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## Modernizing Land Administration in Barbados: MNC Delivers a National Digital Parcel Fabric

Effective land management and governance in any nation requires a robust and reliable cadastre, the foundational record of land parcels, boundaries, and ownership. In 2018, the **Government of Barbados (GoB) set out to modernize its approach to land administration** in support of the Barbados Economic Recovery and Transformation (BERT) Plan. The goal was to enable sustainable and inclusive economic growth while ensuring the resilience of social and financial sectors.

A key initiative was the development of the **National Digital Parcel Fabric (NDPF), a unified, digital representation of all land parcels on the island.** This project was the result of successful collaboration between the Ministry of Industry, Innovation, Science and Technology (MIST), the Lands and Surveys Department, and **MNC (Martin Newby Consulting Ltd.)**.

All active land tax parcels as of August 2022 in Barbados, exceeding **124,000 parcels**, were mapped using the highest-quality source data and survey control, and integrated into Esri's Parcel Fabric for ArcGIS Pro. Extensive quality assurance (QA) ensured data consistency and reliability.

Today, this single, complete, and trusted digital cadastre underpins Barbados' land administration ecosystem. It serves as a sustainable foundation within Esri's Parcel Management suite, enabling the Lands & Surveys Department and its GIS resources to maintain and share parcel data efficiently across land-related agencies. In effect, the **NDPF is now the graphical portal for access to land-related documents, e-services, and provides a reliable base for the integration of other GIS datasets.**



### CHALLENGE

Historically, Barbados' parcel database functioned as an internal document management tool for survey plans. However, as use expanded across multiple government agencies and decision-makers, **the system faced escalating demands that it was never designed to meet.**

By 2022, the Lands and Surveys Department under the Ministry of Housing, Lands, and Maintenance embarked on the NDPF project to reform the Land Information System (LIS) of Barbados. They wanted to address the following topological issues:

- **Scalability:** The legacy database struggled to keep pace with new users and requests.
- **Topological Errors:** Overlaps, gaps, and discrepancies between database parcel shapes (accuracy issues where the parcel shapes did not match those shown on the recorded survey plans).

- **Incomplete Records:** The system failed to ensure reliable, comprehensive records needed to fulfill departmental mandates and external customer service requirements.

To address these challenges, the NDPF project aimed to create a single, trusted, and sustainable digital cadastre covering every land parcel in Barbados by:

- Creating a fundamental layer for **delivering land-based e-services**
- Creating a fundamental layer that will form the basis of the **integration of various national land information datasets.**
- Lay the groundwork for a comprehensive Land Information Platform to help **advance GoB policy objectives for economic development and social progress** through land and housing.

## SOLUTION

MNC, in close partnership with the GoB, delivered a nationwide, sustainable digital cadastre using Esri's Parcel Fabric for ArcGIS Pro. The resulting parcel fabric now encompasses the entire island, accounting for more than 124,000 unique Land Tax parcels.

### KEY STEPS AND SERVICES:

- **INTEGRATION OF SURVEY PLANS:** Scanned survey plans were integrated into the fabric using coordinate geometry (COGO).
- **HEADS-UP DIGITIZATION** using georeferenced scans, supplemented with land valuation and tax records.
- **DATABASE INDEXING:** Each land parcel was entered into a database and assigned a uniquely defined reference number.
- **TOPOLOGICALLY CORRECT PARCEL FABRIC** adhering to rules provided with Esri's parcel fabric data model for ArcGIS Pro.
- **TRAINING & CAPACITY BUILDING:** MNC provided training to Barbados' staff, empowering them to maintain and update the digital cadastre independently.
- **FUTURE PLANNING:** High-level requirements were developed for an anticipated online plan checking and submission tool, paving the way for additional digital service enhancements.

