Analytical Report n6

Analytical Report 6: Open Data in Cities 2

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Executive Summary

On a national level, more and more European Union Member States are recognising the potential value of Open Data and are acting upon it. Open Data portals are in place, increasingly backed by solid Open Data policies. But it is not only the national level that matters. For a successful national Open Data initiative, the whole publication chain should be taken into account. Cities have an important role to play here. Specifically the larger European cities publish a lot of data on topics such as urban planning, tourism, and increasingly real-time data in the transport and mobility area, such as datasets on available parking spots. Moreover, cities also benefit from the use of Open Data to tackle typical urban challenges such as congestion and pollution, and to improve the quality of urban public services and the interactivity between the local government and citizens.

This report investigates the Open Data initiatives in eight medium-sized European cities, after having analysed Open Data initiatives in Amsterdam, Barcelona, Berlin, Copenhagen, London, Paris, Stockholm and Vienna in a previous report. Cities covered in this report include Dublin, Florence, Gdansk, Ghent, Helsinki, Lisbon, Thessaloniki and Vilnius. All of these cities have Open Data strategies in place, which are not stand-alone initiatives but are often embedded in broader digital or Smart City strategies. Smart City strategies are important drivers for Open Data, as a more connected city and the deployment of smart devices (e.g. sensors on lamp posts to measure traffic density) result in a lot of useful data that can be used to enhance the quality of life in the city. This requires a solid data management system and a focus on stimulating the re-use of this data to tap the value that lies within it. Seven out of the eight cities kick-started their Open Data journey top-down driven, initiated and guided by the political leadership of the city. Over time, these approaches also incorporated more community led initiatives to move forward with Open Data. On the contrary, Ghent has been successfully adopting a bottom-up approach straight from the beginning.

Cities are key players in the data publication chain

Almost all cities have a coordination mechanism in place with the national level. This is important because it facilitates interoperability of different systems and by sharing best practices and experiences, portals can more easily overcome certain barriers. The barriers faced by the portals are very much in line with barriers faced at a national level, with the technical barrier being the most persistent. The dialogue with the national level on the one hand, and partner-cities and institutions on the other hand help the cities to overcome these barriers. Partnerships such as the 6Aika project (Helsinki), the '100 Resilient Cities' (Thessaloniki) and the Bloomberg 'What Work Cities Partnership' (Florence) allows cities to standardise approaches and to exchange best practices.

The cities differ with regards to data available on their portal (from 28 datasets in Gdansk to 1,392 in Florence) and portal features. Most of the portals are not only focused on this 'core task' – publishing data - but also include features aimed at engaging with users, such as news items, event sections and feedback mechanisms. In order to boost awareness on what can be done with the data, cities provide tangible examples and visualisations; some even offer separate city dashboards. Other initiatives to reach out to citizens are often centred around the practical application of Open Data, such as local hackathons and meet-ups. Overall, this report shows that not only Europe's most prominent cities like Barcelona and Paris - as featured in the first report - are maturing on their Open Data journey, but that also medium-sized cities are taking bold steps on their Open Data journey. This is important, because cities are crucial components of the Open Data publication chain.

1 Introduction

The data economy is gaining more and more prominence, with an estimated potential value of 643 billion EUR in the European Union in 2020[1]. Open Data plays an important role in the data economy, and refers to the information collected, produced or paid for by public bodies that can be freely used, modified, and shared by anyone for any purpose[2]. Data can be considered as the new raw material, and has become an essential resource for economic growth, job creation and societal progress. The market size of Open Data is expected to increase by 26,8% from 2017 to 2020 to a value of 75.7 billion EUR in 2020[3]. Data facilitates better decision-making, and leads to more transparency and a more sustainable environment. On a national level, more and more EU Member States recognise the value of Open Data[4]. Open Data portals are being developed and improved, increasingly backed by solid digital policies or specific Open Data policies. But Open Data is just as relevant on sub-national government levels. Open Data can play a key role in solving many of the challenges cities are currently facing, such as urban planning, transportation and the inclusion of citizens in the decision-making process. Open Data can help cities become smarter and more sustainable.

1.1 The role of cities in the Open Data landscape

The Open Data landscape is not a homogeneous landscape. It consists of various stakeholders, with potentially different interests. The Open Data Value Chain[5] identifies the various types of stakeholders when considering the publication and re-use of Open Data. It lays out the steps by which raw data is transformed into value (Figure 1).

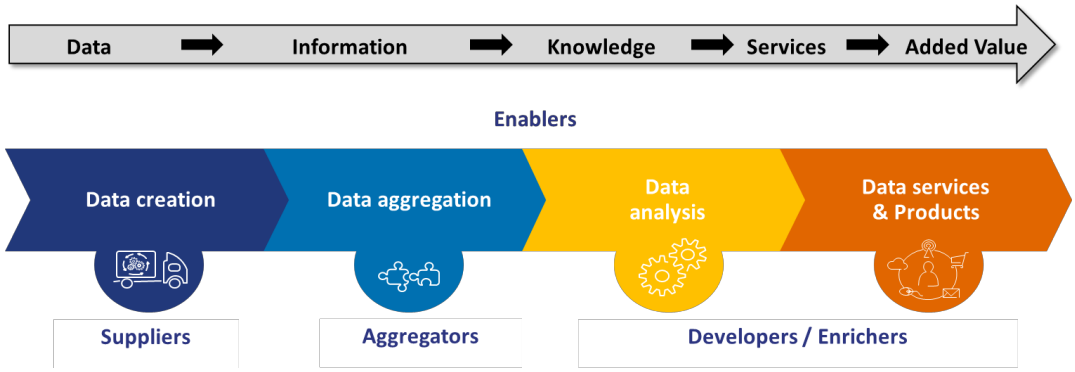


Figure 1 The Open Data Value Chain

When zooming in on the stakeholders involved in the supply of Open Data, recent research shows that more and more European Member States are developing national Open Data Portals, and that existing portals are being expanded with more sophisticated features[6]. These national portals feed in to the European Data Portal, which publishes the metadata of Public Sector Information available on public data portals within European countries. At the same time, several regional and local portals in the Member States feed into the national Open Data portals. Cities have an important role to play here. Not only can they produce Open Data, for instance based on sensors placed on the streets in the city, but they can also benefit from the re-use of Open Data to tackle urban challenges. Examples of Open Data produced at city-level include data on crime rates, urban planning, pollution and traffic density. For cities, Open Data can be an enabler on their journey towards becoming a smart city. Cities are increasingly using ICT and data to solve urban challenges such as congestion and pollution, to improve the quality of public services, to reduce costs and to improve the quality of life in general. Open Data can contribute to these ambitions. The importance of Open Data at a regional and local level was recognised by the European Committee of the Regions, stating that Open Data has the po-

tential to become valuable assets for citizens, businesses and public authorities[7]. This report explores how eight European cities are embracing Open Data to overcome contemporary urban challenges.

1.2 Method and selection

This report is the second report from the European Data Portal focusing on Open Data and Cities. The first report published in 2016[8] highlighted eight large capital cities in Europe: Amsterdam, Barcelona, Berlin, Copenhagen, London, Paris, Stockholm and Vienna. To better understand Open Data developments in other types of cities, this report focuses on Open Data in medium-sized cities in Europe that have been successful in using Open Data to solve specific city problems, to improve transparency and to close the gap between local government and citizens. Eight cities were selected based on the following criteria:

- **Inhabitants**: cities with a population of 250,000 – 1,500,000 inhabitants were selected.
- **Geographical spread**: cities from eight different countries across the European Union were selected to ensure a solid geographic balance. Countries covered in the first Open Data and Cities report were excluded from the selection.
- **Open Data Portal**: cities with an Open Data portal were selected.

Lastly, EU Member State representatives could recommend a certain city within their country. This approach resulted in the selection of eight cities (Figure 2).

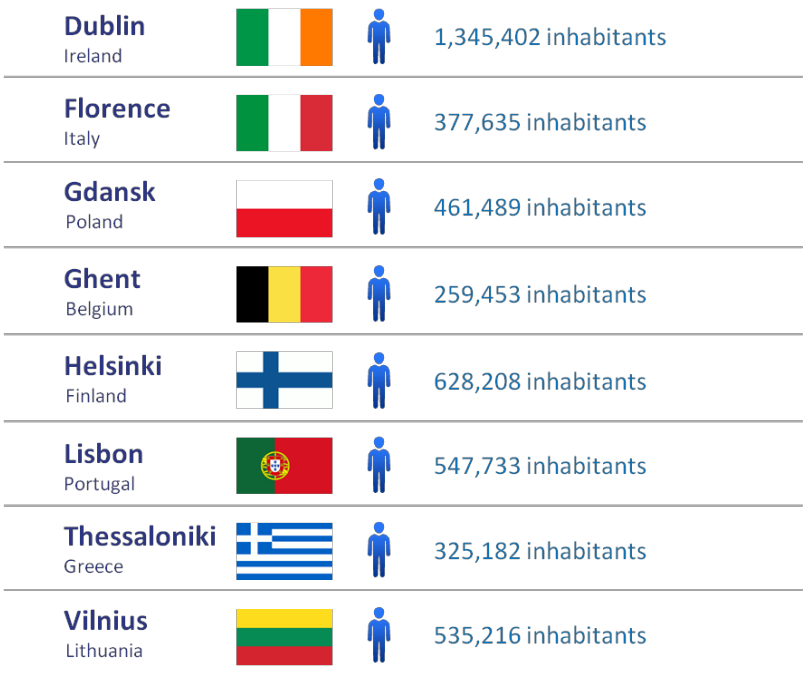


Figure 2 Selection of cities featured in this report

To learn more about Open Data developments within selected cities, in-depth interviews were conducted with representatives of the teams in charge of Open Data within the cities. These interviews were conducted in February-March 2017. Input on developments on city-level was also gathered through regular bilateral interactions with Member States. To add to the insights gathered through the interviews and bilateral interactions, broader scoped desk research was conducted. To complement the limited academic literature available on this topic, research also focused on sentiment analysis and discussions conducted with the Open Data community during conferences and workshops. City representatives interviewed were equally asked to validate the findings.

2 Open Data strategies

Having an Open Data strategy in place is one of the most important aspects of creating and sustaining a successful Open Data portal. Before starting to publish any Open Data, it is important to have a strategy in place that defines the goals and sets the ambition. Emphasising the importance of a legal structure and defining standards for the publication of Open Data in this strategy contributes to the availability and accessibility of data. By providing data holders with a standard licence, data providers can include this licence in their metadata making sure it is recognised by both data providers and data users. In June 2016, the EDP published a report on Open Data and Privacy[9] which offers further guidelines and recommendations that can help promote the utility of data while ensuring data controllers' obligation to respect the right of data subjects to personal data protection. Further guidelines on how to build a successful Open Data Strategy can be found in the EDP Guidelines for publishing Open Data[10] (figure below).

Figure 3 High-level overview of how to build an Open Data strategy

This section will further explore the existence of an Open Data strategy, the importance of national coordination and the kind of approach adopted in the eight cities featured in this report.

