



Geospatial Technology in Jamaica

**Presented by
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Ministry of Land and Environment**

**High Level Meeting on the Use of Geospatial Technology
for Sustainable Development in the Caribbean**

March 18, 2004

St. Vincent



Presentation Outline

- GIS Use and Applications in Jamaica
- Lessons Learnt from GIS Development
- Challenges



The Jamaican Geospatial Environment

- Non standardized land records reference systems
- Inability to access timely & current land information
- Inadequate mechanisms for the transfer and sharing of information among Government agencies
- Sub optimal land use planning, land & environmental management and decision making





National GIS Vision

"A modern, comprehensive national GIS network, linking all land and land related agencies of government, that enables

- collaborative collection,
- sharing,
- maintenance and
- delivery of land and related information

to clients and the general public, to support effective and efficient planning, policy formulation, management of assets and decision making."



National Land Policy (July 96)

- Details National Policies and Strategies
- GIS identified as fundamental to effective management of land
- Speaks of
 - National GIS policies
 - Role of the Land Information Council of Jamaica
 - National Vision - National GIS Network



National GIS Policy Objectives

- Establish network, linking all land related agencies
- Develop National Standards
- Develop Human Resources in GIS
- Create national digital GIS databases
- Commit all Government Ministries to the NGIS
- Establish copyright and protective guidelines for creators of digital data



National GIS Strategies

- Stakeholder/Team Involvement
- Institutional/Partnership Arrangements
- Legislative Amendments
- Mentoring/Training Programmes
- Adoption/Adaptation of Standards
- Physical Infrastructure
- Data Infrastructure
- National Applications
- Public Education and Communication



