

# **GIS Case Study for a Fiscal Cadastre and Improved Land Tenure in The Bahamas**

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**Key words:** Cadastre, GIS, Land Registration, Land Administration, Real Property

## **SUMMARY**

A gradual paradigm shift is being experienced in the Bahamas. The need for information is now heightened and has resulted in a Pilot Study being carried out in a small area of the Country. This has unveiled both the advantages and disadvantages of the GIS science and technology. Using the limited existing labour on hand, a skills re-engineering campaign was implemented to accomplish the task at hand. Staff members were trained in CAD, GIS, and database software to enable completion of the same. The results were quite suprising and recommendations for the maintainance of the program were proposed.

Despite the imperfections in the Land Tenure system of the Bahamas, the projections for increased revenue generation have deemed the Pilot Study a reasonable project. Additionally, the new way of producing and storing digital data for the “Fiscal Cadastre” of the Bahamas has sparked a new interest by agencies and private individuals. This paper intends to outline both the present and future benefit of the Pilot Study, while analyzing the impact of broadening the scope to a wider area (ie. A National Project). The effect of GIS in the Bahamas appears to be steamrolling ahead and the engine has gathered a great amount of speed.

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## 1. INTRODUCTION

The use of GIS in the Bahamas is issuing unprecedented change. The execution and analysis of the pilot project, which was carried out in the eastern part of New Providence Island, is discussed within this paper. The re-activation of the Bahamas National GIS Centre has