2.1 Open Data strategy

All eight cities featured in this report have a specific Open Data strategy. They expect that an Open Data initiative contributes to the quality of life in the city, that it makes citizens responsible for their environment and that it brings citizens, communities and the local government closer together. Saving money was a key objective of the Open Data strategy in two of the cities. When looking more closely into the different city strategies, different cities seem to have different ideas on how to realise those objectives.

For all cities investigated in this report, the most important aims are to drive efficiencies through connected networks, connected infrastructure and a connected city and to increase transparency by allowing open access to the city's data and statistics. In Dublin this is being realised via a national Action Plan and a Public Service Open Data Strategy[11]. Specific guidelines, instructions and best practices are provided in the Open Data Publication Handbook[12] and the Open Data Ireland Best Practice Handbook[13] . Florence covers Open Data in its Digital Florence Manifesto - a benchmark of smart city initiatives in which the main digital assets are to be shared and promoted in the city with other public service providers as well as the Florence Smart City Plan (STEEP)[14]. The Openness Policy Gdansk[15] focuses on sharing data collected by the city and the use of new technologies and promoting transparent governance by the gradual release of new collections of public data.

Ghent aims to be a "City of People" – a city in which smartness is defined by the well-being of its citizens; which is also a top priority in the Open Data Strategy of Helsinki[16]. The Ghent Digital City[17] is one of the priorities[18] of the city, adopting the principle of digital inclusion. The Open Vilnius strategy[19] is based on saving money, helping residents adopt more sophisticated solutions, sharing and help install the practice of municipal institutions, municipalities or other institutions. This is done through the Rules[20] for the Vilnius City Municipal Government to open up data. Thessaloniki's Digital Strategy[21] aims at strengthening the local economy by offering more digital services. Furthermore, Thessaloniki is a member of the 100 Resilient cities[22] and has a Resilient Thessaloniki strategy which has a data-driven Thessaloniki as one of its main pillars.

Figure 4 Elements of an Open Data policy

2.2 National coordination

National coordination is important for a successful Open Data strategy because the national level can introduce national guidelines and common approaches to be used by other layers of public administration. This does not only allow different systems to work more smoothly together, it can also help smaller communities with fewer resources in their Open Data journey. National coordination is present in seven out of eight cities investigated in this report.

Seven portals featured in this report are harvested by the respective national Open Data portal. The Lithuanian Open Data portal is harvesting the GitHub portal of Vilnius. The national portal has its own Open Data account in GitHub and can directly upload datasets. In June 2017, the national portal will move to CKAN and will then be harvested by the European Data Portal. In Poland, the CKAN platform is currently used by several Polish cities as well as the national Open Data portal and will facilitate further data integration in the future. Thessaloniki is working with the Greek Open Source Society to build interoperability standards to have more standardised datasets from local administrations. A national framework exists in Greece, but the implementation is sometimes problematic. The introduction of the Open by Default principle into Greek law in 2014 has helped further national coordination efforts in further standardisation. City data is harvested by the national portal, but updates are done manually by the city portal itself. In Ireland, regular meetings take place with the different Open Data portals to see what the national government wants the local government to do next.

Also in Finland regular meetings take place between the national and city Open Data portals to discuss potential issues and ways forward. The national portal harvests the metadata of the Helsinki Info Region service on a daily basis. The Ghent Open Data Portal is harvested by the Flemish Open Data Portal which is, since recently, harvested by the national Open Data Portal. Regular meetings take place between different portals in Belgium which are chaired by the national Open Data Portal.

Although different cities in Flanders are active individually, the Flemish Open Data portal is responsible for further regional coordination within Flanders.

The Italian national Open Data portal is working on a unique approach in data harvesting for geodata and non-geodata (CKAN API). The presence of a consolidated European-level and national-level standard for geodata (as defined by INSPIRE[23] and RNDT[24]) is helping the adoption of a unique reference for data modelling among the different Italian public administrations. The Portuguese Open Data movement is still in the beginning phase which means that no formal partnerships with any city or the national level have been established, however, informal meetings are taking place with both the national level and cities such as Porto to enhance further cooperation and share experiences. Collaboration with local public and private partners has resulted in 11 different entities sharing their Open Data on the Lisbon Open Data portal. This number is expected to increase in 2017.

2.3 Top down and bottom up approach

When looking more closely at the approach taken in the cities featured in this report, most Open Data strategies were initiated by the political leadership of the city and therefore used a more top-down approach. Except for Ghent, the other seven cities received a strong commitment from their political leaders from the beginning, evolving into a mixed approach once the basics were in place. Where some cities have enjoyed working with Open Data for several years now, and understanding better what data re-users need the most, a bottom-up approach is now used as well.

In Florence, the mayor wanted all public data to be opened, regardless of whether public officials preferred data to remain closed. Thanks to the strong political commitment of the city to be smart[25], the Open Data initiative evolved and today it includes bottom-up characteristics as well, involving the local community more. In Lisbon, a city Open Data principals' letter[26] started the Open Data movement. Now, with the support of the local government, the city Open Data portal is working with different city partners such as city services, universities, companies and user communities.

The same situation can be seen in Dublin. At first, the strategy was developed by the national government level and local government level which was then incorporated by local authorities who were instructed what approach to take. The aim was to identify datasets that each local authority all over the country had, and convert them to the same format and publish them. It started with budget data, then fire stations data, police stations data, etc. They had to build up a repository for the whole format. The local government Open Data project team and Dublinked would coordinate those meetings. Now, the community is much involved as well. In Helsinki, the strong city policy on Open Data was the driver behind Open Data in the city. Nowadays, the highly active Open Data community in Finland 'Open Knowledge Finland' is working closely together with the public sector and has been a strong partner in helping the Helsinki Region Infoshare move forward.

The Open Data movement in both Thessaloniki (due to its hierarchical decision making system) and Gdansk started with the public administration. Thanks to the organisation of several workshops open to the public, citizens and the community have become increasingly important for the further development of Open Data usage in both cities. Vilnius did not have a strategy in the beginning. In 2015, the mayor asked one of his software developers who assisted institutions with Open Data at times, to have Open Data as a focus area. Since then, this has transitioned into a clear system and procurement. Whereas in Ghent, the Open Data movement started with the university of Ghent and some active students asking the mayor about Open Data. Together with the local community and Open Knowledge Belgium, the hackathon 'Apps for Ghent' was created in 2011.

In order to be successful in Open Data at the city level, all eight cities featured in this report have built an Open Data strategy. Some portals are in a more advanced phase than others, meaning they have been able to show that their strategy works and that the cities have become more transparent, more efficient in how they are run and in providing services to their citizens. Having a good national coordination is an important aspect in this regard because it helps a smoother interoperability of different systems. In addition, by sharing best practices and experiences portals can more easily overcome certain barriers. In the beginning stages, strong political leadership is important to get Open Data started and provide guidance (figure below). Once the portal has been created and more citizens in the city have started using Open Data, community led initiatives appear to become a strong driver in moving the Open Data movement forward.

Figure 5 Top-down versus bottom-up approaches

3 Open Data portals at city level

To ensure data is easy to find, access and download, data portals require a number of features to be set up, but it is equally important to be clear about where certain data can be found. Do the cities have all the Open Data available on one portal? Section 3.1 zooms in on the portal structure. Section 3.2 presents some of the features available on the eight Open Data portals, and section 3.3 describes some further portal characteristics.

3.1 Portal structure

When looking at the online presence of cities, a variety of websites and portals is found in the eight cities. In addition to an Open Data portal, cities tend to have several more web portals. on top of more general city websites (e.g. for citizen services or tourist information), the eight cities investigated have smart city portals, Open Data portals for publishing geospatial data, and specific Open Data portals. In Helsinki for instance, the Helsinki Region Infoshare (HRI) portal[27] publishes all Open Data from the city of Helsinki, including geospatial data. HRI co-partners with some other portals of the city of Helsinki, such as the portal for developers[28] and the portal[29] outlining the digital Helsinki programme. Despite the multitude of online presences related to different digital themes, which is also the case for the other cities under consideration, all cities have a dedicated Open Data portal in place.

These Open Data city portals are important players in the national Open Data publication chain, as almost all city portals (except for Lisboa Aberta[30]) feed into their respective national Open Data portals. This process is most often automated, although in Vilnius the harvesting is done manually. In turn, the national portals feed into the European Data Portal. This process is outlined in Figure 6.

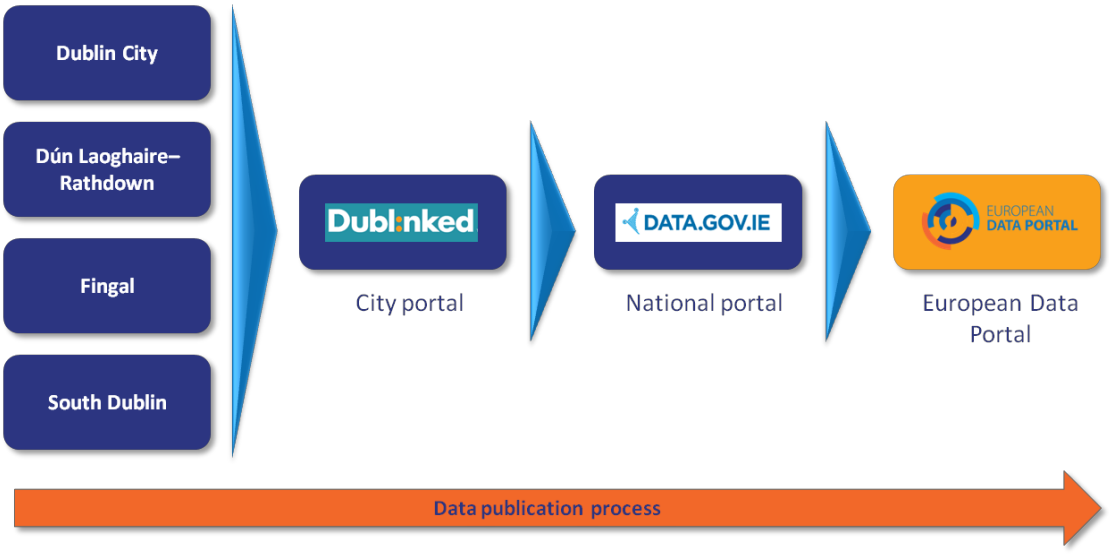


Figure 6 The role of cities in the data publication process

This process is not always straightforward. Cities may have to deal with several administrative layers, e.g. the municipality, the metropolitan area and the province. This is for instance the case in Florence, where the portal of the metropolitan area[31] and the city of Florence co-exist. Moreover, the city portal not only feeds into the national portal, but also to the provincial portal of Tuscany[32].

The sharing of Open Data between these various stakeholders in the data publication process is facilitated by the use of a common vocabulary. This makes the process more efficient and better un-

derstandable for all actors involved. The DCAT Application Profile (DCAT-AP)[33] is the common metadata standard for describing public sector datasets in Europe. From this perspective it is promising that, among others, cities like Dublin, Florence, Lisbon and Ghent have adopted this standard.