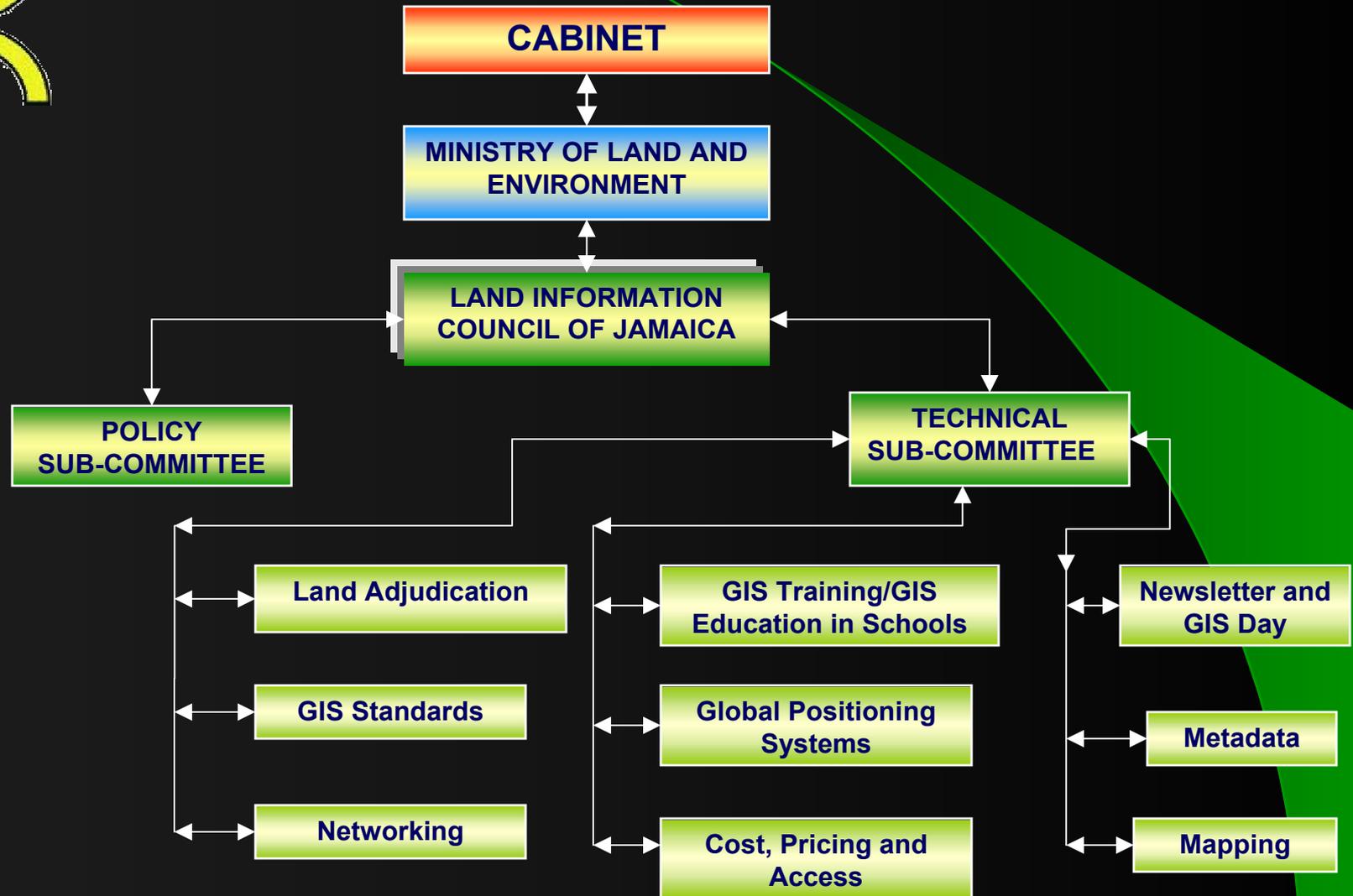
Land Information Council of Jamaica

The LICJ promotes the equitable use, management of land land land information through the collaborative efforts of land agencies, geared towards the promotion of national development and growth.

- The Council meets on the fourth Thursday of each month.
- Has membership of over 40 organisations,
- Work executed by 9 sub committees and a the National Spatial Data Management Division of the MLE
- Chaired by Mrs. J daCosta, Permanent Secretary, MLE



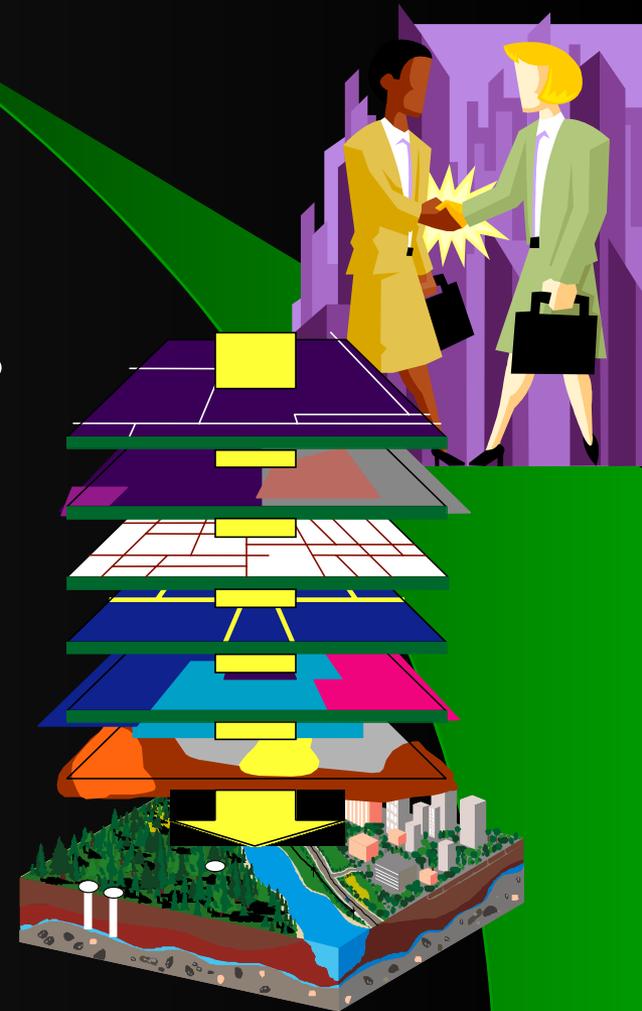
LICJ Structure





Current GIS Initiatives

- Data Infrastructure –
IKONOS & Cadastral Index Mapping
- Public Education –
LICJ Geoinformatics Training Centre, GIS
Education in Schools Programme
- Standards – ISO TC211- Metadata,
Arc/Info,
- Partnerships - Institutional Agreements
- National Applications – LAMP
- Physical Infrastructure – GPS Network



