



## **The Alliance Approach to Smart Cities**

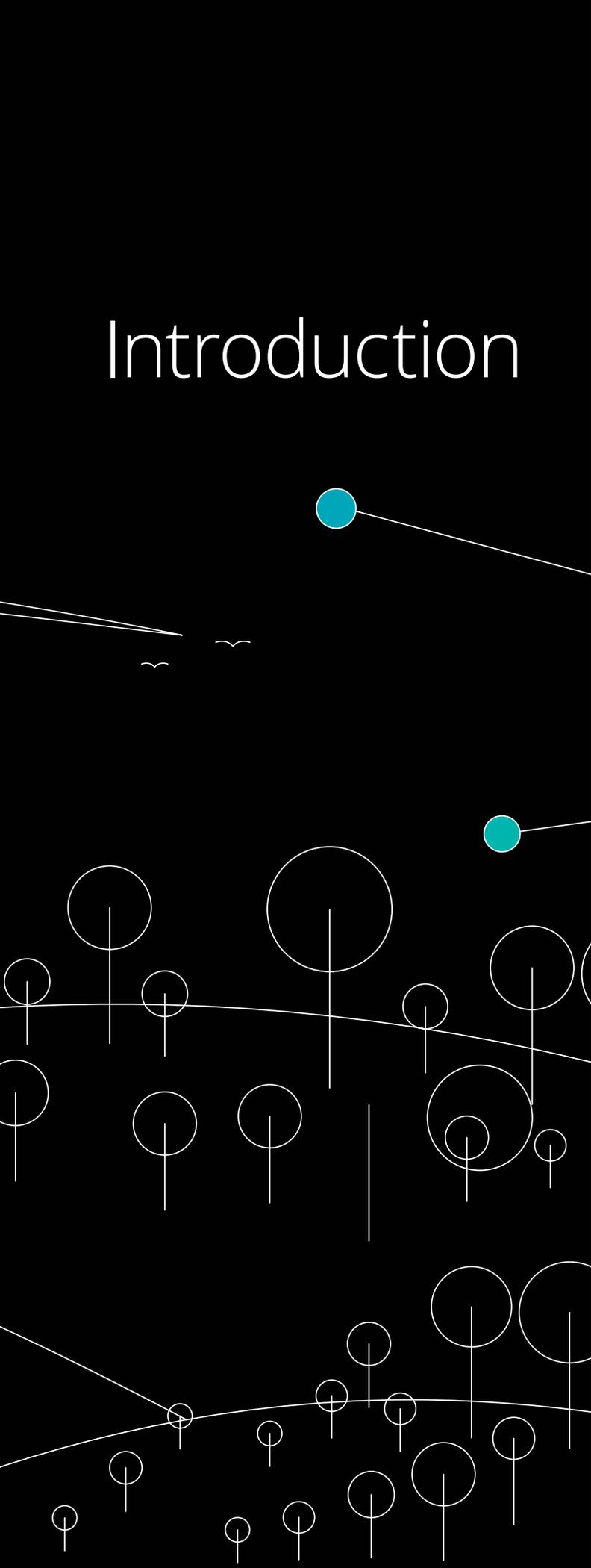
An innovation framework for financing,  
partnership, procurement, and governance

Michael Flynn and Steve Hamilton

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# Introduction



Smart Cities represent a new approach to the urban enterprise, and as such they demand new thinking about how to conduct urban projects.

The technologies behind Smart Cities evolve too fast to accommodate traditional models for municipal projects, which often involve long timelines and complex procurements, and typically require large budgets for capital projects and operations. Nor can many cities these days simply take on the level of responsibility and risk they have in the past to erect new buildings or renovate bridges, especially when those projects incorporate the internet of things (IoT) and other new technology. Municipal budgets are simply too tight, and the new business models—and their returns—are being proven and remain speculative in some cases.

To realize the promise of Smart Cities, governments need a new approach for financing their projects, forming partnerships, procuring products and services, and providing governance. One model we propose is called the Alliance Approach, which offers a way to develop new partnership ecosystems and conduct flexible procurements. It allows municipalities to quickly test and deploy Smart Cities solutions and scale up the ones that provide real benefits.

# The smart cities landscape

Smart Cities combine traditional infrastructure with the disruptive technologies that are transforming relationships between people and the urban environment. These technologies include: automated/ autonomous vehicles; ride-hailing and -sharing services; cloud-based management services for improving municipal services delivery; IoT; and road, water, and lighting systems with embedded sensors.