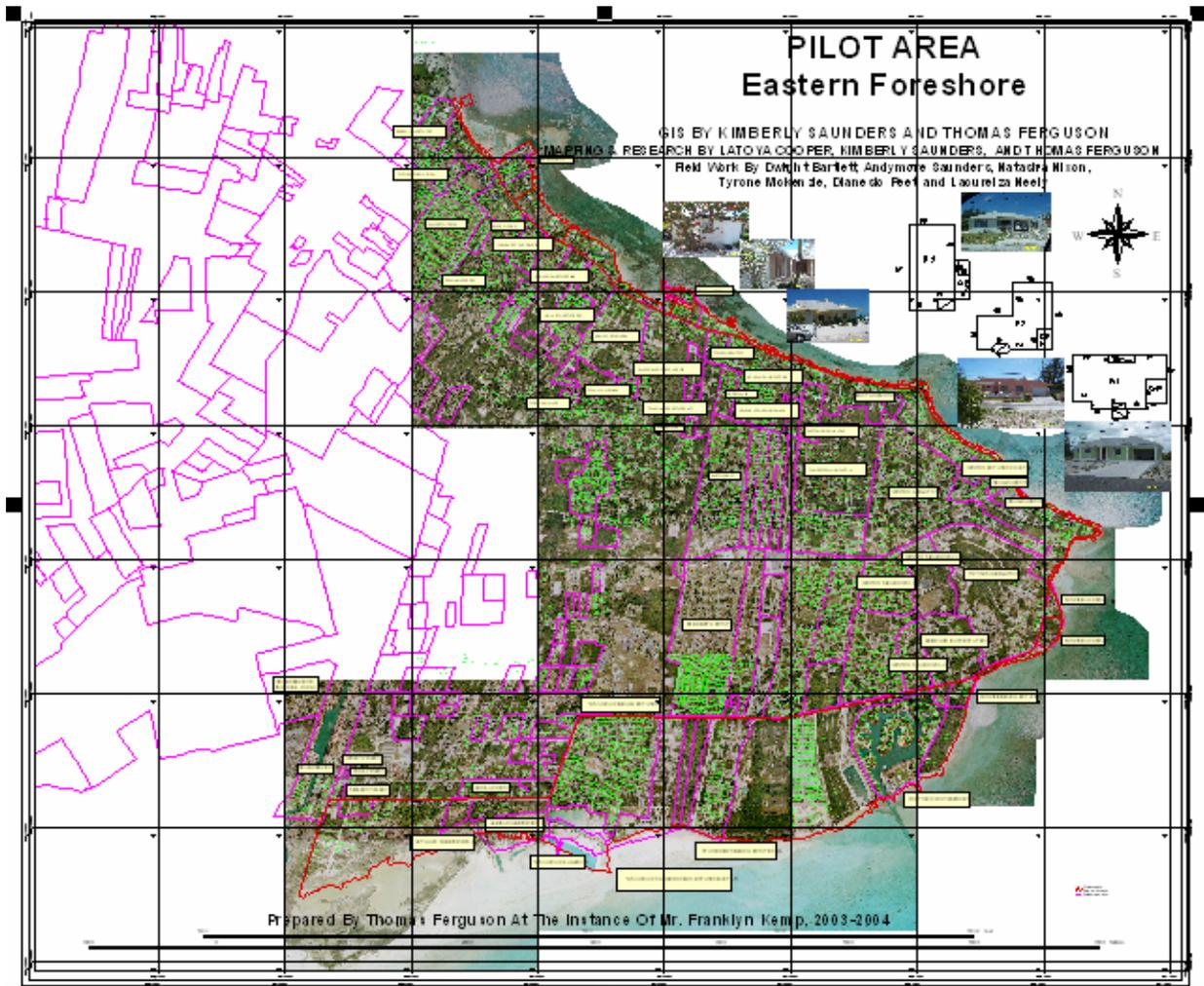


Figure 1 – Eastern Foreshore Pilot Project, New Providence Island

sparked a new interest in GIS from both agencies and individuals. The Pilot Project which involves GIS has great potential for the entire Bahamas. Was the pilot project successful? What does this mean for the overall implementation of the Real Property Tax initiatives?

Information on land and property is required more and more due to the real estate market and the numerous development proposals. The information must be current and accessible to facilitate the desires of the land market and policy makers. The transition from the existing Land Information System to a Computerised Cadastre may be the means to this end. Is a fully operational Computerised Cadastre achievable, and can GIS assist with improved Land Tenure?

The existing Land Tenure system also has some imperfections which limit the security of tenure and sometimes allows the eviction of legitimate title holders. New efforts have been initiated to combat some of the land issues which exist.

The manner in which governments deal with land affects society. The present Government's policies toward land tenure, Geographical Information Systems, and Taxation will provide the framework for increased security, reduced poverty, and good governance.

There has been a gradual shift from the "curtain principle" where everything was done under a veil of secrecy. The era of change is being molded through bold new initiatives which are in motion like those proposed under the Land Use Policy and Administration Project.

## **2. COUNTRY PROFILE**

The Commonwealth of The Bahamas is an Archipelagic State comprising approximately 700 islands and cays with 30, more or less, being inhabited. According to the 2000 Census, the Bahamas has a population of 303,611. The Bahama Islands and cays have a total area of 5,382 square miles scattered over 100,000 square miles of sea. Geographically, the Bahamas shares borders with the USA, Cuba, Haiti, and the Turks and Caicos. Its proximity to Florida, approximately 60 miles south-east of the Florida's coast, has been a major benefit.

## **3. BACKGROUND**

Taxation by governments should be transparent, fair and not overburdensome. The balance should be maintained to ensure that one does not tax their citizens so much that it creates a condition of economic decline (poverty). Taxation has traditionally been an instrument to limit speculation, spur development and increase economic activity (greater yield per square foot). It has also provided necessary revenue for civil/infrastructural works, educational, and social programmes.

In response to complaints of unfairness, the Eastern Foreshore Pilot Project was conceived to ascertain the existing inequalities of the present tax system. Additionally, a proposed re-assessment project was about to begin and this Project would provide some important results and projections for the larger re-assessment project for the island of New Providence.

## 4. LAND TENURE AND LAND ADMINISTRATION

### 4.1 History of the Bahamas' Land Information System

The Land Information System (LIS) which prevails in the Bahamas is mainly discreet in nature. Many records exist about land and property rights, however they are often stored manually in files, large manual books of documents in volumes, or archived on microfilm. Computerisation of these types systems has provided a challenge to many countries. Developing countries, like the Bahamas, are at an even greater disadvantage as they may not have access to the resources available to developed countries like the USA, Canada, England, and others.

It is noted that many of the same experiences can be transferred between countries with some degree of customisation for geographical region, culture, and maintenance of the status quo. The LIS of the Business Licence/Valuation Unit (BLVU) was a bit antiquated and needed a makeover. It appeared that there were some inequalities in addition to some omissions. Thus, a pilot project was devised to ascertain an indication of the benefits, limitations and imperfections of the current LIS.