An interesting development is that cities are developing digital dashboards on which they combine and showcase both Open Data achievements, Smart City initiatives and information about digital public services. Among the eight cities investigated, examples of cities where such dashboards are found are Dublin[34], Lisbon[35], Vilnius[36] and Helsinki[37]. These dashboards function as a central hub, from which users are being redirected to different digital topics and/or other portals (Figure 7). These dashboards also showcase Open Data use cases and Smart City pilots. References to Open Data portals are usually provided. These visualisations provide more context to the data, and help citizens understand what Open Data is about and what the benefits are. These benefits are more easily understood by using dashboards then by providing the raw data itself. Thessaloniki is currently in the process of developing such a dashboard, with the aim of fostering open government by visualising KPIs.

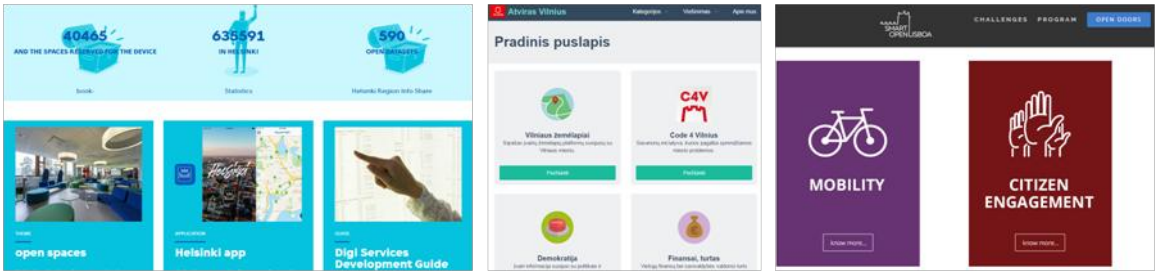


Figure 7 The city dashboards of Helsinki, Vilnius and Lisbon

Some of the cities investigated have integrated geospatial datasets in their Open Data portals (Florence, Ghent, Lisbon, Helsinki, Dublin), while others (Vilnius and Thessaloniki) have a separate portal specifically for geospatial data. Thessaloniki mentioned to further develop their portal in 2017, and also foresees the integration with their GIS platform to make geospatial data available on their city portal. The advantage of integrating geospatial data in the city portal is that it offers visitors a single point of access to all city data.

3.2 Portal features

The portals investigated by this study differ in terms of datasets available (see section 3.3) and features included in the portal. It varies from basic portals providing only the data, a brief news section, a FAQ section and contact details to more advanced portals offering an API, featured datasets, extensive feedback opportunities, social media details and highlighted Open Data use cases.

Currently, all eight cities analysed offer an Application Programming Interface (API) to access their data – although the Gdansk portal is only partially API accessible. An API allows other tools, such as machines, to access the data on the portal. It allows for instance another portal (regional, national or even the European Data Portal) to harvest the datasets automatically from a given portal and offers links back to the datasets on the original portal. Having an API eases the re-use of data from the portal.

Six[38] out of the eight portals have a news section available on their Open Data portal. Such a feature not only helps drive traffic to the portal, it also raises awareness about the benefits of Open Data and shows what can be done with particular datasets. It also stimulates unique visitors to become return-

ing visitors, resulting in more engagement with users. The same accounts for promoting Open Data-related events and for publishing use cases on Open Data portals. Use cases are practical examples of how Open Data is being re-used (Figure 8).

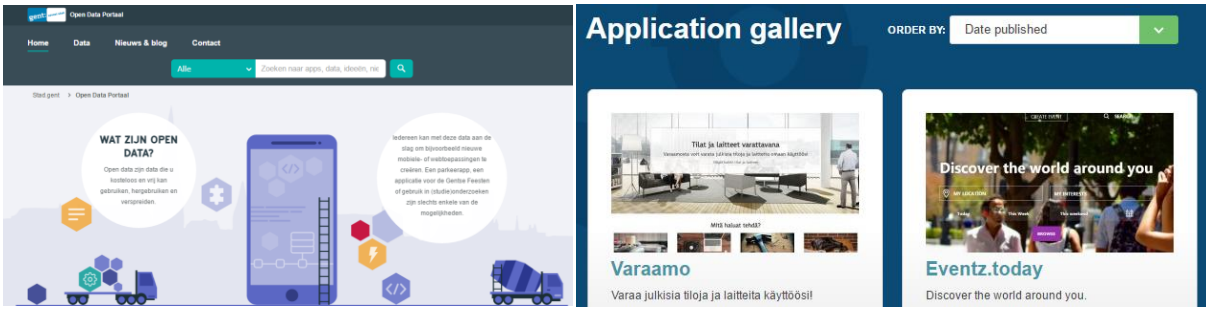


Figure 8 The new Open Data portal of Ghent (launched March 2017) and the use cases gallery on the HRI portal[39]

Feedback from users contributes to the usability of data portals. A best practice in this regard comes from Dublin, which offers extensive feedback opportunities. Users can not only share their data or request particular data, they can also send questions by submitting a form or interact with the team managing the portal via social media or by using the general contact details (Figure 9). Gdansk can be considered as a best practice with regards to openness about the team managing the portal: all their names and responsibilities are provided on the portal.

Figure 9 Feedback functionalities on Dublinked.ie

3.3 Portal data

When assessing the number of datasets offered on each Open Data portal, substantial differences exist between the portals. The portal of Florence offers by far the most datasets (1,392), while the portal of Gdansk offers 28 datasets[40]. All of the portals assessed have organised their data around certain data categories, ranging from five categories in Vilnius (Finance, Transport, Education, Democracy, Processes) to 19 data categories in Florence.

- Florence: http://opendata.comune.fi.it/ - 1,399 datasets
- Helsinki: http://www.hri.fi/en/ - 603 datasets
- Ghent: https://data.stad.gent/ - 579 datasets
- Lisbon: http://dados.cm-lisboa.pt/ - 366 datasets
- Dublin: https://data.dublinked.ie/dataset - 251 datasets
- Thessaloniki: http://opendata.thessaloniki.gr/ - 74 datasets
- Vilnius: http://atviras.vilnius.lt/ - 56 datasets
- Gdansk: http://otwartygdansk.pl/open-data/ - 28 datasets

Overall, cities have not yet identified priority domains based on specific assessments, nor do they base the release of particular datasets on the needs of the user. By defining priority domains based on user needs, data publishers could dedicate specific resources to improve the quantity and quality

of these domains. But there are exceptions. Ghent for instance, has a particular focus on real-time data. As a result of users demanding recent and real-time data, Ghent is now the first city in Belgium offering 12 real-time datasets in the Transport & Mobility domain. Based on portal statistics most cities do have insights in the most popular domains (Figure 10). In Dublin for instance, the most popular datasets are visualised on Dublindashboard.ie. Helsinki and Florence indicate that geodata is the most used data domain. On the contrary, Lisbon does not know who is using their data and which data is most needed.

Figure 10 Most popular datasets Florence

Not all cities have applied a clear Open Licence to the Open Data they are providing[41]. This hampers the re-use of the data, as it may lead to uncertainties on the side of the re-user on whether the data considered is free to access, use, modify and share. Only data which is shared with an Open Licence becomes Open Data. Thessaloniki for instance uses the Open Data Commons Open Database License (ODbL)[42].

Figure 11 Regions & Cities data is often combined with three other data domains - findings from EDP re-use report 2017[43]

4 Barriers encountered by the cities

A recent EDP report on Open Data and Barriers[44] shows that although the majority of the EU28+ countries has successfully developed a basic approach to address Open Data, they are at the same time struggling with several barriers, hindering them to move forward with Open Data. This means that a part of the economic value that lies within Open Data remains locked. This section explores which barriers apply at a city-level: do the challenges on a national level equally apply to the city-level, and are there specific challenges cities are facing regarding Open Data?

Barriers faced by portal owners on a city level are very much in line with the barriers faced at a national level (Figure 12). But when zooming in on the barriers that apply at a city-level, it appears that some barriers are more persistent than others across the cities investigated. A major challenge appears to be the technical part of publishing Open Data, mentioned by six cities. A big concern is the quality of data and the automation associated with uploading and updating datasets. One city mentioned that the legacy of systems results in not being able to automate data publishing and not being ready to export data in open formats. Poor data quality is also related to the lack of skills of the people working in the departments (e.g. local municipalities) where the data is produced. This results in data not being complete, not being correct or not being updated on time. This is very often still a manual process, just as the maintenance of data.

