The GeoFoundation Exchange (GFX)

Modernizing Canada's Digital Infrastructure

GFX Executive Briefing

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CANADA'S BEST MANAGED COMPANIES

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A modern digital economy requires open digital infrastructure to maximize productivity, safety, sustainability and innovation. To ensure Canada achieves these goals, base mapping--a critical component of Canada's digital infrastructure-- requires modernization and a new approach that unifies the disparate efforts of various agencies that manage authoritative data for maps. The GeoFoundation Exchange (GFX) initiative presents a unique opportunity for Canada to leverage modern technologies, collaborative approaches and open data policies to streamline Canada's base mapping processes, drive down current mapping costs and improve base mapping products and services for the benefit of all Canadians.

The GeoFoundation Exchange (GFX) is a data sharing and collaboration initiative being advanced by Esri Canada in cooperation with Natural Resources Canada (NRCan) and other provincial and municipal organizations from across Canada. The GFX will significantly reduce overall annual government operating costs, while providing Canadians across all sectors of the economy with modernized, open access to commonly-needed data to support effective planning, analysis and decision-making.

Modern base mapping, which depicts the road network, address points, property limits, buildings, railways, topography and other commonly required information, is an essential component for productive activities across many sectors of the Canadian economy. This type of mapping should be considered **"critical digital infrastructure"** for Canada and, from an investment perspective, is equally as important as physical infrastructure. Important daily uses of base mapping include police and ambulance dispatch, resource management, energy management, utility services, telecommunications services, transportation management, emergency management and many others.

Public and private sector organizations that need base mapping require complete, seamless and up-to-date coverage of their areas of interest (which can range from local areas to the entire country). They also require open licensing in order to maximize the levels of productivity and innovation that can be derived from it.

Currently, in spite of extensive mapping efforts by all levels of government, technical innovations and open data policy progress, there is no definitive source for modern, up-to-date and complete digital base mapping in Canada. Current offerings are often duplicative, fragmented, disparate in nature, subject to usage restrictions and often not aligned with the [Open Government data licensing under Canada's Open Data policy](#).

The GFX in Brief
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The GFX is the national, collaborative, open data exchange for accurate and authoritative geographic base mapping data – designed to facilitate the coordination and modernization of Canadian base mapping. The GFX employs cloud-based services to coordinate the activities of authoritative base mapping producers - making base mapping activities more efficient, more cost-effective and more responsive. The GFX automates vector data contributions (initial load and updates) from authoritative contributors at all levels of government and organizes this data into a common exchange. Authoritative base mapping producers at all levels of government can efficiently leverage this common exchange to reduce their base mapping costs and improve the products and services they offer to their end users.

Significant costs can be saved by streamlining and coordinating existing base mapping activities at the municipal, provincial and federal levels into a unified, exchange-based solution. The products and services resulting from this unified national solution could be

made openly available to the user community, translating into additional cost savings and productivity improvements.

A modernized, exchange-based approach to base mapping, which leverages cloud technologies and aligns with Canada's Open Data policy, would yield sizeable annual benefits for provincial and national mapping organizations in terms of reduced mapping costs, improved coordination of activities and enhanced services to end users. In addition, such an approach would benefit many other organizations inside and outside of government (for example, police, utilities, energy, telecommunications, insurance, natural resources and others) that need efficient access to modern, up-to-date base mapping on a daily basis. Valuable human resources in all of these organizations that are currently engaged in duplicative and inefficient mapping efforts could be more effectively deployed into other, core business activities.
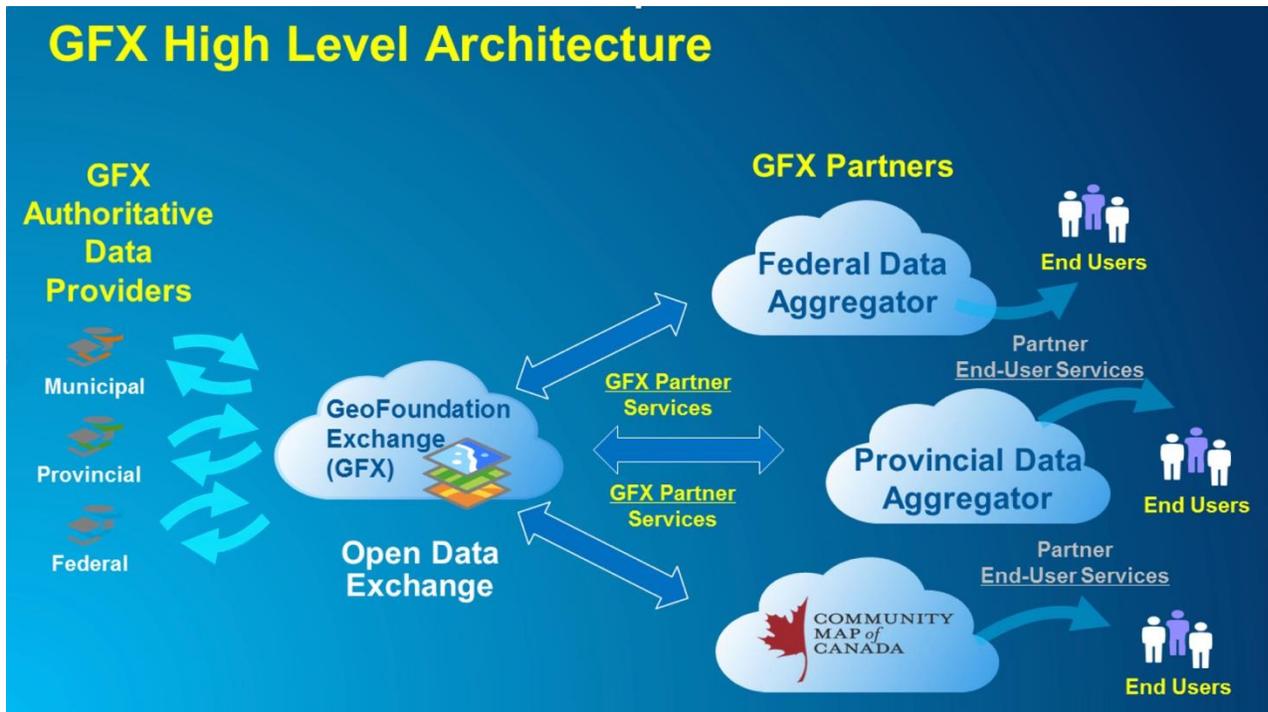
There is a strong case across Canada for a modern collaborative base map data exchange solution that meets the needs of the entire community – both inside and outside of government. More than enough money is collectively spent on current duplicative and disparate mapping efforts to fund a modern collaborative solution. It is time for a new approach.

