



# CitySDK

## Transforming digital service development with harmonized APIs

Cities produce data in many forms and from many sources, and are opening up this data for the talented developer community to use. However, the wide variety of formats makes it difficult to scale applications from city to city.

In order to attract and fully harness the huge potential that developers offer, cities must harmonize the application programming interfaces (APIs) that provide access to their data. Doing so opens up a world of opportunities for developing scalable smart applications and services that will improve the quality of life in urban environments.

But how? Introducing CitySDK APIs. They allow fast, easy development of scalable digital services in three key areas of urban development – tourism, mobility and participation – and beyond.

### Why CitySDK?

- Boost development of smart applications and services that improve quality of life
- Meet citizens' demands for 24/7 digital services
- Engage with – and utilize the skills of – developers
- Create a wider market for apps and services
- Harness the potential of data harmonization and open interfaces
- Make better use of other cities' know-how and resources by implementing proven APIs



## Today's information resources, tomorrow's digital services

The demand for digital public services continues to grow at a time when municipal budgets are tightening. Cities and other public bodies are looking to better engage with the business and developer communities to help them improve cost-efficiency while still ensuring a good quality of life for citizens. Harmonizing the digital interfaces of cities opens up a world of possibilities for inter-city collaboration as well as developer and citizen engagement. It also lays the groundwork for the development of the digital public services of the future.

Although we primarily experience cities through their physical infrastructure – the bricks and mortar that give them their unique character and charm – they are increasingly being designed, managed, and developed with the help of IT solutions. Today, the availability and quality of digital services is playing an ever more important role in determining how well we perceive a city to be functioning.

### **Dressed for success – where CitySDK is already making a difference**

Helsinki – the Issue Reporting API is providing an easy way for citizens to report problems that need attention directly the city's feedback system.

Amsterdam – the Linked Data API is making it easier for people to get around by improving the convenience and availability of public transport data.

Lisbon – the Tourism API is enriching the visitor experience by enabling the provision of tourism-related data via a range of handy applications.

### **City SDK in a nutshell**

City Service Development Kit – CitySDK – gathers tools and knowledge that help cities harness the skills of the developer community and the power of engaged citizens. It helps cities to serve developers in a similar manner to tech giants like Google or Netflix by providing a set of harmonized programming interfaces for developing digital service delivery in European cities. CitySDK began by focusing on three domains: participation, mobility, and tourism.

### **Do you know your SDKs from your APIs?**

An SDK, or software development kit, is a programming package traditionally offered by technology companies that enables the development of applications for a specific platform. Typically an SDK includes one or more APIs, along with programming tools and documentation.

An application programming interface (API) is a set of routines, protocols, and tools for building software applications. APIs make a dataset understandable by applications or websites. For example, APIs are used to make train schedules understandable by route-planning applications. Popular examples include Google Maps APIs for embedding maps on webpages, or YouTube APIs for integrating YouTube functionalities into websites or applications.

### **Developers – what's in it for you?**

CitySDK gives developers access to a host of resources and information:

- Harmonized APIs from various European cities
- Information about relevant data sources within the CitySDK domains
- A wider potential market for their apps with minimum adaptation
- Technology-agnostic APIs
- Code libraries, apps, and platforms



## Empowering the citizens of Helsinki

APIs for issue reporting not only provide cities with a much more efficient way to gather data, but they also increase engagement by providing two-way communication between citizens and civil servants, where people can not only report issues, but also track their progress.

The CitySDK Issue Reporting API allows issue reports, along with images and location details, to be sent from external services directly to a city's feedback system. Based on the most widely used standard for this purpose, Open311 technology, it can be used for reporting a variety of different types of issues.

The City of Helsinki implemented the Issue Reporting API alongside the introduction of its new centralized feedback system, launched at the beginning of 2013. The interface was built to operate between the new system and other platforms in order to enable citizens to send feedback direct to recipients in the city's administration staff. The possibility to send feedback via third-party applications was warmly welcomed, bringing a steady flow of approximately 3,000 visitors a week to the Pitäiskö fiksata "Should this be fixed?" page on the local news site, Metro. Other applications using the API include the Korjaa Kaupunki "Fix the City" app, where citizens can report issues and attach images directly from their mobile devices.