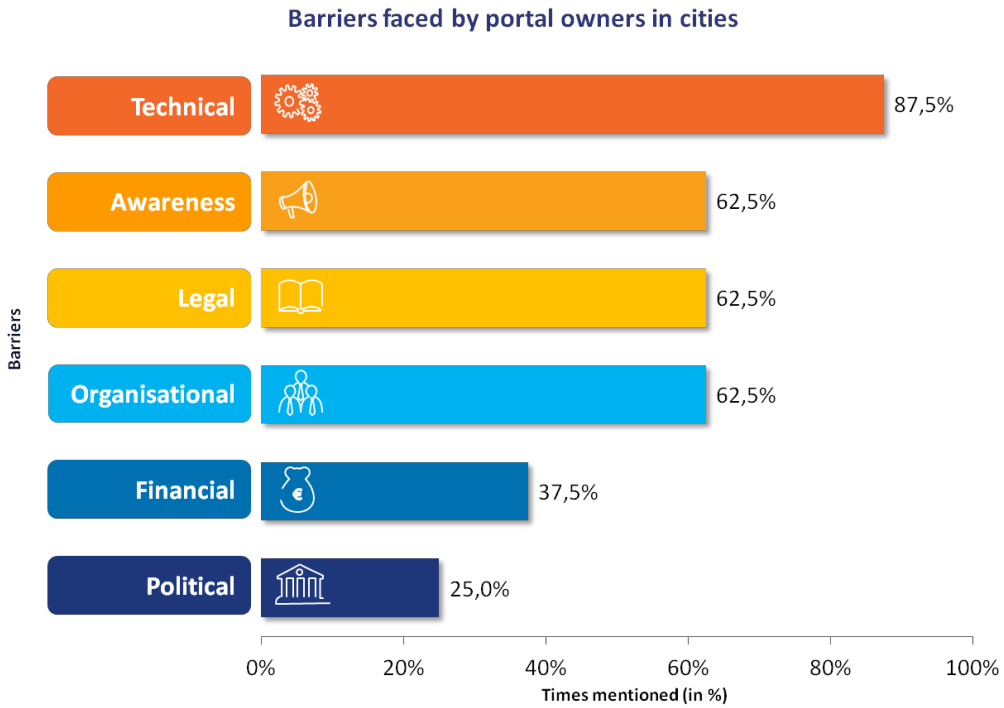


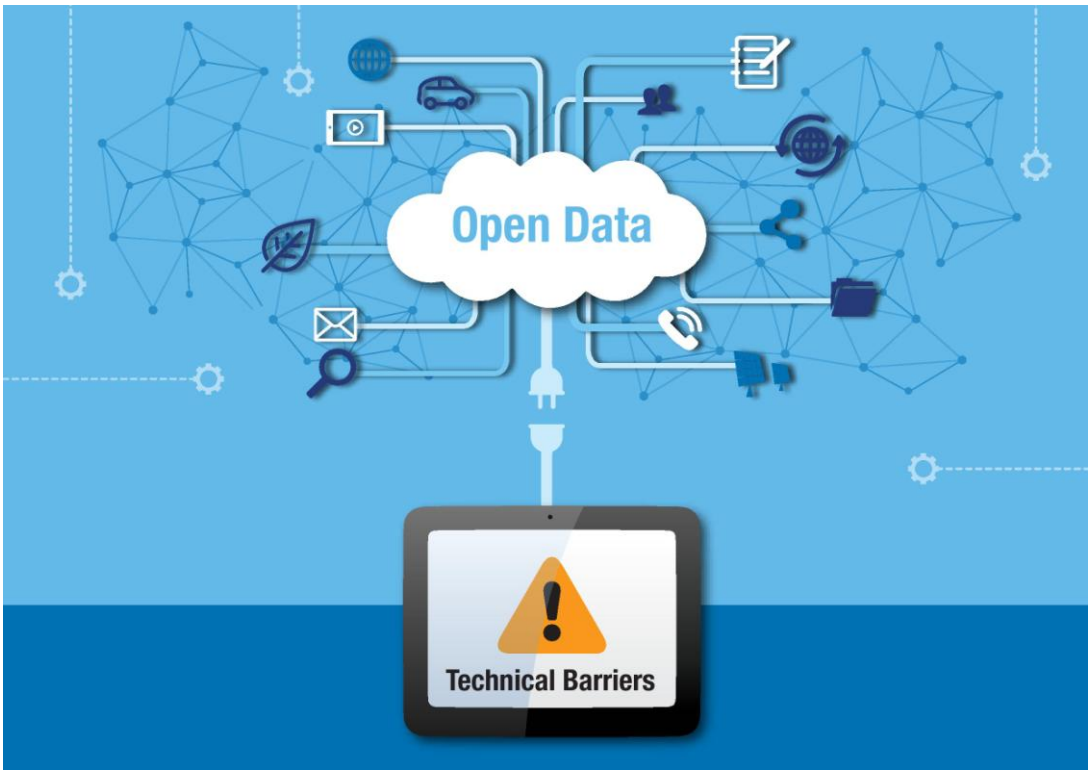
Figure 12 Barriers for portal owners

Cities suffer from a lack of awareness on the benefits of Open Data: they find it difficult to convince data holders to release their data. As an 'Open by default' approach is not yet common in the cities investigated, data holders need to be convinced about the added value of releasing their data. But also on the side of the data user, the awareness about the value of Open Data needs to be improved. The city of Florence has adopted a bottom-up approach to improve awareness: "*a cultural revolution is needed. Citizens generally don't know what Open Data is, nor do IT companies. We need to work on this. That is why we started working with schools, talking to high school students and start-ups to*

educate them on Open Data". Legal aspects constitute a barrier for five cities. More specifically, they perceive the fear of data protection issues as a barrier in publishing data.

Organisational barriers play a role in four of the cities under consideration. Not only is capacity in terms of human resources sometimes an issue, but also a lack of synergies, interoperability between departments and streamlined data management plays a role. It is not always where and how which data is produced or stored. Different kinds of government agencies exist next to each other, on regional, municipal or city level. In Florence for instance, the data that is most needed does not come from the municipality. Pharmacy data is often requested, but it remains difficult to obtain the data, let alone in a structured format. Another high-value dataset in Florence is real-time street cleaning times, where datasets produced by the external authority are not available in machine-readable format. It is ongoing work with the waste management utility to improve the quality and to align datasets and cartographies, and with the Pharmacies Authority to improve the availability and quality of data.

Although some cities face financial barriers to open up data, this is not the case for all cities. Florence for instance indicates that money is not an issue, because cities can apply for a broad range of national and European funding. In Dublin money was not an issue either, as in Ireland there is a specific Open Data unit within the national Department of Public Expenditure and Reform which engages with Open Data projects all over Ireland: the Local Government Open Data project theme. They roll out Open Data initiatives over local authorities in Ireland, also providing them with financial resources.



5 Awareness and citizen engagement within cities

The previous chapter highlighted that a lack of awareness is still one of the barriers faced by portal owners. A lack of awareness plays a part on both the side of the data publisher and the data user, as data publishers are not always aware of the relevance and potential of Open Data, and users are not always aware of the Open Data available. This section highlights what cities are doing to boost the knowledge of the benefits and availability of Open Data, primarily on the users' side. Section 3.2 already underlined that six out of the eight portals have a news section to engage with users and to boost awareness.

5.1 Strategy to reach citizens

The eight cities all recognise the importance of involving citizens for a successful Open Data initiative, with the purpose of making them more aware of the benefits and potential applications of Open Data. Most cities do not have a specific documented strategy only for involving citizens, but have integrated the aim of raising awareness and involving citizens in a broader digital strategy. For instance, Thessaloniki's Digital Strategy commits to provide four courses a year, free of charge, to educate citizens on general eSkills, and more specifically on Open Government and Open Data. This should improve the skills and capacity of citizens to use Open Data.

The initiatives to reach citizens are often centred around the practical application of Open Data, providing tangible examples of what can be done with the cities' data. Recurring events such as the Data Dive Ghent and Helsinki Loves Developers are open meet-ups, facilitating the dialogue and cooperation between publishers and re-users of Open Data. Portals also seek collaboration with universities, for the organisation of events, to educate the students on the topic of Open Data and to gather feedback on the portal. This is seen in Dublin, Ghent, Florence, Lisbon and Helsinki. Another way of reaching citizens is the use of social media, which is not often mentioned by the cities. The city of Helsinki however makes extensive use of social media, especially when new data is released.

The city of Dublin deserves special attention with regards to involving citizens, as they participate in the project 'Route to PA[45]', which is a European project focused on citizen engagement around Open Data. Furthermore, the bottom-up approach of the city (see section 2.3) is built into the Dublinked site. The portal allows people to request datasets and to suggest new data, and it also offers visualisation tools to contextualise the data, making the re-use of Open Data tangible. Visualisations help understand what Open Data is about and what its benefits are. According to the Dublinked portal owner, citizens appreciate the dashboards created with Open Data rather than the Open Data itself. Dublin's strategy to reach citizens seems to be successful when looking at the user statistics on the portal. The portal receives around 1300 visitors each month, with a peak of over 1500 visitors in March 2017. Further statistics provide user information on total number of datasets, most popular resources (all time and in last 30 days), top key words, publication of new datasets, website & usage metrics and compliance with the data.gov.ie technical framework. The Florence Open Data Portal provides slightly different statistics. This portal provides further information on how many datasets per theme are updated automatically, which datasets have been most downloaded per month, accesses from which countries and how many datasets per format have been published each month. The remaining six portals do not yet specify specific user statistics.

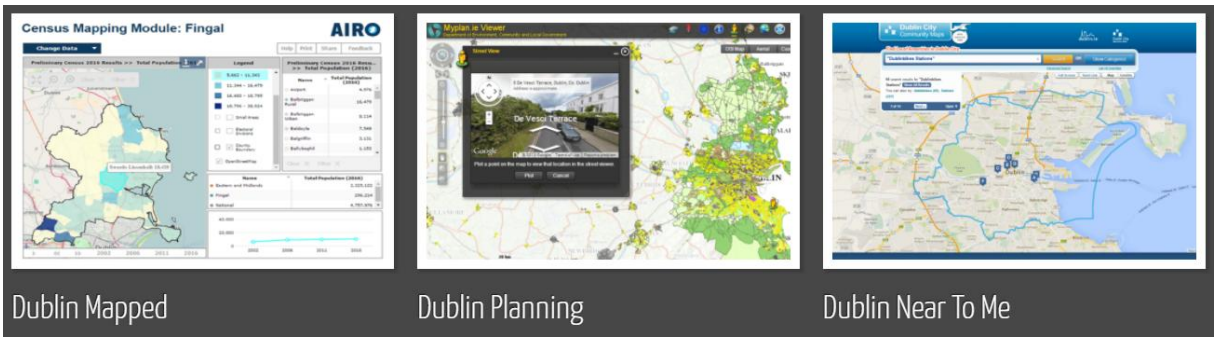


Figure 13 Visualisations on Dublinked

An important element of the cities' strategies to reach citizens is the organisation of events. The following section describes the kind of events being organised by the cities.

5.2 Events

All eight cities organise events or are involved as a partner in Open Data events, like hackathons and meet-ups, to stimulate awareness on the users' end. These events differ in scale and reach, ranging from city-specific hackathons making use of city data such as Apps for Ghent and HackaccessDublin to national events held in the particular city. Crowdsourcing ideas, as being done in for instance Lisbon ('Open Data Crowdsourcing Day') and Thessaloniki (launch of three crowd sourcing competitions) is also a popular way of driving user engagement. Specifically the local events help to engage with users and to gather feedback on the data provided. The cities of Dublin, Florence, Helsinki and Lisbon are also organising specific events (e.g. workshops) to drive awareness among all tiers of the data publication chain. Lastly, Thessaloniki ran an online public consultation to find out how they could make the portal more user-friendly.

The different methods deployed by the cities to reach – or to engage with - citizens to raise awareness on the topic of Open Data are summarised in Figure 14.

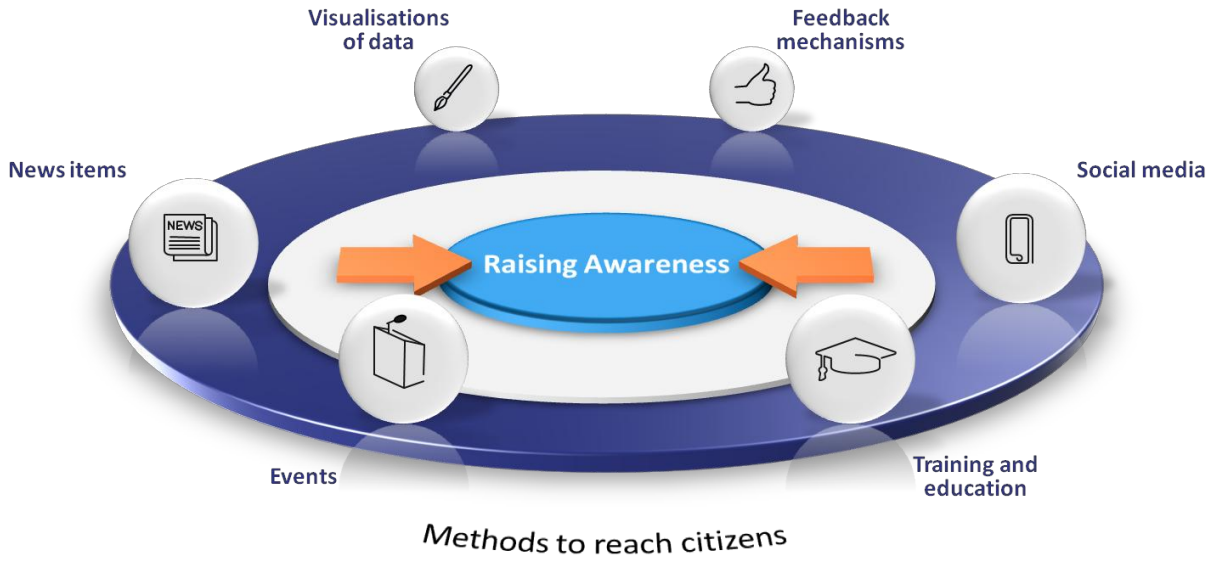


Figure 14 Methods to reach citizens as deployed by the eight cities

6 Impact of Open Data

Measuring the impact of Open Data is important because it shows in which areas, be they political, economic or social, the benefits of a city's Open Data policy are most significant. But how can this impact be measured? This section provides examples of the impact Open Data has on cities and how it can be measured. It also showcases city-level success stories.