Figure 2 – Manual Filing System (BLVU)



### 4.2 What Are The Traditional Forms Of Bahamian Land Tenure?

Land Tenure is described as “...*the mode in which rights to land are held, based on statutory law, common law, and customary traditions*”[van der Molen and Mishra, 2006]. With deeply embedded roots in English Common Law, Land Tenure in the Bahamas follows the three main accepted classifications: (a) freehold; (b) leasehold; and (c) customary tenure.

Freehold Tenure, possible after 1846, is characterised by a deed or bundle of documents. Freehold title holders (of Private Deeds, Registered Deeds, Crown Grants, or Certificates of Title – granted by the Supreme Court) can use and dispose of the land as they please including giving it away or passing it to one’s heirs.

Leasehold Tenure is the right to use the land for a defined term of years. Private Leases can extend say from 1 to 99 years, while Crown Land or governmental leases are as follows: 1 year *annual tenancies* (licence of occupation); 1 year *jetty licence* (rights to the sea bed); 3 – 10 year *conditional purchase lease*; 5 – 21 year *agricultural lease*; and 10 – 21 year *commercial and industrial lease*.

“Customary Land Tenure is inconsistent with private ownership, and is defined by the communal use land” [Ferguson, 1998], devoid of physical documents with particular emphasis paid to local customs. Commonage Land, regulated by the Commonage Act, is

communal land held by 20 or more inhabitants and descendants of a particular settlement. The District Commissioner administrates the register of “Commoners”.

A special committee of the House of Assembly (Bahamian Parliament) was established to address land issues and in particular commonage. The committee chaired by the Minister for Cat Island, reported to the house that there was no legal basis for commonage and that the Government would seek to abolish commonages allowing marketing of titles by the Crown to developers. However, it was noted that existing occupants would be regularised.

**“Generation Property”** is a cultural type of land tenure which is quite common with many families in the Bahamas. “Generation Property usually evolves from privately owned land which is not administered through the courts, by the descendants, upon the death of the fee simple owner” [Ferguson, 1998]. Successive deaths and lack of administration leave the property in a state of abeyance (non-vendible), despite continued occupation by descendants.

### **4.3 Squatting and the Quieting of Titles Act**

**“Squatting”** and **“Forced Eviction”** of legitimate title holders to the land has been directly influenced by the Quieting of Titles Act. This Act wields a double edge sword in that it creates insecurity by allowing squatters (often unscrupulous, greed driven individuals) prescriptive rights while denying legally documented owners (often too poor to prepare an adequate legal defense). Yet on the other hand, the final Certificate of Title which is granted is finite, conclusive, and marketable. Thus one can easily visualise the great hypocrisy when a squatters’ claim of occupation, no matter how fraudulent, succeeds over deed – bearing owners who have struggled to barely pay for their titles and are now forced to leave or give up land which provided them security.

The United Nations (UN) Commission on Human Settlements (HABITAT) Global Campaign for Secure Tenure commenced in December 2005. The Campaign purports that insecure tenure undermines long term planning, inhibits investment in housing, promotes social exclusion, reinforces poverty, adversely affects women and children, distorts the prices of land and services, and hinders good governance. The UN recognises “forced eviction” as a gross violation of human rights – determined by the Universal Declaration of Human Rights, 1948.

In recent times, squatting has sparked public outcry in two major instances. The first involved the Minister of Housing who successfully enforced the removal of illegal squatters from Crown Lands which were designated for housing projects in the Carmichael Road area of New Providence Island. The second involves the potential displacement of an entire community, known as “Bozene Town” bounded to the north by Harrold Road on New Providence Island. A single company was granted the entire area, through a successful Supreme Court quieting action, and the residents are seeking possible governmental intervention despite the recent court ruling.

#### **4.4 Conveyancing and Registration of Deeds**

Private or Notarial Conveyancing is the prevailing method of Land Transfer in the Bahamas. The owner is compelled under the Law of Property and Conveyancing (Condominium) Act to prove succession of title (“*root of title*”) for a period of 30 years.

The existing system of record rights in land is Registration of Deeds (ROD). Based on the Mirror Principle, ROD is not curative and merely mechanical in nature by recording all documents which are lodged with simple checks for omitted signatures and dates.

It is advisable, but not compulsory, for owners to record their documents on the general register under the Registration of Records Act. ROD adds a greater degree of security as registered deeds have priority and can only be challenged by litigation.