Arguably, the Smart Cities concept has been around for forty years (with some suggesting its origin as early as the 1970s with the Community Analysis Bureau in Los Angeles). Initiatives have mostly involved large projects led by major, well-known corporate partners and have focused on big technology solutions, including command centers, transportation management systems, and greenfield city developments. For example, consider the challenges and successes of Smart City interventions in Masdar City, New Songdo City, and Rio de Janeiro. Such large-scale urban transformation presents not just a technology challenge, but raises questions around new forms of procurement, financing/funding, and governance.

Governments have treated traditional Smart Cities projects much as they treated any large infrastructure project, such as building a new light rail system or sewage treatment plant. They typically issue requests for proposals (RFPs) with detailed engineering specifications, give the projects large budgets, both for capital expenditures and ongoing operational costs, and assume most of those costs, along with the financial risks. Private sector entities often join the projects as vendors rather than partners.

But the understanding of the nature of Smart Cities needs has changed, even in the last three to five years. Today, for every new, large-scale greenfield

project—such as the SidewalkLabs initiative in Toronto or the proposed Belmont project in Arizona—looking to build a Smart City from the ground up, there are thousands of existing cities of different shapes and sizes (and maturity levels) that require a more iterative, scalable approach. Their challenges are not building anew, in a blank urban space, deploying a new governance and public-private delivery model, but improving upon and repurposing legacy infrastructure and systems such as buildings, transit systems, and others services. These are complex undertakings in any case, but especially when existing governance, procurement, and financial models are designed for 19th/20th Century city needs. When you layer in the core objectives that a Smart City should be economically and socially inclusive, resilient, and environmentally friendly, the challenge becomes greater still.

A key gating issue is that many cities don't have the money required to develop large projects, not to mention the appetite to assume the risk associated with deploying new technologies on the city-scale. So if a city wants to realize the benefits that come with Smart Cities initiatives, how can it proceed?

A couple of recent developments point at a solution. One is the emergence of new, more affordable technologies that cities can use to address some of their most pressing challenges. Another is the rise of entirely new solution types, such as solutions-as-a-service, or interoperable solutions that distribute data across multiple organizations.

During the past decade or two, for example, a city that wanted to improve mobility might spend millions of dollars on an infrastructure-heavy traffic management system. Today, a city might achieve a similar goal by

developing and deploying a cloud-hosted mobility-as-a-service (MaaS) platform using open APIs, based on relatively inexpensive technology, delivered via an IoT-enabled network and smart phone, that lets travelers plan, book and pay for multi-modal travel on demand. This solution would integrate data and services from multiple partners, such as the city's bus system, a ride-sharing service, a state-owned commuter rail service, and commercial airport shuttles. It could create a new market for trip-level insurance coverage, opportunities for real-time retail and foodservice delivery, and all the associated data—travel, purchasing, etc.—could create a new, potentially monetizable data stream for business.

While these new solutions help reduce cost as a challenge, cities contemplating Smart Cities initiatives still face a lot of questions. For example, when you construct a new building for a Smart City (take, for example, a city hall or library), you don't just hire an architect and a general contractor: you also need partners that can integrate technology: sensors and networks for smart lighting and smart HVAC. How do you procure the necessary products and services, especially when the project might involve multiple government agencies and private sector vendors? How should you finance the project, where there are multiple vendors with different risk and return requirements? How can you test a new technology or concept on a small scale and then, if the results look good, quickly extend it across the city or even a larger region? How do you coordinate the activities of all the project partners?