### Where else is it being used?

- Amsterdam, the Netherlands
- Barcelona, Spain
- Lisbon, Portugal
- Lamia, Greece
- Province of Rome, Italy

### What does the API do?

The Issue reporting API enables:

- Submission of issue reports via third-party apps and services
- A standardized reporting protocol with service-request categories defined by each city
- Sending of media and location details along with issue reports
- Searching and follow-up of submitted reports and their status

*Citizens are the eyes and ears of the city. The department of public works cannot know whether a traffic sign has fallen if no one tells them about it.*

**Pekka Sauri**  
Deputy Mayor  
City of Helsinki



Photo: FaceMePLS / flickr

## Keeping Amsterdam moving

The availability of real-time, location-based information through user-friendly services makes choosing the most suitable transport option easier, encourages more citizens to use public transport, and also invites visitors to explore the city.

The CitySDK Linked Data API offers unified and direct access to open transport, mobility, and location data from government, commercial, and citizen sources. Designed to work closely with other open-source projects such as OpenTripPlanner, Analyst, Open311 and OpenStreetMap, the API opens up a multitude of possibilities for linking datasets and providing location-based information to users via a variety of platforms.

Amsterdam, the lead pilot city in the mobility domain, is using the CitySDK Linked Data API to improve both the availability and richness of location-based information. Several apps have been developed using the API, including a simple web app that provides public transport timetable information based on the user's location. The API allows multiple layers of data to be snapped to the base OpenStreetMap layer. For example, based on your GPS location the API can give direct access to relevant data such as multilingual information from Wikipedia, as well as the Official Monuments database and messages on its Facebook page, Foursquare, and many more. The API enables this by making the connection between a location's unique identifier in each of these datasets.

### Where else is it being used?

- Helsinki, Finland
- Istanbul, Turkey
- Lamia, Greece
- Manchester, UK
- Province of Rome, Italy

### What does the API do?

The Linked Data API provides data on things like:

- Accessible bus stops for specified routes or areas
- Traffic information for specified roads
- All hotels in a specified area that have charging stations for electric cars
- All roads in the country that contain a specified word

*“The CitySDK Linked Data API is an important link to the success of open data. It makes developing apps based on open data easier and thus promotes reuse. Moreover, it significantly reduces the costs of running these apps.”*

**Ron van der Lans**

Program Manager, Open Data  
Amsterdam Economic Board



Photo: Alvesgaspar / Wikimedia

## Enabling a whole new experience for Lisbon's tourists

When visitors can easily access information on points of interest, events, and services they are more likely to explore, spend, and recommend. By facilitating the provision of novel digital services, cities can enhance the visitor experience and boost their economies.

The CitySDK Tourism API gives developers access to points of interest, route and event datasets, enabling the creation of innovative tourism services that can boost a city's economy. The API's single point of entry allows cities to be added to an application as long as the same data is available.

In early 2013, Lisbon became the first city to implement the Tourism API. It builds on existing open data initiatives such as the Open Data Lx, which provides access to more than 300 POIs. Applications based on the API give tourists the opportunity to experience the city in a completely new way by suggesting, for example, interesting attractions, themed walks, and nearby services. One example is Spot in Lisbon, which gives tourists access to information on points of interest and events, and features an offline map as well as the ability to add favorite locations and view images of the city's main attractions.

### Where else is it being used?

- Amsterdam, the Netherlands
- Helsinki, Finland
- Lamia, Greece
- Province of Rome, Italy

### What does the API do?

The Tourism API provides data on things like:

- Points of interest in a given city
- Event descriptions for future and past events
- Routes, for example for planning themed walks and other exploration-based activities

*By giving access to open data such as points of interest or events, cities are providing developers with the essential building blocks for the creation of innovative services and apps that can greatly improve the visitor experience.*

**Developer**  
Vodafone BIG Apps  
Lisbon

# Your recipe for success – the CitySDK cookbook

Here are some tips to help you get started with developing an action plan for implementing CitySDK APIs in your city. These are general principles that apply regardless of the APIs you are thinking about introducing. You can also take a look at the Getting Started section of the CitySDK website.

## 1. Familiarize yourself with CitySDK and get references

Don't try to reinvent the wheel. There are plenty of great examples of apps using the CitySDK APIs in cities across Europe and a host of ready-made resources you can take advantage of. Before setting your plan in stone, learn from the experiences of other cities that have implemented CitySDK APIs by talking to our key contacts, learning about their experiences, and checking out some of the services they are providing. What benefits are they enjoying, and what kinds of issues have they run into along the way?