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*Collaborating with MNC has been an excellent process for us. MNC's project management and clear communication approach made it easy for us to evaluate options and make informed decisions. They were quick to problem-solve and let us know the options and the impact of each.*

**MICHELLE ST. CLAIR** PROJECT LEAD, BARBADOS  
LANDS & SURVEYS DEPARTMENT

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# RESULTS

A parcel fabric is a comprehensive, digital representation of land parcels, property boundaries, and ownership information. The development of an accurate and reliable parcel fabric is paramount for enabling commerce in developing nations, like Barbados.

- **TRANSPARENT PROPERTY RIGHTS & OWNERSHIP:** In many developing nations, land ownership is often informal and lacks clear documentation. This new parcel fabric establishes a clear, authoritative record of land ownership, encouraging property investment, stimulating economic growth, and attracting foreign investment.
- **ENHANCED LAND TENURE SECURITY:** An accurate parcel fabric enhances land tenure security. With reliable data, citizens and businesses have greater confidence in their property rights, spurring further development and contributing to poverty reduction.
- **URBAN & INFRASTRUCTURE DEVELOPMENT:** Urban planners now leverage accurate parcel data to make informed decisions on land use, zoning, and infrastructure, guiding sustainable city growth.
- **TAXATION & REVENUE GENERATION:** Accurate records allow the government to assess property taxes fairly and efficiently, increasing revenue generation for public services and infrastructure.
- **LEGAL FRAMEWORKS & DISPUTE RESOLUTION:** Land disputes are common in developing nations due to ambiguous property boundaries. A parcel fabric serves as an impartial record of land boundaries, simplifying dispute resolution and reducing legal conflicts.
- **IMPROVED ACCESS TO CREDIT:** With a parcel fabric, individuals and businesses can use their land as collateral to access credit from financial institutions. This access to capital facilitates entrepreneurship, investment, and economic growth.
- **NATURAL RESOURCE MANAGEMENT:** The parcel fabric supports sustainable management and conservation of agricultural and environmental resources.

- **FOREIGN INVESTMENT & TRADE:** Clear property rights, enabled by a parcel fabric, attract foreign investors who seek secure land for commercial ventures. Additionally, accurate land records facilitate cross-border trade and investment, boosting economic development.
- **RURAL DEVELOPMENT:** In rural areas, a parcel fabric can lead to equitable land distribution, empowering smallholder farmers and improving agricultural productivity. This, in turn, reduces rural poverty and contributes to food security.
- **FACILITATING INFRASTRUCTURE PROJECTS:** Accurate, up-to-date parcel data streamlines planning for roads, utilities, and other projects, minimizing costs and delays.

## GLOBAL PERSPECTIVE

Many governments around the world continue to struggle with outdated or incomplete parcel data and lack the resources or expertise to modernize their systems. While challenging to implement and maintain, the value of a single, comprehensive, and trusted digital cadastre is immeasurable, providing benefits that far outweigh the required effort.

MNC brings proven expertise to support any jurisdiction in upgrading its parcel fabric systems no matter the initial condition, delivering sustainable improvements to land administration and management.

## MNC SERVICES & TECHNOLOGY USED

### SERVICE CATEGORIES:

- Parcel Fabric
- Needs and Requirements
- GIS Planning and Strategy
- Data Model and Database Design
- Data Conversion / Migration
- Training and Support Services
- ArcGIS Pro Migration

### TECHNOLOGY PLATFORM & TOOLS:

- ArcGIS (Esri)
- FME (Safe Software)



**CONTACT US TODAY** to discuss your geospatial needs.

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**ABOUT MNC**  
The Cadastral and Parcel Mapping Experts



MNC is a trusted leader in cadastral and parcel management with 25+ years of experience delivering GeoAI-ready datasets, modernizing parcel fabrics, and automating GIS workflows. As an Esri Gold and Cornerstone Partner with a Parcel Management Specialty and State and Local Government Specialty, MNC provides scalable advanced GIS, ArcGIS Pro, FME automation, MicroStation, AutoCAD and cloud-ready geospatial systems that improve data quality and support government land administration modernization across Canada, the USA, and the Caribbean.





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