#### **4.5 Administration of Estates and Inheritance**

The foremost of all the acts which relate to death, inheritance and the administration of estates is the Real Estate Devolution Act. Succession of tenure or disposal of land is allowed according to the prescribed terms of a Legal Will. Previously, if one died intestate (without a will), the common law rule of primogeniture prevailed where the eldest lawful son inherited the estate. If no heirs can be found, the land reverts to the State and is vested in the Treasurer under the Escheats Act.

The “Sweetheart Bill” was passed, now called the Act which enables the wife, lawful children, and illegitimate children of a Bahamian man to each receive a portion of the estate. If children are not legally old enough, at the time of intestacy, to their administer their estate, a Supreme Court appointed trustee can act on their behalf as prescribed by the Trustees Act.

The Sweetheart Bill elicited much controversy and was intended to remove the restrictive life interest of the wife, called a dower (1/3 of the husband’s total possessions). Even though the dower was removed, the similar life interest of the husband, known as a curtesy, was practically non-existent.

Legal heirs of Tenants in Common inherit the proportional interests in land of their predecessors. On the other hand, the surviving partner in a joint tenancy retains exclusive possession of the property.

#### **4.6 Registration of Titles and the Fiscal Cadastre**

Registration of Titles (ROT) is similar to ROD with the main exception being that all documents must be registered and are scrutinised for authenticity and integrity. The owner, property description, measurements (size and area), property rights (easements, profits, and others), and charges (liens and mortgages) are recorded on the general ROT register with absolute finality. Due to the certainty of this type of system, the State guarantees the title to

the land. A bill for Registration of Titles in the Bahamas was submitted to parliament in 1967, but it was never passed.

Documents recorded in a ROT system also have a survey plan attached which is lodged with the Surveyor General in finality so that there is no encroachment or squatting. There is a general register of survey plans, called the Master Survey Drawing (MSD), which is prepared at relevant scales. The Fiscal Cadastre is similar to the ROT system but was formulated on the basis of Taxation. Thus the elements of land use and value are foremost and dictates the inclusion of some elements in a multiple listing service (building size, age of building, zoning, improvements, and others).

The system which is in place at the BLVU mirrors a Fiscal Cadastre because it lacks the compulsion element for recording deeds and documents. It is well suited for easy implementation of a Fiscal Cadastre with a smooth transition from the old to the new system. However, a ROT system must be enacted by parliament.

#### 4.7 Modern Cadastres

Modern Cadastres embrace wholeheartedly the concept Interoperability – the use of information which is exchanged between two or more systems which possess the ability to perform such an exchange. Interoperability varieties include: (a) semantic – comprehending terms and concepts; (b) human/political – training initiatives and governmental policies; and (c) technical – software interaction, format, and machine inter communication. Standards for Metadata (eg. ISO 19115, Dublin Core, FGDC), equipment, and software are also key elements of modern day cadastres. Optimistic and pessimistic locking of the databases occurs, depending on the architecture of the system, while “altruistic locking” is envisioned by some as the future of cadastres..

#### 4.8 Real Property Tax

In the Caribbean, the most popular methods for Taxation of properties are based on “...the rental value and the market value...”[dos Santos and Bain, 2004]. Some Caribbean Countries use Site Value or some other means which may include a combination of methods.

An analysis of other jurisdictions in the Caribbean and developed countries like the USA has proved that the applicable rates are both reasonable and fair. The BLVU utilises “Market Value” for the application of its tax rates below:

| <u>Owner Occupied</u>    | <u>Other/Commercial</u> | <u>Vacant Land</u>     |
|--------------------------|-------------------------|------------------------|
| First \$250,000 (exempt) | First \$500,000 @1%     | First \$3,000 =\$30.00 |
| Next \$250,000 @3/4%     | Balance @2%             | Next \$97,000 @1%      |
| Balance @1%              |                         | Balance @ 1 ½          |

Property Taxes were the 4<sup>th</sup> highest source of Bahamian revenue in the periods 2001/2002 and 2002/2003 accounting for approximately 4% of overall revenue. The tax revenue of 4%

compares reasonably to the following countries and accounts for the respective percentages: Netherlands – 47%, Poland – 13%, Slovak Republic – 11%, Republic of Estonia – 3%, and Czech Republic – 3%.