# The smart cities landscape

## The Alliance Approach

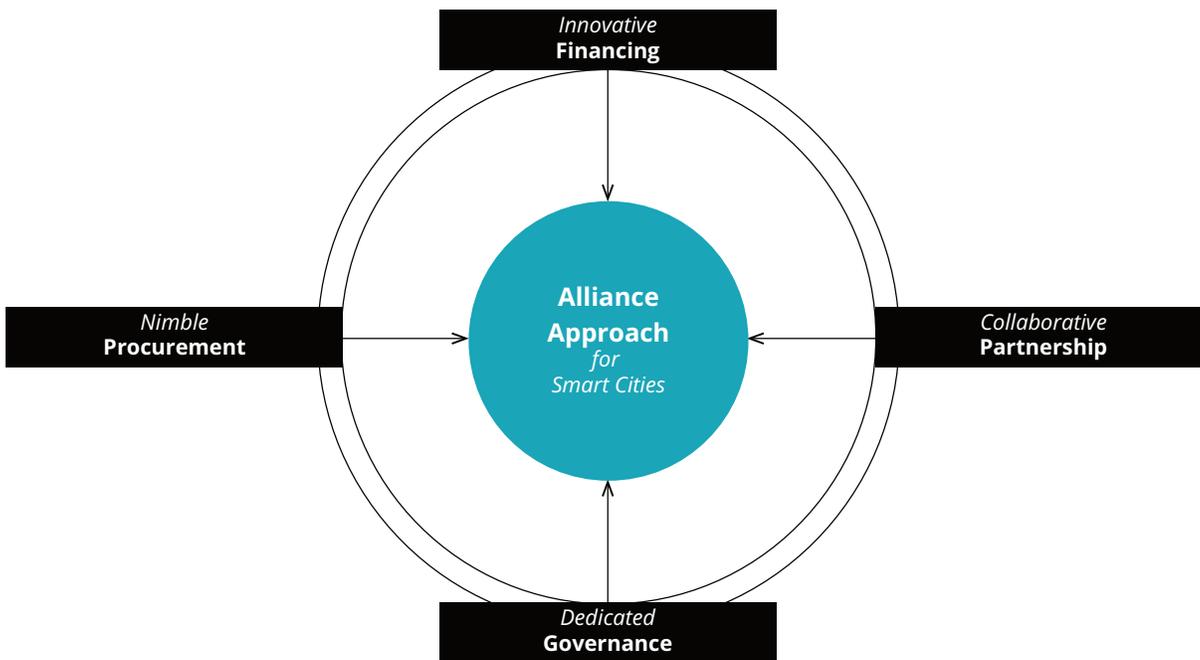
The Alliance Approach offers answers to those questions and more through attention to four areas: financing, partnership, procurement, and governance.

### Innovative Financing

Cities with strong credit ratings can use general obligation bonds or revenue bonds to finance Smart Cities projects. As in traditional infrastructure projects, money to repay a loan may come from user fees such as tolls, from taxes, or from savings produced by the new project. But in an era of tight budgets, some cities don't have the option of issuing bonds.

### Here are some alternatives those cities can explore:

- **Financing from vendor partners.** For example, Cisco has created the \$1 billion City Infrastructure Financing Acceleration Program (CIFAP), which provides debt and equity capital to finance Smart Cities implementations.<sup>1</sup> A city can make a traditional loan arrangement with Cisco, or it can choose "as a service" financing (consuming the technology as a service rather than buying it up front) or revenue share financing, among other options.<sup>2</sup>
- **Revolving innovation fund.** Under this model, the city uses a budget line item or tax allocation to establish a fund. It then uses the fund to finance a new project, reinvesting the proceeds from revenue generated by the use of the asset and/or upon loan repayment (where there is a private partner who delivers the project). In cases where the project starts to save money for the city, those savings go back into the fund, which then finances additional projects. An example in developing markets is the Global Environment Facility, which focuses on grant, advisory, and financing support for energy efficiency investments. Cost savings produced by those investments are reinvested into the fund to support other projects.
- **Mini-bonds.** In 2014, to raise money for cultural and recreational facilities, the city of Denver issued \$12 million worth of mini-bonds. For \$500, any Colorado resident could purchase a nine-year bond, with a maturity rate of \$750, or a 14-year bond, which will mature to \$1,000. The entire offering sold out in one hour.<sup>3</sup> Cities can also use this form of citizen-inclusive participation and crowd funding to raise money for Smart Cities projects.



- **Public-Private Partnership (PPP).** Under this model, the city chooses a private sector partner to, for example, design, build, finance, operate, and maintain (DBFOM) a project, and then transfer it back to the city at the end of a defined period and based on established performance requirements. The city benefits from the private partner's expertise and experience, and the partner makes its money through user fees, other revenues, and/or shared cost savings attached to the project. PPPs have been popular in much of the world for decades, and cities in the U.S. are starting to embrace the concept as well. The tough credit environment facing many U.S. cities, especially less credit worthy cities, and the complexity of deploying new Smart Cities technology systems alongside more traditional infrastructure, favor this approach. In partnership with the City of San Diego, General Electric is upgrading the city's lighting with LED and deploying an intelligent platform that is anticipated to cost \$30 million, financed by GE. City leaders have estimated that it will save the city about \$2.5 million worth of electricity per year, reduce maintenance costs, and provide other benefits.<sup>4</sup>
- **Land-Value Capture (LVC) and Tax-Increment Financing (TIF).** When a city chooses to invest in its own fiber or wireless network, it might lease capacity and/or levy impact payments on real estate developers and other end-users who gain from the benefit (e.g., higher land values) of investing

in a particular location. As business investment increases, land values tend to rise, and so does the tax base. This allows the city, in effect, to monetize the future value of investments today.