## 2. Showcase the benefits of CitySDK internally

To get your city on board you need to be proactive and start change from within. Begin by identifying the people you need to talk to in order to get things rolling. These are your stakeholders, and can include:

- Senior managers/communications managers in the IT department
- Senior managers/communications managers in the relevant departments (for example, for Issue Reporting this would be the public works department or equivalent)
- Other relevant departments such as finance, planning, and communications

Think about what questions you need to ask. Again, this will depend on the APIs you are thinking about implementing. For Issue Reporting, you'll be quizzing the public works team on what kind of feedback they receive from citizens and in what form, what systems they currently use, and whether there are specific problems an app could focus on – this could be abandoned vehicles, potholes, broken streetlights, and so on.

## 3. Evaluate your city's systems, data sources, and processes

Finding the optimal way to implement an API in your city is crucial if you are to build sustainable solutions. For issue reporting, for example, cities typically have existing systems for handling service requests. To ensure smooth integration, you'll need to identify and evaluate the systems and processes the API will rely on. You'll also need to consider what training

your staff will need to help them get the most out of the API, to integrate it into their work flows, and to enable them to provide support for the developers who are interested in using it.

## 4. Define and plan API integration or implementation

By now you should have identified a key need in your city that can be addressed by using an API, as well as the systems, processes, and people related to it. Use an agile software development methodology such as Scrum, which ensures that a specific department and city official is nominated as the product owner. This will ensure ownership beyond the implementation stage and help tremendously in getting relevant specifications for the APIs you are looking to implement. Where systems already exist, you'll need to set out how the new services will be defined and mapped to the existing ones. If you are using a widely used system, getting other cities on board at this stage provides an opportunity to share costs later if you decide to procure API implementation for the system together.

## 5. Implement, test, test, test – then reach out

Using agile methodologies, early and regular testing is integrated in the development process. Get a first version of the implemented API to the relevant developers so you can start testing your API as soon as possible. It's highly recommended to test with groups who have not been involved in implementing the API because they will spot things that people close to the process may not. Publishing an API for public testing will almost always highlight errors that need to be corrected and new ways of thinking about something.

While implementing APIs and developing applications, huge economies of scale can be achieved by reaching out to developers all over the world via GitHub, Stack Overflow, and other online resources. Small contributions to open-source software stacks help you achieve your goals by eliciting commitment from developers to take your particular situation into consideration when developing new open standards. Finally, when deciding on software licensing regarding your own API implementation, consider the possibilities your code and solutions may offer for other cities and opt for licenses that allow reuse.

## 6. Train your staff

Launching a new digital service is all well and good, but if the city staff is not properly prepared you will run into problems. With issue reporting for example, customer service staff in the public works department should receive training on how to handle and respond to reports using the new system. Any digital service that requires a response or action from city personnel will entail some sort of training.

## 7. Document

Once an API is implemented, create a web page where the technical specification is defined. The page also needs to describe how developers can test the API. Tools like Swagger allow for uniform documentation and offer a standard web-based interface for easily testing a specific API endpoint. In any case, providing a sandbox for testing applications is highly recommended. A sandbox is a self-contained, virtual testing environment that external developers can use to test out their application without impacting on any live services.

You also need to describe how to apply test and production environment API keys and who can apply for API keys.

## 8. Set terms of service and a data license

Define how your API can be used and by whom. When creating your terms of service, it will help to take a look at what the CitySDK cities have done. Put simply, this just means laying down some ground rules for how developers can use the API and what they can do with the data it serves.

## 9. Go live!

When it comes to finally launching your API, it's certainly not a case of "build it and they will come". You need to prepare for and support the launch with adequate publicity. Internal buy-in is critical – when city stakeholders are behind the project it has a much greater chance of success, and they can aid your publicity efforts by spreading the word. Get your endpoint listed on the CitySDK website to make sure it can be found using our discovery service, and tell developers your API exists – taking part in local meet-ups offers the opportunity to publicize your API and provide support.

## 10. Maintain and develop

Going live is just the beginning. Developers are much more likely to invest their time and skills in developing apps that use your API if they can see a commitment to continuous development rather than an API that simply runs down and disappears after a project or hackathon ends. Building service-level agreements encourages entrepreneurial activity based on your APIs. It's also important to get feedback, fine tune and improve – i.e. listen to your developer community and learn from their experiences.

**Ready to kick-start digital service  
development with harmonized APIs?**

**Visit [citysdk.eu](https://citysdk.eu) today!**

## Key contacts

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