Bahamian Property Tax Revenue, as a percentage of the Country's GDP, was the 3<sup>rd</sup> highest property tax revenue in the Caribbean following Barbados and Grenada sequentially.

#### **4.9 Land Administration Tools**

The main instruments for Land Administration Systems are Mapping and Adjudication. Land Administration in the Bahamas will involve primarily a Land Information Service for prospective users. Both instruments will maintain the status quo and capture the existing rights in land.

##### **4.9.1 Mapping**

The main purpose of Mapping is to create a geo-reference for an object to which property rights are being claimed. It must be noted that no new rights will be created during the mapping process.

Why not continue with Manual Mapping? This a pertinent argument as it has worked well for so many years and most primary data providers (Land Surveyors) enjoyed a particular comfort zone. However, the use of digital data in the Bahamas has been proven to be: more applicable to a variety of subsequent uses; easier to modify and update; cheaper to maintain and archive; and easier to distribute.

Digital Mapping in the Bahamas initially suffered from bad GIS consultancy, the de-activation of the BNGISC, and bad data. The IDB recently entered a co-funding agreement, with the Government of the Bahamas, to attempt to provide better parcel based Mapping for New Providence and Grand Bahama. This pilot study, part of the Land Use Policy and Administration Project (LUPAP), if found to be successful, would form the basis for an extended Parcel Index Map (PIM) and comprehensive Land Use Policy for the entire country.

LUPAP requires the cooperation of three key governmental agencies namely BLVU, the Registrar General's Department (RGD), and the Department of Lands and Surveys (DLS). The success of the Project depends on their institutional strengthening and collaboration.

##### **4.9.2 Adjudication**

Adjudication establishes existing rights in land absolutely and conclusively without creating new rights. The preferred method of adjudication in Compulsory Systematic Adjudication (CSA) where it can and should be implemented swiftly, inescapably, and systematically.

Sporadic Adjudication, piecemeal ascertaining of rights, would be less beneficial to the Bahamas than CSA despite its lower cost. The high costs of the initial register would most

certainly be offset by the simplified conveyancing process, certainty of ownership, and guaranteed titles.

#### **4.10 The Role of the Bahamian Land Surveyor**

The traditional beliefs and practices must continue to adapt to the new environment. The Bahamian Surveyor must be willing to shape the change as he/she is the primary data provider. The existing professionals should begin a re-engineering of their skills as some have already begun.

The transition from T2 theodolite and 200' steel tape surveys to Total Station and GPS was a slow progression. Many Bahamian surveyors now produce digital data and use digital data collection techniques. It is commendable how they have decided not to become dinosaurs in a rapidly developing era.

The Bahamas Association of Land Surveyors (BALS) now needs to establish a permanent committee on standards in the Bahamas. Who better to advise on standards than the primary data provider? Similarly, the FIG has a Standards Committee which is involved many standards organizations, like the ISO.

The Bahamian Surveyor should also become an advisor in the Adjudication process as surveyors tend to have an intimate knowledge of land. Thus, BALS should also create a committee on Adjudication. Long and short term strategies should be prepared by BALS.

#### **4.11 The Bahamian Real Estate Market**

The Real Estate Market in the Bahamas has made a gradual progression from a “buyers market” and is presently a “sellers market”. Thus the demand for property is greater than the diminishing supply of land. Land is seen as the key economic source of wealth and should be used highest and best use – maximally productive. A totally “free and open” market could be detrimental to the most vulnerable in the Bahamian Society – the poor.