6.1 How to measure impact?

The social impact can be measured by looking at aspects such as environmental sustainability, the inclusion of marginalised groups in policymaking and accessing governmental services. For example, Florence is working together with Bloomberg and the Johns Hopkins University from Baltimore to measure the impact and results of the city's Open Data approach. They intend to set up specific KPIs for citizens and businesses. Via surveys they can find out how useful Open Data is for different types of citizens, such as students. Ghent is not specifically measuring impact, but thanks to the small size of the city the Open Data team has a good relationship with the local data ecosystem and is always informed when Open Data is used to build applications, allowing them to get more qualitative insights in the impact. An example is 'Gentse Feesten'[46], a festival which attracts half a million visitors each year. Every year, several open source applications are developed showing the programme and other activities which can be downloaded free of charge. While an app in Vilnius - Tvarkau Vilnių[47] - allows citizens to submit problems they see around the city, which are then displayed on a public map and passed to appropriate institutions.

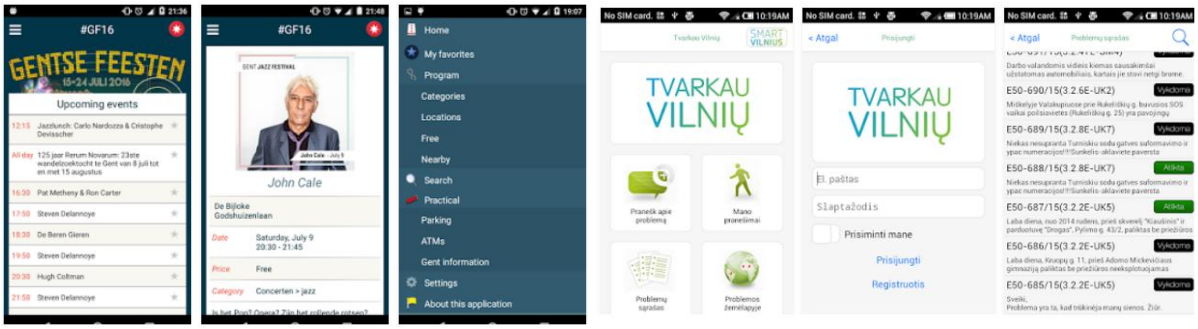


Figure 15 Gentse Feesten app in Ghent and Tvarkau Vilnių in Vilnius

The economic impact of Open Data can be measured by an increased market size, job creation, cost savings and efficiency gains[48]. In Vilnius, thanks to using GPS for snow ploughs and publishing that data publicly, this led to the revelation that the municipal entity in charge of cleaning the streets was involved in mismanagement. New management was installed which led to a decrease of costs by 30% and an increase in work output by 20% which amounts to about a 50% more efficient use of money and resources. The use of Open Data had been a significant contributor to finding the problem.

The political impact of Open Data can be measured by assessing increased government efficiency and effectiveness or increased administrative responsibility and accountability. It can also be determined by measuring the improved infrastructure and quality of the data that different levels of government hold and produce, resulting in better and more reliable Open Data being offered both to users beyond government and for consumption within government. For example, in Gdansk Open Data has a positive impact on solving different city challenges. Opening data on how tax payers' money is spent by the local government increases government transparency, and gives citizens the feeling they have a better understanding of how the city budget is spent. Opening data has improved and continues to

improve the connection between technology and civil society which can lead to stronger democracy. Helsinki has adopted the same approach as Gdansk. The city has become more transparent thanks to the release of important data such as public city decision-making data (Open Ahjo API[49]). The city has also published many public data regarding Helsinki's economy and purchasing data, which shows citizens how public money is used and which companies are providing paid services to the city.

However, despite these examples, measuring the exact impact of Open Data on city life appears to be difficult for most cities investigated in this report; a situation also noticed at the national level. Once solutions (e.g. applications) are being developed that are making life easier in the city, by saving time or money, whether at the individual level or local government level, it can generally be said that a certain level of impact is apparent. Involving students and universities in building applications to potentially solve existing issues of a city, appears to accelerate the level of Open Data usage and thereby the level of innovation needed to be or become a smart city. The next section will dive deeper into the different types of successful applications built in the different cities and how citizens can make use of them.

6.2 Success stories

When zooming in on specific success stories across the eight European cities investigated, a wide variety of Open Data based applications impacting city life becomes visible. Success stories are often related to the transport sector, offering real-time transport data used by many in the city on a daily basis. In Dublin, applications are available showing where to park your car in the city centre (Park Ya[50]) or where parking spaces are available (Dublin busy app[51]), applications showing bike routes (Dublin bike scheme[52]), or applications reporting different types of footpaths that are broken (Fix your street[53]) which is important for people who are visually impaired or use a wheelchair. In Vilnius and Helsinki applications have been built for citizens to check when streets will be cleaned after heavy snowfall and providing the exact location of the snow ploughs while in Ghent the application Ojoo[54] organises city walks based on linked data provided by the Ghent Open Data portal.

Many applications are also based around a specific challenge the city is faced with. In the south of Europe, different applications are built around the warm weather. In Florence, an application was built that maps public places where citizens or tourists can refresh during warm days. Another app in Florence was created to map different sounds and light in the city to describe the specific characteristics of a space along with the social and emotional aspects linked to daily life[55]. A specific application is available that lists all Open Data applications in Florence[56].

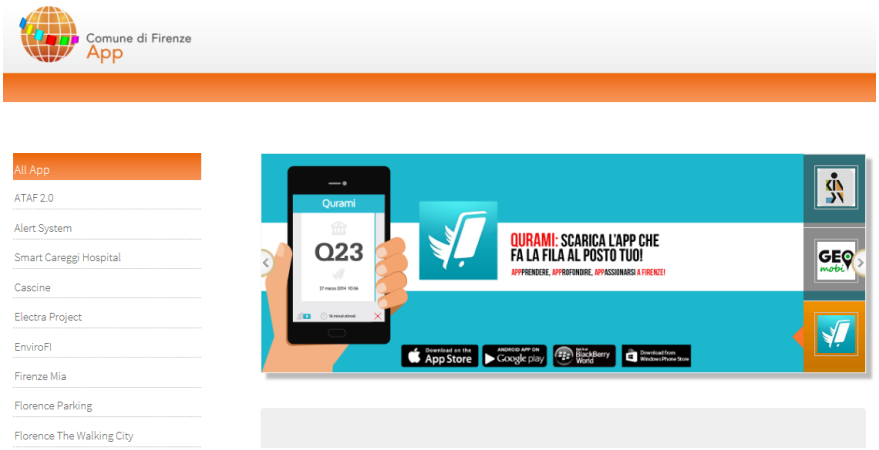


Figure 16 City of Florence app

In Gdansk, the application On4Legs[57] - generated through the cooperation of its Open Data team and the local civil tech community – connects the city shelter with future pet owners. Thanks to this co-operation, the shelter improved its IT resources and was able to provide data for the open source application. In Vilnius, one of the first datasets that were published were about public procurement. Journalists analysed the data to help solve corruption problems related to small time public procurement whereas another company uses Open Data to calculate the liveability score of different cities. The Open Data Portal of Helsinki dedicates a special section to Open Data applications[58] (shown in figure 8) which range from finding the best housing price for the urban family with children to reserving public facilities and equipment for your own use. Whereas the Dublin Dashboard[59] showcases specific applications available in Dublin.

One of the most successful applications in Ghent is Postbuzz[60] which uses city data to map daily news items in Ghent. The aim is to provide personalised and geographically tagged tailored news to individuals. More specifically, in Lisbon applications are built based on data on the electrical network of the city which is available on the Lisbon Open Data portal. This application (although open for internal government use only) has already led to the successful prevention of several accidents when digging large construction holes in public spaces and with planning public interventions.

More generally, cities experience the very existence of Open Data a success. By the end of 2017, all data in Lisbon will be open by default in accordance with the approved Open Data City Plan 2017. In Florence, people generally do not ask for specific datasets anymore, they will directly find their way to the datasets they were looking for on the city Open Data portal. While in Thessaloniki, the municipal administration is convinced that Thessaloniki needs to develop into a data-driven organisation and become a data-based city. Thousands of citizens are engaged and provide the Open Data city portal with data through the "Improve my City[61]" platform.

Figure 17 Improve My City platform of Thessaloniki

Yet it does not stop here. All cities investigated are actively working on providing more data that could solve current issues or could make city life easier. For example, next challenges in Dublin will be showing facilities in one's vicinity, such as swimming pools or playgrounds. In addition, Dublin is actively working together with small businesses and start-ups to tackle challenges in the city, such as illegal dumping. Dublinked provides them with data – which is often targeted to a particular competition - and they develop solutions for the identified city's problems. For all cities the same principle is true: the more Open Data is provided, the more the community can create new insights making the city smarter.

7 Future outlook

Despite the restrictions in terms of human resources and financial resources, all cities will expand or improve their existing Open Data initiative in the near future. They emphasised to continue working on making more data available and to improve the quality of available datasets. Ghent for instance will be working on quality labels and service level agreements for real-time data. Florence will be working on the standardisation of public road works data originating from different companies and the municipality, to reduce errors and improve data quality. The cities are also focusing on releasing real-time Open Data, specifically the cities of Dublin, Ghent and Florence, and primarily in the field of transport and mobility. The re-use of real-time transport and mobility data allows cities to address problems ranging from heavy traffic to natural disaster emergency response, almost instantaneously. In smart transit applications, smart sensors, in combination with Open Data exchanges, provide constant streams of real-time information which the system interprets and then issues predefined responses.

