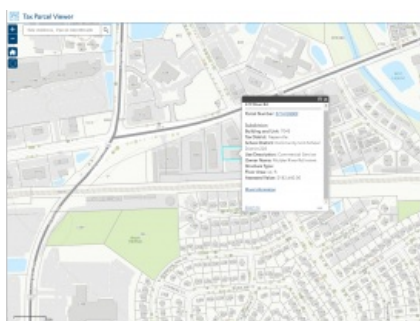
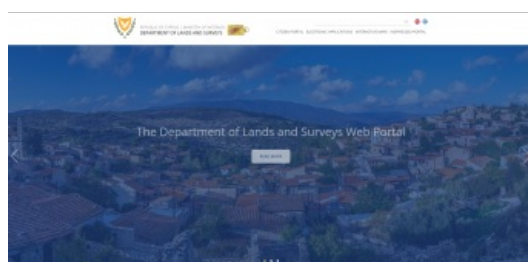


# HOW OPEN DATA FOR CADASTRAL RECORDS IS GAINING TRACTION

## Shedding Light on the Land Sector



Despite the enormous importance of good land governance for sustainable economic growth and social justice, land administration remains a sector that is lacking openness and transparency in many parts of the world. Land registry and cadastral records are often deemed too sensitive to share, unless acquired for a fee, or the records themselves may be unreliable or in formats that are not easily accessible. In geographies where the rule of law may not be strong, this presents opportunities for government abuse and corruption.

A 2013 study by Transparency International found that one in five people around the world reportedly had paid a bribe for land-related services. In Kenya the average bribe paid for land-related services was found to be more than

US\$100. When this is added on top of the normal transaction fees, the total transaction costs can exceed 10% of the average annual household income. Against this backdrop, it is no surprise that many households refrain from registering their property.

### Open Data

The idea of open data is not new, but traction in the land sector has been slow. Both the Open Data Barometer and the Global Open Data Index rank land ownership information as being far behind in its level of openness as compared to other datasets such as government budgets and national statistics. Open data often refers to data that can be freely used, reused or redistributed – usually with the only restriction being to give attribution to the originator of the information. From a government perspective, opening up access to public data can help facilitate transparency, accountability and public participation. Increasingly, governments are also recognising how open data strategies can support innovation and generate economic value. According to a 2016 Gartner report titled *Market Guide for Government and Open Data Management Platforms*, 80% of organisations will be incorporating open data sources into their analytic solutions by 2017. A further 15% of global organisations will be using linked data methods to create applications to generate alternative revenue streams.

### Land Sector

When it comes to open data in the land sector, one question that arises is which data to share. In many countries, there may be legal or cultural restrictions on the level of personal data that can be released. As a result, most open data initiatives in the land sector have focused on publishing some combination of parcel and administrative boundaries, addresses, tenure type, parcel ID numbers, parcel size, property values and land use. Although not complete, this information holds tremendous value for real estate professionals, utility companies, homeowners, planners, insurance companies, fire and emergency response, entrepreneurs and citizens. The inability to easily access such information in many parts of the world increases risks and drives up costs for anyone trying to acquire, lease, develop or service a property.

### Cyprus

Regardless of the slow pace at which governments are sharing their land administration data, there do appear to be some encouraging

trends. The European Union's INSPIRE Directive requires member states to publish the geography of cadastral parcels. This has served as an impetus for many European Union states to increase access to their cadastral data. One example is Cyprus, which recently launched a web-based portal for different sets of geographic data (see Figure 1). It is accessible to government staff and the public and consists of an easy-to-use website where all information regarding the department and its operations can be found. It also includes a public-facing GIS page that serves cadastral, topographic and hydrographic data, and an e-Applications Dashboard with various online applications such as Property Search, Provision of Vector GIS Data, e-Discharge of Mortgages, Sales Information to Valuers, Vector Information to Private Surveyors and more. In addition, a dedicated INSPIRE GeoPortal platform is integrated inside the Department of Lands and Surveys (DLS) Web Portal [<http://portal.dls.moi.gov.cy/en-us/homepage/pages/default.aspx>], helping to fulfil the requirements of the INSPIRE Directive for Cyprus. The DLS portal is now the one-stop shop for Cyprus relating to all real property information. Before implementation, the department collected a plethora of land record data, some of which was over 100 years old. Whereas it was once time-consuming and inefficient to manage, the process for organising and sharing the data is now quick and a routine part of daily operations. This has helped decrease turnaround times for common information requests, improving service delivery for the public and reducing operational costs for the department.