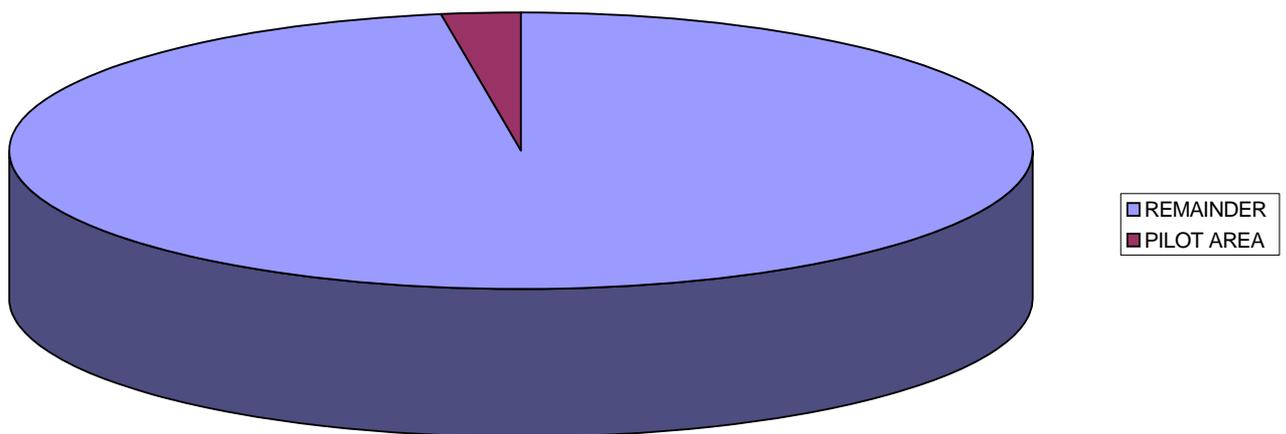
The World Bank Land and Real Estate Initiatives encourages governments to create accessible and efficient markets by developing regulatory infrastructures, re-engineering existing cadastres, and providing access to land for the poor. Thus governments are challenged to establish simple, cost effective, and comprehensive procedures for access to land information (standardised cadastre), credit for the poor, and clear definitions of land tenure and property rights.

In an effort to establish a balance regulations, the Bahamas Government has: (a) removed the stamp duty (transfer tax) on first time mortgages up to the market value of \$250,000; (b) eliminated real property tax on owner-occupied homes up to the market value of \$250,000; (c) maintained the restriction of Foreign Investment Board approval for lots more than 5 acres; (d) maintained the government guaranteed loans for low income housing (Ministry of

Housing and Bahamas Mortgage Corporation); and (e) allowed the Central Bank to relax the moratorium on consumer bank lending.

These are just some of the regulations and are complimented by comprehensive Land Use plans which have recently been accepted by the Bahamian Government. Price restrictions will be a new concept in the Bahamas and must be analysed for possible inclusion in future regulations. The delicate balance must be maintained which allows the poor to access credit and land in the Bahamas.

## 5. GOALS AND OBJECTIVES OF THE PILOT PROJECT



**Figure 3** Percentage of Pilot Area 2.43% of Total Island Area

The objectives of this pilot project were to: provide an idea of inequalities in the valuations of individual properties within the pilot area; implement the new equipment and technology and familiarize the staff with its use; provide new rates for the subject area; identify any problems and implement solutions to accomplish the task at hand; provide a test to enable some technical projections for the entire reassessment of New Providence within the anticipated 1 year epoch; and prepare recommendations to be forwarded in order to expedite the mandate of government, both in terms of expanding the Property Tax Revenue Base and improving the Revenue Collection.

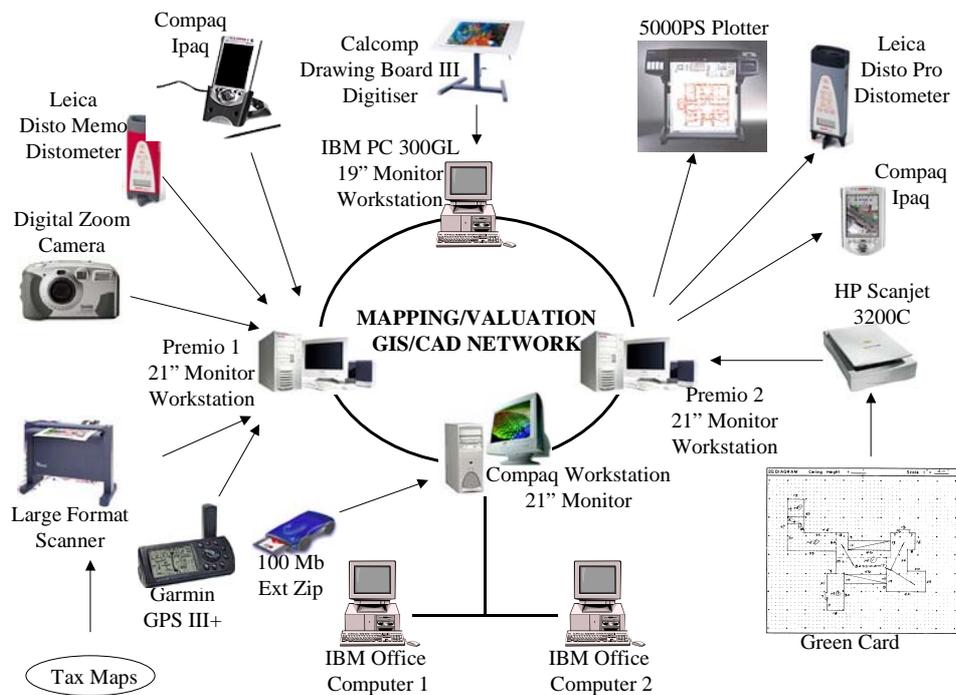
The project area (see Figure 1) comprised 2.43% of the total land area of New Providence and was executed over the period November 3, 2003 to February 19, 2004. Approximately 234 properties were included.