Dublin for instance is focusing on making real-time passenger information (RTPI) available, whereas Florence promotes and improves real-time data coming from smart Internet of Things (IoT) systems thanks to their participation in the EU Horizon2020 Smart Cities and Communities Lighthouse project. Ghent already offers real-time data, for instance the number of vehicles on the ring road, the availability of bikes at bike sharing stations and free parking spaces, and it plans to expand the number of real-time datasets. Ghent is also investing in Linked Open Data, with data being available in RDF format and linking their data to Open Data available at regional or national level.

Open Data initiatives in the eight cities are often part of or linked to broader digital or smart city strategies (Figure 18). Cities continue to invest in IoT technologies. Thessaloniki for instance will have smart lamp posts equipped with sensors in order to provide data on environmental conditions and traffic. Also Dublin, Florence, Ghent and Helsinki are actively linking their Open Data initiative to broader smart city objectives. Dublin for instance wants to better leverage the synergies between ongoing smart city projects and the Open Data initiative.

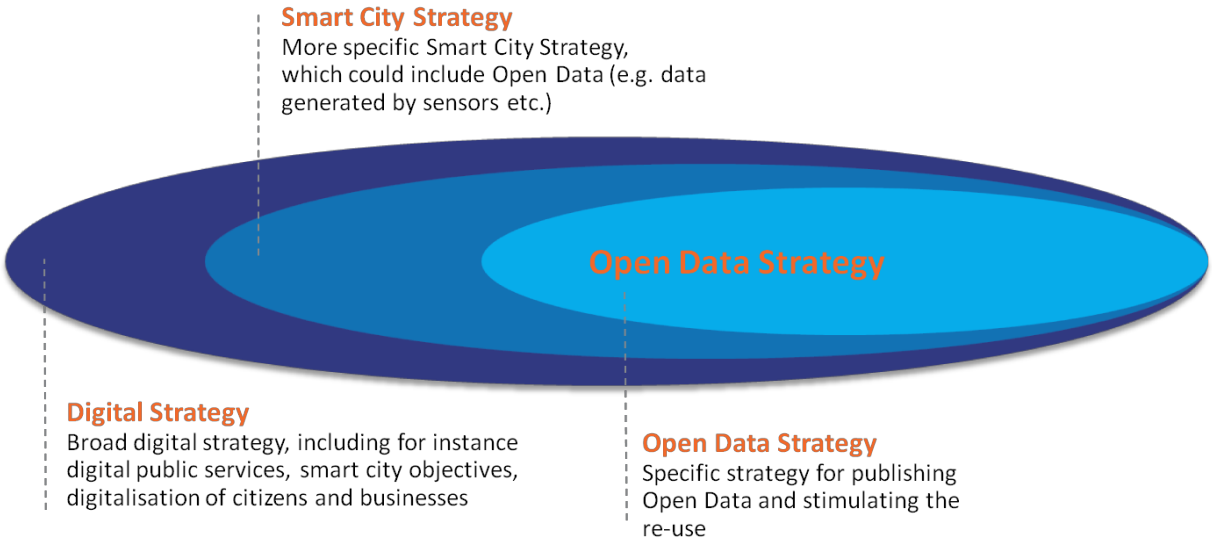


Figure 18 The link between Open Data strategies and broader Digital – or Smart City - strategies

To further improve availability and quality of Open Data or to enrich their respective portals, cities are seeking partnerships with other cities or stakeholders in the Open Data ecosystem. Helsinki is already actively involved in the Finnish Six City Strategy (6Aika) project which has a specific Open Data agenda, and wants to strengthen the role of the city as a platform for new solutions in co-operation with businesses and other partners. Florence is involved in the 'Bloomberg What Works Cities partnership[62]' to share best practices on the topic of Open Data, and also Thessaloniki and Vilnius are involved in Open Data partnerships. Vilnius will sign a memorandum of understanding this year with six other cities, to share knowledge in the area of IT, Open Data and data analytics. Ghent aims at intensifying cooperation following the 'Quadruple Helix[63]' model for open innovation, to provide decentralised data management (crowdsourcing, distributed ownership).

Finally, Lisbon will establish partnerships primarily for the enrichment of their portal. It wants to improve the portal back office and interface and introduce new features. In the same light, the city of Florence expects to launch a new Open Data portal in 2017.

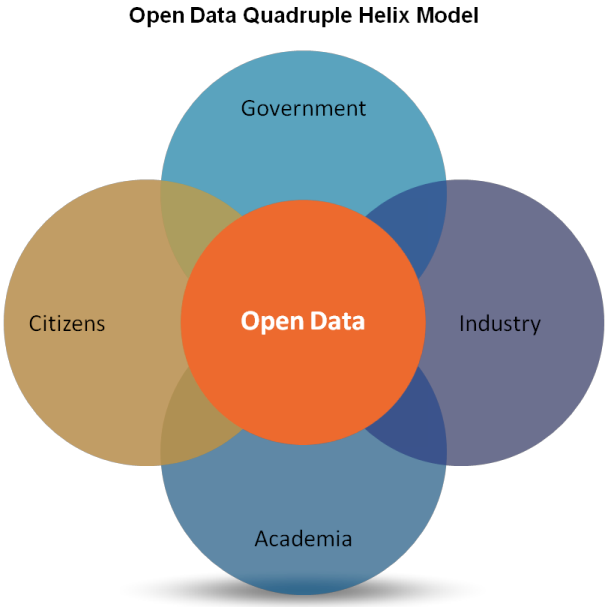


Figure 19 Quadruple Helix Model in Ghent

Lisbon, Helsinki and Gdansk have clear plans to improve user engagement. This is important, as recent research on the re-use of Open Data indicates there is still a gap between the data that users need and the data provided by publishers. Lisbon is working on the creation of a Data Lab to promote and optimise the available data, and is initiating 'Lisboa Aberta Certified': a certification scheme for apps developed with Open Data from their portal. Gdansk wishes to cooperate more with the end-users, such as developers. Organising events such as 'Code for Poland' in Gdansk allows the city to engage with the user community. Helsinki plans to encourage communities to use the city's data, and to organise regular meet-ups to enhance the understanding of data. Through these events they want to explain the purpose of Open Data and understand the needs and challenges of potential users. This should better align their data provision strategy with the needs of users, resulting in more data being re-used and making the city a smarter place.

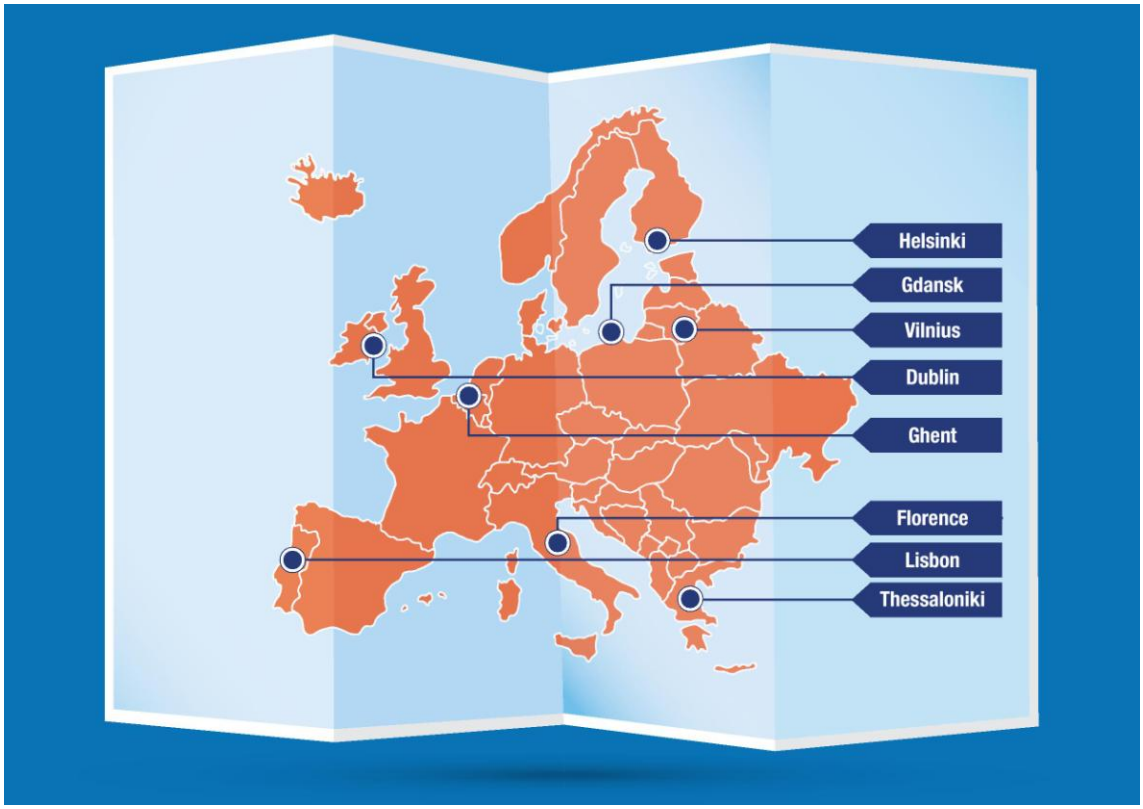
Finally, cities foresee activities to improve awareness and to improve their internal Open Data skills. Thessaloniki aims to educate and inform municipality employees about Open Data and Open Government, and Dublin will host workshops to provide public administrations with basic data skills. Florence will organise learning sessions for civil servants to promote the usage of the portal in their

everyday work through the use of QGIS[64]. These are important developments, as the report on Open Data barriers recently indicated that a lack of skills constitutes a barrier for the further uptake of Open Data, especially among lower tiers of government[65].

7.1 Recommendations

European cities are embracing Open Data and are well underway in their Open Data journey. The eight cities investigated in this report have Open Data portals in place backed by Open Data policies, but their Open Data maturity differs. What lessons can be learned from these examples to further advance with Open Data on a city-level?

- Embed your Open Data initiative in a broader Smart City strategy to fully exploit the synergies between Open Data and Smart city objectives and to reap the benefits of developments like IoT;
- Given the limited amount of resources available in many cities, focus on making available or improving the quality of high value data on a city level – e.g. real-time data in transport and mobility domain;
- Overcome the barrier of a lack of skills or resources by seeking partnerships with other cities;
- Show the practical use of Open Data and make it tangible, e.g. through visualisations on a city dashboard, to boost awareness and to engage with re-users;
- Organise or become involved in events aimed at engaging with the user community, e.g. regular open meet-ups, thematic hackathons specifically based on city data, etc.;
- Build strong commitment from the top (top-down approach) to accelerate your Open Data initiative;
- Coordinate at a national level, as done in Ireland through a specific project group tasked with assisting local and regional authorities on the topic of Open Data, to overcome organisational, technical, financial and capacity barriers.