- **Guarantees and Performance-Based Contracting.** A city might provide a guarantee on future cost savings or other forms of data monetization for projects with more clearly defined returns/risks. It can then use this guarantee to de-risk investment in other Smart City solutions that are economically and/or socially impactful, but not yet proven financially.

#### **Collaborative Partnership**

Often, a Smart Cities project requires participation from multiple vendors and government agencies. The Alliance Approach provides mechanisms for coordinating the work of all these partners and allowing each one to gain value from the project.

For example, consider Whim, a MaaS application developed in Helsinki. Since 2016, city residents have used Whim to plan and pay for trips involving any mode of transportation, whether by train, taxi, car share or bike share. If no single means of transportation will get the traveler from door to door, Whim plans a trip involving multiple modes. The user either pays a monthly subscription fee or pays for individual trips through a linked account.

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Such a service requires integration of the activities of multiple public and private transportation operators and regulators—pulling together data on routes and arrival times, booking trips as needed, and distributing payments. Many Smart Cities projects require similar levels of collaboration and integration. To create the necessary ecosystem and interoperability, all partners should be fully involved, from the start, in planning and designing the project. And regulators, while assuring public safety, should seek to enable partnership and innovation.

For cities and their partners who make investments in Smart Cities projects agreements could specify added benefits to the partner when a project succeeds. For example, if a city retrofits street lights with energy-efficient LED technology, a gain-sharing arrangement could provide revenue streams for partners. Or, if the retrofit project includes adding wi-fi hotspots, and those hotspots offer a platform for advertising, some of that ad revenue might go to partners.

Whatever agreements a city forges among participants, the project will need a partner to integrate all the components and help the sponsor develop its strategy, business plan, and revenue model. As appropriate, the public sector should ensure that it utilizes Value Capture techniques to maximize its return on investment over time.

### **Nimble Procurement**

When a city issues a request for information (RFI) for a project, it should include an outline for partnership memoranda of understanding (MOUs) and commitments. RFIs should encourage partnership, require the demonstration of technology and solutions inter-operability, and promote business models that focus on shared value creation with the public sector. In contracts with vendor-partners, a city can share project risks through its payment terms, using strategies such as value-based billing and pay-for-performance to tie compensation to the success of the project, where multiple partners' business models should be aligned.

When procuring technology for a Smart Cities project, a city should be sure to investigate contract vehicles available through the state or through regional consortia with other cities in a region. These may provide the chance to test and then scale new technologies without conducting long procurements, or to take advantage of technologies that other jurisdictions have already proven through their own pilots. The Greater Phoenix Region, which includes 22 separate municipalities and the county, as being driven by the non-profit Institute for Digital Progress, are exploring such an arrangement, where multiple cities may join a shared purchasing framework that allows for easy deployment of proven, replicable technologies.

### **Dedicated Governance**

In a Smart Cities project, it's important to move fast and stay flexible, experimenting with promising new technologies, learning from the failures, and building on the successes.

One important key to creating an agile program is to empower a dedicated Smart Cities champion. This person or entity will work directly with leadership across the organization, breaking down siloes to develop a shared vision for planning, value creation and partnership. CIOs, partnerships, and other individuals or groups have taken on the Smart Cities Champion role in cities as diverse as Kansas City, Columbus, and Barcelona. Although no two models are alike, cities should give this champion special authority to expedite procurements and make quick decisions so the city can quickly deploy and test promising technologies, to determine what value, if any, they have to offer.

In a large city that plans to implement multiple Smart Cities projects, may be useful to create a Smart Cities project management office (PMO) to support that designated champion. The PMO's job is to push Smart Cities projects forward. Given the necessary authority, an independent PMO can coordinate the activities of different departments and help navigate red tape, making sure projects stay on track.