## 6. USE OF EXISTING LIMITED RESOURCES

All of the available staff (2 supervisors, 5 field officers, 3 office staff, and 1 mapping staff) in the Mapping/Valuation Section were used to complete this process. Two vehicles were available and this provided a particular challenge for both the field work and data collection.

The vehicles were shared between the 3 field teams, Mapping staff, and the regular Administration Team for the project. The staff was trained in CAD/GIS and digital equipment for the Pilot Project.

Some of the equipment, like the scanners, zip drive, and GIS software, was borrowed from other agencies in order to complete the task at hand. Also, privately owned software was used to advance the goals of the Pilot Project.



**Figure 4** Existing Equipment within the Proposed Mapping Network

The funds were limited and photocopying of subdivisions, plans, and maps was key to our success. This aspect provided a great difficulty as the manual process meant an officer had to go through each file, one at a time, to pull the maps, carry them for copying and return them to the custodian immediately. This meant that there was not sufficient time to have plan sent for 3 quotes as they were different sizes and we could not keep them in our possession too long. The present land system further limits data collection.

Also, each printing company could only copy a limited amount at any one time. This caused major delays and all of the Printing companies were used simultaneously. Further problems developed as their printing machines often broke down and it took weeks to repair.

## 7. DATA COLLECTION IN THE FIELDS

The data collected in the fields included: building dimensions, land and building use, building age, owners name and address, building type, survey plans, legal documents, and digital photos of the property improvements.

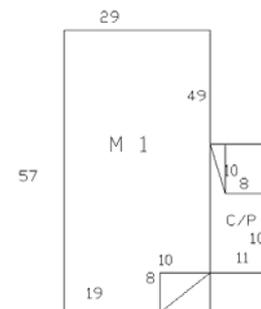


**Figure 5** Photo of a Typical Building

The field work produced some interesting results and we experienced quite a noticeable increase in values. The digital conversion of the data has revealed some inconsistencies in the plan and digital data. The need for technical skills was exemplified when consistent computer and network problems occurred. At the time, the Data Processing Unit (DPU) staff, whom we depended on heavily for support, were severely overstretched. Daily computer glitches were often never solved. Some equipment was borrowed and we were able to use them for a limited, one time loan.

## 8. RESULTS AND OBSERVATIONS

15 examples were analysed from the Pilot Area and the percentage increases in both their values and the taxes was quite alarming. The average percentage of property value increase in the selected examples was 314%. Average percentage increase in taxes was 451%. This has some major implications for the revenue collection of this Office. Owners were accommodated who wished to pay in installments, due to their inability to pay in full. The newly designed “Form C” was used to assist with owner inquiries and requests. CAD files were produced for the first time by the BLVU .



**Figure 6** CAD File

Responses from owners were not adequate or sufficiently timely. Many owners (majority of first time owners) were not aware of what was needed or required of them in relation to Property Tax. Those who were not home could probably be visited on the weekends, once the appropriate overtime is approved. Some of the field equipment needed additional components to operate better in the fields such as eyepieces for the distometers and battery/storage packs for the Ipac's. Supplies were often purchased out of personal funds just to ensure that the project was completed.

The process of Assessment/Reassessment should not be approached in isolation of the human element. They both, no doubt go hand in hand. Thus, it was discovered that a proper career path, promotions for existing staff, training initiatives, and attracting technical staff were some areas which needed closer attention. A proposed career path has been included with close reference to the existing job scales. Additionally, training is needed for at least 2 of the present officers in computer networking and support. This would enable us to handle many day-to-day problems on site.