Annex I – City fact sheets

Dublin – City specifics and Open Data

EUROPEAN DATA PORTAL

Dublin Online

- Dublin Dashboard: http://www.dublindashboard.ie/
- Smart Dublin: http://smartdublin.ie/ Dublinked: www.data.dublinked.ie
- Department of Public Expenditure Reform: http://www.per.gov.ie/en/open-data/
- South Dublin County Council: http://data-sdublincoco.opendata.arcgis.com/
- Fingal Open Data Portal: http://data.fingal.ie/
- EU Open Data Project Route to PA website: www.routetopa.eu

Context

- 1,345,402 million inhabitants [2016]
- 1st largest city and capital city of the Republic of Ireland
- Population density 4,811/km² [2016]
- Average age of the inhabitants is 36.4 [2016]
- Average GDP per capita is € 67,947 for 2017

Policies & regulations

- Irelands Open Government Partnership National Action Plan 2016-2018
- Open Data Publication Handbook
- Open Data Ireland Best Practise Handbook

Open Data strategy

- Drive efficiencies through connected networks, connected infrastructure and a connected city region
- Engage with entrepreneurs, citizens, researchers and business to solve city region challenges and promote economic development
- Foundation Document for the development of the Public Service Open Data Strategy
- Open Data Governance Board

Licensing

- Creative Commons Attribution 4.0
- Free of charge

Portal features

- 250 datasets, 9 categories and 11 publishers
- API accessible
- Interaction with citizens: news, blogs, data stories and event information for data users.
- The contact us page provides a form to submit data requests, subscribe to the mailing list and find contact information for the platform administration team

Top datasets & domains

1. Journey times across Dublin City
2. Journey times across South Dublin County
3. Real-time Passenger Information (RTPI) for Dublin Bus, Bus Eireann, Luas and Irish rail
4. On Street Disabled Parking Bay in Dublin City Council area
5. dublinbikes

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Dublin – Activities and partners

EUROPEAN DATA PORTAL

Events 2017

- Events are regularly organised, such as:
  - #DataDiscovery
  - #OpenAppChallenge
  - #2017SBIRChallenges
  - #HackAccessDublin – Join the Mobility Movement 2017
  - Smart Technology Solution to help scale up cycling in Dublin –Phase 2

Partnerships

- Dublinked began in 2011 as a regional initiative of the 4 Dublin local authorities in partnership with IBM and Maynooth University.
- It was re-launched in March 2017 under the umbrella of the Smart Dublin regional project seeking smart tech solutions to improve challenges faced in the Dublin region.
- Smart Dublin and Dublinked are involved in several EU H2020 consortiums and have partnerships with ICT companies, SME's, entrepreneurs, universities and public administrations in Ireland and internationally.
- Smart Dublin liaises with the Open Data Unit in the Department of Public Expenditure and Reform and co-ordinates meetings for the Local Government Open Data Project Team.

Smart city areas

- Smart Mobility
- Smart People
- Smart Environment
- Smart Economy
- Smart Government
- Smart Living

Integration portal

- Smart Dublin's Dublinked Open Data portal is harvested by the Irish national portal https://data.gov.ie/

Social media

- Twitter: @Dublinked @SmartDublin
- Youtube: Smart Dublin

Initiatives

- Real Time Passenger Information (RTPI)
- Is Dublin noisy?
- Smart flooding solutions - Real time flood warning!
- Smart environment – Solar compactor smart bins which optimise fleet and assist in route rationalisation
- Fix your street

Next steps

- Implement actions outlined in the National Open Data Action Plan 2016-2018.
- Promote the value of an Open Data ecosystem
- Host workshops to provide public administrations with basic data skills
- Increase the number of good quality datasets available for re-use on the Dublinked Open Data portal.

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Florence – City specifics and Open Data

Florence Online

- City Open Data portal: http://opendata.comune.fi.it/
- City of Florence: http://en.comune.fi.it/
- Open Data portal Tuscany region: http://dati.toscana.it/
- Visit Florence: http://www.firenzeturismo.it/en/

Context

- 377.635 inhabitants [31/01/2017]
- 8th largest city of Italy
- Population density 3,753/km² [2016]
- Average age of the inhabitants is 46.5 [2015]
- Average GDP per capita is 23,265 in 2008

Policies & regulations

- Digital Florence Manifesto: Benchmark of smart city initiatives, approval of main digital assets to be shared and promoted in the City with other public service providers
- Florence Smart City Plan (STEEP):
  - A forecast for 2030 and 2050 was drafted to make sure targets will be met
- Targets: integrated planning, PA efficiency, energy efficiency, ICT, mobility, prosperity, liveability, communications

Open Data strategy

- Provide important data concerning all aspects of city life
- Increase transparency by allowing open access to the city's data and statistics

Licensing

- Creative Commons CC-BY 3.0 IT
- Free of charge

Portal features

- 1389 datasets
- 20 categories
- 1 citizen-generated data, 2 external data producers (Publiacqua and Autorità di Bacino Fiume Arno)
- API available via CKAN API and OGC Web Services (still not promoted as a mean to access data on a regular basis from the wide public)
- Interaction with citizens: possibility to search data sets, send mail or call, comment via twitter or facebook, refer a data set, propose a theme or topic via twitter , propose an app based on Open Data Firenze (app.comune.fi.it)

Top datasets & domains

Top data sets:

1. Election Results
2. Wifi
3. Paths bike lanes
4. In the budget
5. Water level Bilancino reservoir

Florence – Activities and partners

Events 2017

- March 4th 2017: International Open Data Day (together with Tuscany Region, Metropolitan City, University of Florence, Association of Public Utilities of Florence)
- April 7th 2017: hackathon of Sii-Mobility project (Univ of Florence) also based on Open Data Firenze and partecipated by the Municipality

Partnerships

- Firenze Digitale partnership with Public Utilities and Chamber of Commerce and Tuscany Region on data sharing and other digital services sharing (http://www.firenzedigitale.it/en/cosa_e.html)

Smart city areas

- Smart Tourism
- Smart Benches
- Smart Mobility
- Smart metering services.
- Smart Lighting
- Smart city control rooms
- Smart irrigation systems

Integration portal

- The Open Data portal of Florence is harvested by the national Italian Open Data Portal http://www.dati.gov.it/ and RNDT http://www.rndt.gov.it/

Social media

- Twitter Open Data Portal Florence: https://twitter.com/search?q=%23opendatafirenze

Initiatives

- App.comune.fi.it to promote apps based on Open Data Firenze
- Students involved in learning/working activities based on ETL, Open Data and open source data processing technologies
- Professionals involved in learning sessions to promote the usage of Open Data Firenze in their everyday work through QGIS
- Bloomberg What Work Cities partnership with Florence to promote Open Data best practices
- Synergies with Sound and Light mapping activities among Florence and Berlin (firenzesoundmap.org)

Next steps

- Promotion and improvement of realtime data coming from smart IoT systems thanks to the EU H2020 SCC1 REPLICATE Lighthouse project
- Standardization of public street works data sharing among the different companies and the Municipality to reduce errors and improve data quality and sharing
- New open data website (expected in 2017)
- Evolution of APIs with respect to European standards

Ghent – City specifics and Open Data

Ghent Online

- Open Data Ghent: https://data.stad.gent/
- Linked data portal Ghent – Sparql endpoint: http://stad.gent/sparql
- Geometadata portal Ghent: https://geometadata.gent.be/geonetwork/
- Mobility in Ghent: https://mobiliteit.stad.gent/
- Smart City Ghent: https://stad.gent/smartcity

Context

- 259,453 inhabitants [2016]
- 4th biggest city of Belgium
- Population density 1,590km² [2014]
- Average age of the inhabitants is 39.7 [2011]
- Average GDP per capita is € 43.174 in 2011

Policies & regulations

- Ghent aims to be a "City of People" – A city in which smartness is defined by the well-being of its citizens
- Ghent Digital City' is one of the priorities of the city, adopting the principle of digital inclusion
- Open Data is one of the items in this strategy. Also: Smart city, ICT, Living lab, etc.

Open Data strategy

- Reconnect people with their environment and the city
- Creating more efficient and optimal relationships
- Make citizens responsible for their environment

Licensing

- By default, Ghent follows the licenses recommended on the Flemish level (Modellicentie Gratis Hergebruik)
- A general privacy statement and a disclaimer is provided at the bottom of the page.

Portal features

- 227 datasets and real-time API's
- 15 non-hierarchical domains are available (based on and mapped towards the EC's Data Themes NAL)
- Interaction with citizens > option to submit 'ideas'
- Use cases developed with Open Data are presented
- The portal uses the DCAT-AP specification to harvest data from different data sources within the City -> decentralized mgmt.
- Linked Open Data is available in RDF, Turtle and JSON-LD

Top datasets & domains

- 15 categories are available
- A filter allows users to select or deselect geospatial data
- A large offering of real-time datasets, mainly re. mobility
  - Real-time #vehicles on the city ringroad
  - Real-time availability of bikes at bike sharing stations
  - Real-time announcements of the traffic mgmt system (including # free parking spaces etc.)

Ghent – Activities and partners

Events 2017

- Apps for Ghent, an annual hackathon with Open Data in Ghent
- The Futures of Data local event on the role of data in society
- Startup Weekend Ghent corporate hackathon

Partnerships

- For Apps for Ghent, the City of Ghent, Open Knowledge Belgium, Ghent Living Lab, educational and research institutions, Nerdlab, local incubators (Watt Factory, Co.Station Ghent)
- In Smart City domain in general: Ghent is a member of Eurocities,

Smart city areas

Ghent bases its strategy on 9 strategic goals: Ghent opens opportunities, is climate neutral & energy independent, opts for sustainable transport, living in Ghent is pleasant and affordable, Ghent has a Sustainable economy & industry, Ghent is a learning and creative City, with desire for experience and solidarity, is a safe, healthy and viable city and has a network of effective public services

Integration portal

- The Open Data portal of Ghent is harvested by the Flemish regional portal, which is in turn harvested by the national portal http://data.gov.be/, and the pan-European Data Portal

Social media

- Twitter Stad Gent, AppsForGhent
- Facebook Stad Gent, AppsForGhent
- Also on LinkedIn, YouTube and Instagram

Initiatives

- Ghent Living Lab, Apps For Ghent, Commons Transition Plan, Open Summer of Code, Lab9K, Code for Ghent, …

Next steps

The roadmap for Open Data in Ghent is to

- Work with the quadruple helix to provide decentralised data management (crowdsourcing, distributed ownership)
- Work on quality labels (and SLA's) for real-time data and API's
- Continue the work on Linked Open Data and connect with (trans)national open data initiatives
- Develop a safe and understandable (semantic) approach to IoT

Helsinki – City specifics and Open Data

EUROPEAN DATA PORTAL

Helsinki Online

- Regional Open Data Portal - Helsinki Region Infoshare: http://www.hri.fi/en/
- City of Helsinki: http://www.hel.fi/; portal for developers https://dev.hel.fi/
- Forum Virium Helsinki: https://forumvirium.fi/en/
- The Six City Strategy (6Aika): https://6aika.fi/in-english/
- Helsinki Region: http://www.helsinkiregion.fi/www/hs/en

Context

- 628,208 inhabitants [2016]
- Largest city of Finland
- Population density 2,902/km² [2016]
- Average age of the inhabitants is 40.5 [2015]
- Average GDP per capita is 47,829 € in 2013

