer City Policy Assessment data, March 2021

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- Chattanooga, United States
- Cordoba, Argentina
- Daegu, South Korea
- Dubai, United Arab Emirates
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- Lisbon, Portugal
- London, United Kingdom
- Maebashi, Japan
- Manila, Philippines
- Melbourne, Australia
- Mexico City, Mexico
- Milan, Italy
- Newcastle, Australia
- Toronto, Canada

Endnotes

1. US FHAW, “Policy Brief”, October 2013: https://www.fhwa.dot.gov/policy/otps/policy_brief_dig_once.pdf?fbclid=IwAR2LN0i543qpz8IDCLNV_cjd9t0GHtB3g3bSJ_X2dci0f5ajLVqOqaIkW-E (link as of 15/6/21).
2. DO5.1: “Does your city have a list of notifiable activities (e.g. new builds, street works) which present opportunities for conduit installation and for which the city must be notified?”
3. DO5.3: “Does your city have a governance process to drive roll-out of digital connectivity and engagement with connectivity stakeholders?” (e.g. steering groups or trusts created to manage common assets)
4. Interview with Istanbul city officials, conducted on 9/3/21, on Zoom.
5. DO5.5: “Does your city use GIS records to manage connectivity assets?”
6. DO6.3: “Prior to reading the policy, or participating in the Alliance, were you familiar with the concept of ‘Dig Once’?”
7. Ibid.
8. Interview with city officials of Newcastle, conducted on 9/3/21, on Zoom. .
9. Pioneer City Assessment Survey DO2.1: “Does your city have any written policy (or set of policies) to install digital connectivity during construction, development or any other works that require excavation or access to buildings (e.g. requesting connectivity providers to install digital infrastructure when other utility providers are undertaking streetworks)?”
10. DO2.3: “Please share a link to the most relevant document – link.”
11. DO3.1: “Regardless of written policy, does your city ensure alignment between public and private sector constructors, utility companies and connectivity providers to install conduits and connectivity during the construction phase?”
12. DO3.2: “Please demonstrate by sharing the methodology from a recent typical case – link.”
13. DO4.2: “Are there resources or funding available in your city government to improve the efficiency of any digital connectivity roll-out?”
14. DO4.3: “Please describe these resources – funding/budget per year.”
15. DO7.4: “Having reviewed the model policy, will your city work towards adopting the model policy or some version of it in the future?”
16. CPPF2.1: “Please select all model policies that your city will be working on in future stages of the Pioneer Programme (including attending workshops and developing policy proposals).”

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