## **9. SECURITY ISSUES**

The security of both the premises and the data would need to improve, as we collect more sensitive data. We may need to have better security for our physical location (for eg. coded locks, buzzers, etc.) and better backup for our data. The data security will be preserved by access protocols.

## **10. CONCLUSION**

The objectives were achieved as there were vast inequalities because of the disparity between the old and the new Market Values within the Pilot Project area. This was mostly due to the extended period (15-45 years in some cases) over which we have been able to execute a systematic reassessment. Most of the owners contacted had requested to pay their taxes by installments. Many owners were ignorant regarding Property Taxes, especially what is required. The "Form C" now assists with public awareness, but has only a limited effect. Public Awareness of Real Property Tax, with the assistance of the Media, will no doubt help with full compliance and better revenue collection.

The existing equipment was used and some produced the desired results while others needed additional parts. The new rates used were acceptable for both the Government and land owners. The projections for improved field conditions, inclusive of staffing and equipment have been proposed and the recommendations below have been prepared for easy perusal.

Efforts are being implemented at the executive and the technical levels to shape the change for the Fiscal Cadastre and eventually a Multipurpose Cadastre. Pilot studies have been pivotal to display to the executive branch the benefit of guiding the paradigm shift – which has future added benefits. The integration of BLVU initiatives and LUPAP will undoubtedly stroke the fire of change.

It is often intimated that it takes a generation to implement Registration of Titles. However, if we maintain the current momentum that we have gathered, we may slice the period in question in half. The Pilot Project was a success, however, any proposed Tax initiative cannot exist without the commitment of the Bahamian Government to fulfill the UN wish of ensuring the protection of the rights of poor legitimate land owners.

## **11. RECOMMENDATIONS**

It is recommended that:

- (i) Overtime be approved for Mapping/Assessment to visit property owners during the weekends. This would also allow for additional GIS/CAD updates and fieldwork which must be completed during this time. Also, inflation of tax collectibles would be limited.
- (ii) Overtime should also be approved for the hand delivering of bills and returned mail.
- (iii) Technically minded and trained staff to be hired and used to perform both the current work and the proposed re-assessment of the island of New Providence. This will make the

revenue generation even better as one can easily see the 451% increase in taxes over 5.43% of the Island.

(iv) A proper career path similar to the proposed career path should be implemented to motivate and retain the technical staff. There has already been investment into the current staff and promotions should be awarded them, both for the dedication they have displayed and to encourage their continued contribution to the Section. It is not too unreasonable to request salary increases as both the revenue and taxes have increased.

(v) The proposed operation diagram should be adopted for the practical implementation of Assessment/Re-assessment.

(vi) Installment payments should be enhanced (as needed) based on the owners' ability to pay.

(vii) A comprehensive media campaign should be initiated immediately to ensure compliance.

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## BIOGRAPHICAL NOTES

**Academic Experience:** Bsc (Hons) Surveying and Mapping Sciences, University of East London.

**Practical Experience:** Approximately 15 years practical experience working in the Cadastral field at various governmental agencies including the Ministry of Public Works, Department of Lands and Surveys, and the Valuation Section. Practical experience was gained in Identification, Mapping, and Assessment of Properties for Taxation, Production of Thematic Maps, Implemented CAD training courses for existing staff and new recruits, Project Management, Digital Elevation Models, and Road Design, Engineering and Land Acquisition Surveys for New Providence Road Improvement Project (Digital Data Collection by Total Station producing 3D data – x, y, z), Preparation of Engineering and Cadastral Survey Plans for Land Acquisition (Digital Mapping using CAD and GIS), Land Surveys for Compulsory Acquisition and Land Development Projects, Crown Land Subdivision Design and Layout, and Crown Land Surveys for land alienation.

Licensed Land Surveyor, Bahamas

Member, CaGIS – American Congress on Surveying and Mapping (ACSM)

Member, Geospatial Advisory Committee (GAC), Component 2 & 3 – Land Use and Policy Administration Project (LUPAP) Committee, Bahamas

Member, Project Advisory Committee (PAC), Component 1 – Land Use and Policy Administration Project (LUPAP) Committee, Bahamas

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