Policies & regulations

- Decisions made by the City Board in each four cities in Helsinki Metropolitan Area in 2012
- The City of Helsinki Strategy Programme 2013-2016
- Helsinki ICT programme 2015-2017

Open Data strategy

- HRI is part of normal operations in Helsinki Metropolitan area
- HRI has a steering group that approves action plan of HRI annually
- The cities behind HRI service are also implementing the Six City Strategy programme including open data project

Licensing

- Creative Commons Attribution 4.0 International (CC BY 4.0)
- Data is available free of charge

Portal features

- 586 datasets (March 2017)
- 20 categories
- Owned by four cities (Helsinki, Espoo, Vantaa and Kauniainen)
- API accessible
- Interaction with citizens: submit new data, request a data set, news section and blogs
- App gallery
- Instructions, articles, comments

Top datasets & domains

Top data sets: (last 30 days / February 2017):

1. Helsinki metropolitan postal code areas
2. 3D model of Helsinki
3. Combined Detailed Plan Map of The City of Helsinki
4. Helsinki Road Signs and Parking Lots Pilot in Southern Helsinki
5. Information about Finland in many languages

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Helsinki – Activities and partners

EUROPEAN DATA PORTAL

Events 2017

- DataBusiness Challenge open data competition – the Final Sprint and Awards Gala, http://www.databusiness.fi/en/challenge/
- Helsinki Loves Developers - Open Data Open Offices take place once a month, www.facebook.com/groups/heldev/
- Trainings for the civil servants

Partnerships

- The HRI service is owned and funded by the cities of Helsinki, Espoo, Vantaa and Kauniainen
- The Finnish Ministry of Finance and Finnish Innovation Fund Sitra have also supported the service in the project planning phase
- The Six City Strategy (6Aika) cooperation between Helsinki, Espoo, Vantaa, Tampere, Turku and Oulu.

Smart city areas

- Smart living conditions
- Smart Economics
- Smart Employment
- Smart Traffic
- Smart Environment

Integration portal

- The Open Data portal of Helsinki Region is harvested by the national portal https://www.opendata.fi/

Social media

- Twitter Helsinki Region Infoshare: https://twitter.com/HRInfoshare
- Facebook: www.facebook.com/helsinkiregioninfoshare/
- Linkedin: www.linkedin.com/groups/12021417
- Youtube: www.youtube.com/user/HRInfoshare
- Slideshare: www.slideshare.net/helsinkiregioninfoshare
- Github: https://github.com/Helsingin-kaupungin-tietokeskus

Initiatives

Open Data related initiatives in Helsinki:

- Digital Helsinki Programme
- Helsinki City Lab - Design Driven City
- Smart Kalasatama Project
- Six City Strategy (6Aika) - Empowering Innovation by boosting and scaling up open data innovations via data harmonization and collaboration

Next steps

- Facilitate the opening and exploitation of public data
- Strengthen the role of the city as the platform for new solutions in co-operation with businesses and other partners.
- Remain actively involved in the Six City Strategy (6Aika) project

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Lisbon – Activities and partners

EUROPEAN DATA PORTAL

Events 2017

- 2nd Edition Think Open Data Lisboa Workshop [experts]
- Open Data Crowd Sourcing Day [all publics]
- Lisboa Aberta Challenge [for high school and university students]

Partnerships

- Companies
- Universities

Smart city areas

- Smart Mobility
- Smart Housing and Development
- Smart Population
- Smart Economics and Innovation
- Smart Urban planning
- Smart Culture and Heritage
- Smart Environment
- Smart Tourism and Leisure
- Smart Education

Integration portal

- The Lisbon Open Data portal is not harvested by the national Portuguese Open Data Portal

Social media

- Twitter Lisbon City Council: https://twitter.com/CamaraLisboa
- Facebook Lisbon City Council: https://www.facebook.com/camaradelisboa
- Facebook Open Data: https://www.facebook.com/dados.abertoslx
- Also: issuu, Instagram, vimeo, YouTube, SAPO videos, Google+

Initiatives

- Think Open Data Lisboa 2016 and 2017 workshops
- Open Data crowdsourcing day
- Lisbon open challenge
- Smart Open Lisboa (http://www.smartopenlisboa.com)

Next steps

- Creation of a Data Lab [to promote and optimize the use of datasets available]
- Lisboa Aberta Certified [a certification of the apps developed from the portal datasets]
- Improvement of the portal back office and interface, introducing new facilities and tools (as feeds, statistics, analytics, web services…)
- Definition of data quality and data security referentials
- Development of new partnerships for portal enrichment

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Lisbon – Activities and partners

EUROPEAN DATA PORTAL

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Thessaloniki– Activities and partners

EUROPEAN DATA PORTAL

Thessaloniki Online

- Open Data Portal Municipality of Thessaloniki: http://opendata.thessaloniki.gr/
- eGovernment portal Municipality of Thessaloniki http://opengov.thessaloniki.gr/ (Smart and Open Thessaloniki)
- Open Budget service: http://www.thessaloniki.gr/egov/budget.html
- STORM project Thessaloniki: https://smartcity.thessaloniki.gr/
- City of Thessaloniki: http://www.thessaloniki.gr/
- GIS Municipality of Thessaloniki http://gis.thessaloniki.gr/sdi/ (geo-data)

Context

- 325,182 inhabitants [2011]
- Second largest city of Greece
- Population density 7,100/km² [2011]
- Average population age 35.9 [2011]
- Average GDP per capita €17,200 [2009]

Policies & regulations

- The Municipality of Thessaloniki has a Digital Strategy
- Open Government is an important component of this strategy, with Open Data being one of its five pillars.
- Resilient Thessaloniki strategy (member of 100 Resilient cities). Data-driven Thessaloniki as one of its main pillars.

Open Data strategy

- Strengthening the local economy through digital services:
  - Community Activation
  - Prototype Creation
  - Co-design Section
  - Services Validation

Licensing

- Free of charge
- Open licence
- Open Data Commons Open Database license (ODbL) and Open License Public Geospatial Information (v1.0)
- National licence for geospatial data

Portal features

- 74 datasets
- 8 categories
- API access
- The main publisher is the Municipality of Thessaloniki
- The portal has recently been migrated to a new DKAN platform, the Drupal-based version of CKAN.

Top datasets & domains

1. Urban design
2. Public administration
3. Environment
4. Tourism
5. Education

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Thessaloniki– Activities and partners

EUROPEAN DATA PORTAL

Events 2017

- Launch of the Smarter Cities challenge multi-stakeholder project about a city-wide Open Data dashboard
- Launch of the City's new portal
- Launch of an online consultation platform

Partnerships

- Thessaloniki participates in the EIP for Smart Cities & Communities
- Member of a National MoU for Smart Cities
- Member of the 100 Resilient Cities initiative
- Strategic partnership with Open Knowledge Foundation (Greek chapter)
- Strategic partnership with Greek Free Open Source Society (GFOSS)

Smart city areas

- Smart Governance
- Smart Mobility
- Smart Energy
- Smart Economy
- Smart Citizens

Integration portal

- The Open Data portal of Thessaloniki is harvested by the national portal http://www.data.gov.gr/

Social media

- Currently a Google+ channel
- A strategy and framework for social media management has already been defined

Initiatives

- Digital strategy
- 3 crowdsourcing competitions - all included the exploitation of open data
- eGovernment platform with many e-Services
- "Improve my City" platform
- 2 commitments in the national plan for Open Government (part of OGP's sub-national section)
- Open Budget service
- Digital mall (Storm Clouds project)
- Thesswiki

Next steps

1. Action plan for the Digital Strategy implementation
2. Smarter Cities challenge project launch
3. Improvement of the Municipality's Open Data quality
4. Educate and inform Municipality's employees about Open Data and Open Government

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Vilnius– Activities and partners

EUROPEAN DATA PORTAL

Vilnius Online

- Open Data Vilnius: http://atviras.vilnius.lt/
- Vilnius City Municipality: https://www.vilnius.lt/
- Vilnius City Municipality Github: https://github.com/vilnius
- Smart City Vilnius: http://www.smartcityvilnius.com/en/home.html
- Geographic Open Data portal: http://gis-vplanas.opendata.arcgis.com/

Context

- 535,216 inhabitants [2016]
- Largest city of Lithuania
- Population density 1,392/km2 [2016]
- Average age of the inhabitants is 37.0 [2011]
- Average GDP per capita is € 14271.51 for 2015

Policies & regulations

- Rules for Vilnius City Municipal Government to open up data (2015)

Open Data strategy

- Open Vilnius strategy
- GovEx podcast interview with Povilas Poderskis

Licensing

- Free of charge
- Open licence
- Standard licence provided

Portal features

- 50 datasets
- API access
- Five domains
- There is a blog section available
- There is an events section – Code for Vilnius
- There is a news section available

Top datasets & domains

Only five categories are used

1. Finance & Real Estate
2. Transport
3. Education
4. Democracy
5. Processes

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Vilnius– Activities and partners

EUROPEAN DATA PORTAL

Events 2017

- Login Conference Vilnius (IT conference): 24-26 May 2017
- Ad-hoc hackathons and community projects

Partnerships

- BTT
- DigiState
- Vilnius Gediminas Technical University

Smart city areas

- Smart City
- Smart Home Automation
- Smart Environment
- Smart Industry
- Smart Agriculture
- Smart Healthcare
- Smart Metering
- Smart Retail & Logistics

Integration portal

- The Vilnius City Municipality portal is harvested by the national portal http://opendata.lt/

Social media

- Twitter Open Data Portal Florence: https://twitter.com/search?q=%23opendatafirenze

Initiatives

- Code for Vilnius
- Startup Sandbox
- Ad-hoc hackatons and community projects

Next steps

- Sign a memorandum of understanding in 2017 with six other cities, to share knowledge in the area of IT, Open Data and data analytics

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[9] European Data Portal (2016), How to address privacy concerns when opening data
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[11] Foundation Document for the development of the Public Service Open Data Strategy
[12] Open Data Publication Handbook
[13] Open Data Ireland Best Practise Handbook
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[15] City of Gdansk manifesto of openness
[16] City of Helsinki Strategy Programme 2013-2016
[17] Ghent Council agreements 2013-2018
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[20] Vilnius Rules
[21] Cities as digital platforms – Challenges and opportunities in the Municipality of Thessaloniki
[22] Thessaloniki's Resilience Challenge
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[25] Smart Florence Plan, September 2015
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[30] Lisbon Open Data Portal
[31] Metropolitan city Florence
[32] Tuscany Open Data Portal
[33] DCAT-AP
[34] Dublin Dashboard
[35] Smart Open Lisbon
[36] Vilnius Open Data Portal
[37] Digital Helsinki portal
[38] Dublin, Florence, Gdansk, Ghent, Florence, Helsinki
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[50] ParkYa
[51] Is Dublin busy?
[52] Dublin Bikes
[53] Fix your street

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[63] In a Quadruple Helix Model, government, industry, academia and civil participants work together to co-create the future
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