# How to get started with the Alliance Approach

The first step in using the Alliance Approach to guide a Smart Cities initiative is to take an inventory of your resources and your needs. What kinds of Smart Cities implementations do city officials want to conduct, and what needs will they address? Once you've made a detailed list, choose your top priorities—the projects that are likely to deliver real benefits to local residents and businesses. This should feed into a financial roadmap and capital investment program, tied to the budget cycle. It should also feature new forms of Smart Cities financing/funding to leverage private capital and expertise in a program that focuses on shared value creation.

Develop your models for governance and partnership. Then delegate authority to a champion. Finally, jump in. Launch a project. Start small, and learn from the results, whatever they are. If the pilot proves a success, scale it up; if not, move on to the next thing.

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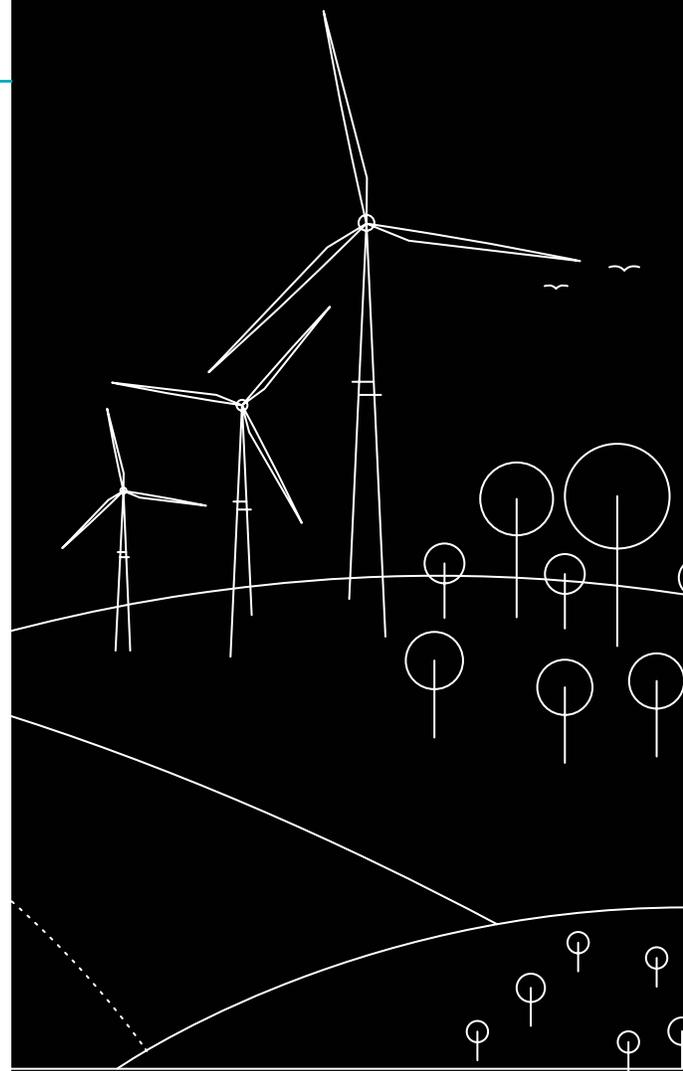
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The Smart Cities concept offers abundant opportunities to deliver new and improved services, and to do it cost effectively. By adopting the Alliance Approach, cities of all sizes can explore promising technologies, determine which ones fit their particular needs, and then embed those new solutions into the fabric of municipal life.

# Endnotes

1. "City Infrastructure Financing Acceleration Program," Cisco, <https://www.cisco.com/c/en/us/solutions/industries/smart-connected-communities/financing.html>
2. "At a glance: City Infrastructure Financing Acceleration Program," Cisco, [https://www.cisco.com/c/dam/en\\_us/solutions/industries/smart\\_connected\\_communities/city-infrastructure-financing-program-aag.pdf](https://www.cisco.com/c/dam/en_us/solutions/industries/smart_connected_communities/city-infrastructure-financing-program-aag.pdf)
3. Alexis Stephens, "Crowdfunding Fans Are Crazy About Denver's Mini-Bonds," Next City, September 12, 2014, <https://nextcity.org/daily/entry/denver-mini-bonds-500-crowdfunding-cities>
4. Bruce Watson, "From Light To Bright: San Diego Is Building The World's Largest Municipal Internet Of Things," October 10, 2017, <https://www.ge.com/reports/light-bright-san-diego-leads-way-future-smart-cities>

# Conclusion



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