## Canada

In addition to enhancing service delivery, publishing land-related data can improve emergency response, increase public participation in planning, and provide standardised access to land and property attributes that may have previously been spread across multiple jurisdictions. For example, the Community Cadastral Map of Canada provides a single, online national cadastral map that aggregates and standardises cadastral data from federal, provincial and municipal sources (see Figure 2). The map includes information on parcel boundaries, identifiers for registered titles, assessment, survey and zoning parcels, and direct access to additional data from the systems of participating jurisdictions. The Community Cadastral Map of Canada [[CanadaCadastral.Maps.ArcGIS.com](http://CanadaCadastral.Maps.ArcGIS.com)] is based on the Community Map of Canada, which is a single, standardised national topographic and imagery map aggregated from multiple levels of government. The Community Map of Canada currently serves more than 200 million map requests per month from users across government, the private sector and academia.

## Web GIS

Both the Cyprus and Community Cadastral Map of Canada websites leverage the web GIS pattern. This allows organisations to securely share authoritative cadastral maps, applications and other geographic information over the internet with groups both inside and outside of an organisation. In the case of Cyprus, ArcGIS for INSPIRE was utilised, which provides a powerful and modern web GIS solution to help organisations meet current INSPIRE requirements for supporting data, services and metadata. The Community Cadastral Map of Canada is based on ArcGIS Online, which is Esri's cloud-based mapping platform. These portal websites are configurable, allowing organisations to easily adjust the appearance of their web pages and set which services, applications and basemaps are available.

## Public Access

Through its work with governments across the globe, Esri has learned that providing access to data is only the first step in terms of supporting an open data initiative. Open data can also be brought to life through creation of tools and applications such as the Residential Comparable Sales Finder, which is a free application that lets the public compare recently sold properties and evaluate their characteristics. Another application called Parcel Viewer (<http://statelocaltryit.maps.arcgis.com/apps/webappviewer/index.html?id=e03ee104d0d34c32990a731e2014f2f9>) (see Figure 3) enables quick and easy public access to cadastral maps and related parcel attributes through a modern look and feel. These are just a few examples of the free applications that could be deployed using a replica of authoritative data. In addition to these existing industry apps, online resources facilitate fast, free and configurable web application development that can help meet the needs of government, business and the public (see Figure 4).

## Hackathons

Providing tools and applications for stakeholder use and data analysis is part of the process of getting smarter about open data. It is not only about how much data is posted, but also which datasets are best and which have value. In addition to prioritising the data to release, it is also important to keep it up to date, usable and interoperable. Utilising standards can help ensure that an organisation's data can be enriched with other sets of information, which is where one derives valuable insights. Hosting hackathons can be a constructive way for developers, designers and entrepreneurs to leverage open data for the resolution of real-world problems. By integrating cloud, web and mobile technologies with publicly available property information and analytics one can create applications that can serve various stakeholders, ranging from real estate developers to citizen journalists and the general public.

## Concluding Remarks

Whereas publishing geospatial data used to be a time-consuming and costly endeavour, it is now becoming a routine part of daily operations for many cadastral organisations. Initial fears over the loss of revenue from the provision of data have been replaced by the potential return on investment associated with improved data management. The cost savings from eliminating the workload associated with redundant requests from multiple government agencies, fulfilling data orders and collecting and accounting for related fees are substantial. Governments also stand to gain from increased land market activity, tax collection and the broader economic development that can be spurred by making cadastral data more readily accessible. A 2016 study carried out by ConsultingWhere Ltd. examined the financial costs and benefits of address and street data for local authorities in England and Wales and found a net benefit of approximately GBP86 million in savings between 2010-2015. These returns were largely driven by reduced data duplication, improved tax revenues and route optimisation in waste management. Similar studies in other geographies have found similar returns on investment. The business case and technology platform for open data is there. It is now time for cadastral agencies to reposition themselves at the heart of their respective nation's spatial data infrastructure.