The GFX is a multi-participant initiative that enables base mapping producers at all levels of government to efficiently collaborate for their mutual benefit – helping these organizations create base mapping products that are more accurate, current and complete. The GFX focuses on the authoritative sources of base mapping data from all levels of government, capturing changes as they take place. Changes at these sources are automatically detected and made accessible to other GFX participants as they occur.

The hosted, cloud-based architecture of the GFX allows participants from different organizations and levels of government to leverage a common infrastructure that complements their existing internal systems without interfering or displacing them. Participants from various municipal, provincial or federal jurisdictions can view each other's mapping data to ensure that they can connect spatially and avoid gaps and duplications in coverage. It also provides automated feedback to data sources to maximize data quality and ensure continuous improvement. At the provincial or federal level, existing data can be extracted from the exchange by a provincial or federal level data aggregator, and can be efficiently aggregated once - using a common mapping aggregation process (instead of multiple times by duplicative mapping activities) - into useful mapping products and services for provincial or federal level end users inside and outside of government. As an Open Data Exchange, the GFX will help accelerate and expand Canada's Open Data initiatives for the benefit of all Canadians.

The GFX is a work-in-progress and is being advanced through a series of pilot projects to build and demonstrate the tools and processes required to modernize Canada's base mapping. Funding has come from Esri Canada, NRCan and provincial pilot projects. The GFX is governed by a steering committee comprised of representatives from the federal, provincial and municipal governments, as well as Esri Canada and other stakeholders. GFX Working Groups have been established to address governance, communications, content and workflow. The Steering Committee meets bi-monthly by teleconference and face-to-face about every 18-24 months. Esri Canada uses the GFX to optimize the production of its Community Map of Canada and invites other provincial and federal level mapping organizations to also benefit from the GFX to optimize their own base mapping activities.

The GFX is a complex, multi-participant undertaking. The data sources for base mapping are many and varied. In the past, a collaborative solution that leverages these existing mapping data sources and supports efficient municipal/provincial/federal-level coordination and data aggregation was technically difficult. However, modern cloud infrastructure and Web mapping technologies have eliminated these technical challenges. Moreover, the widespread and growing adoption of open data licensing policies by data source organizations is eliminating many of the data usage restrictions that have prevented effective collaboration in the past. This fusion of technical and licensing advancements, coupled with increasing requirements across all sectors to collaborate to reduce costs and increases productivity, are the driving forces behind the GFX.

There is a strong case across Canada for a modern collaborative base map data exchange solution that meets the needs of the entire community – both inside and outside of government. More than enough money is collectively spent on current duplicative and disparate mapping efforts to fund a modern collaborative solution. It is time for a new approach. The GFX would reduce the collective costs on current, duplicative efforts and would allow organizations to focus their efforts on activities that are core to their operations, which for many is not mapping. In addition, a modern, open base map data exchange solution would enable better, more up-to-date products to the wider range of end users across many sectors of the Canadian economy – all contributing to increased productivity, competitiveness and innovation for the benefit of all Canadians.

For more information about the GFX, please contact:

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