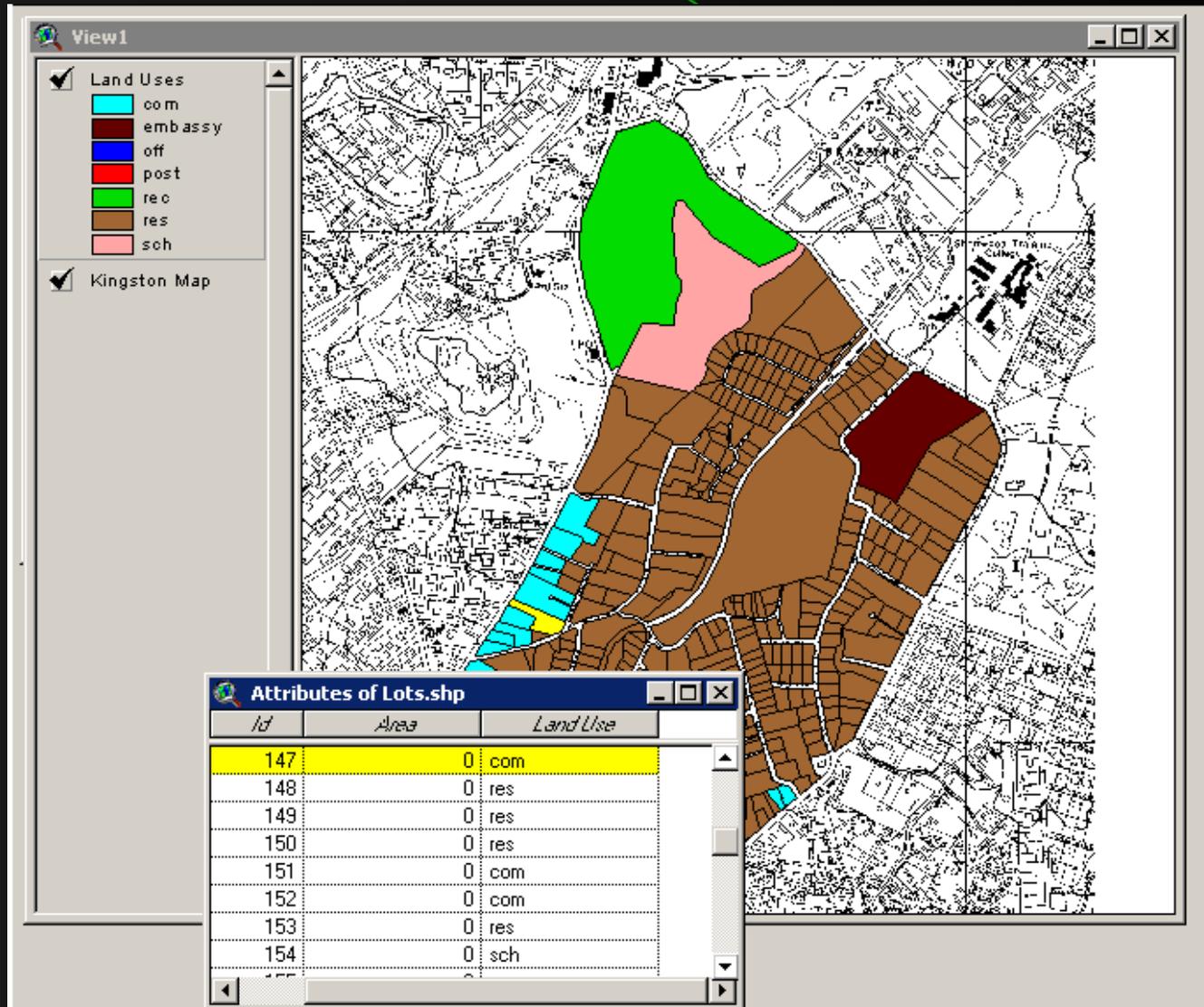


Identified National Applications

- i. data access and query system
- ii. project evaluation and tracking system
- iii. Subdivision review and tracking system
- iv. Building permit management system
- v. Parcel data management system
- vi. Base map management system
- vii. Demographic data management system
- viii. House numbering system
- ix. Government land management system
- x. Crime analysis system
- xi. Route analysis module



GIS SIMPLIFIES LAND USE MAPPING AND ANALYSIS



NWC USING GIS TO LINK IMAGES TO MAPPED DATA



ArcView GIS Version 3.1

File Edit View Theme Graphics Window Help

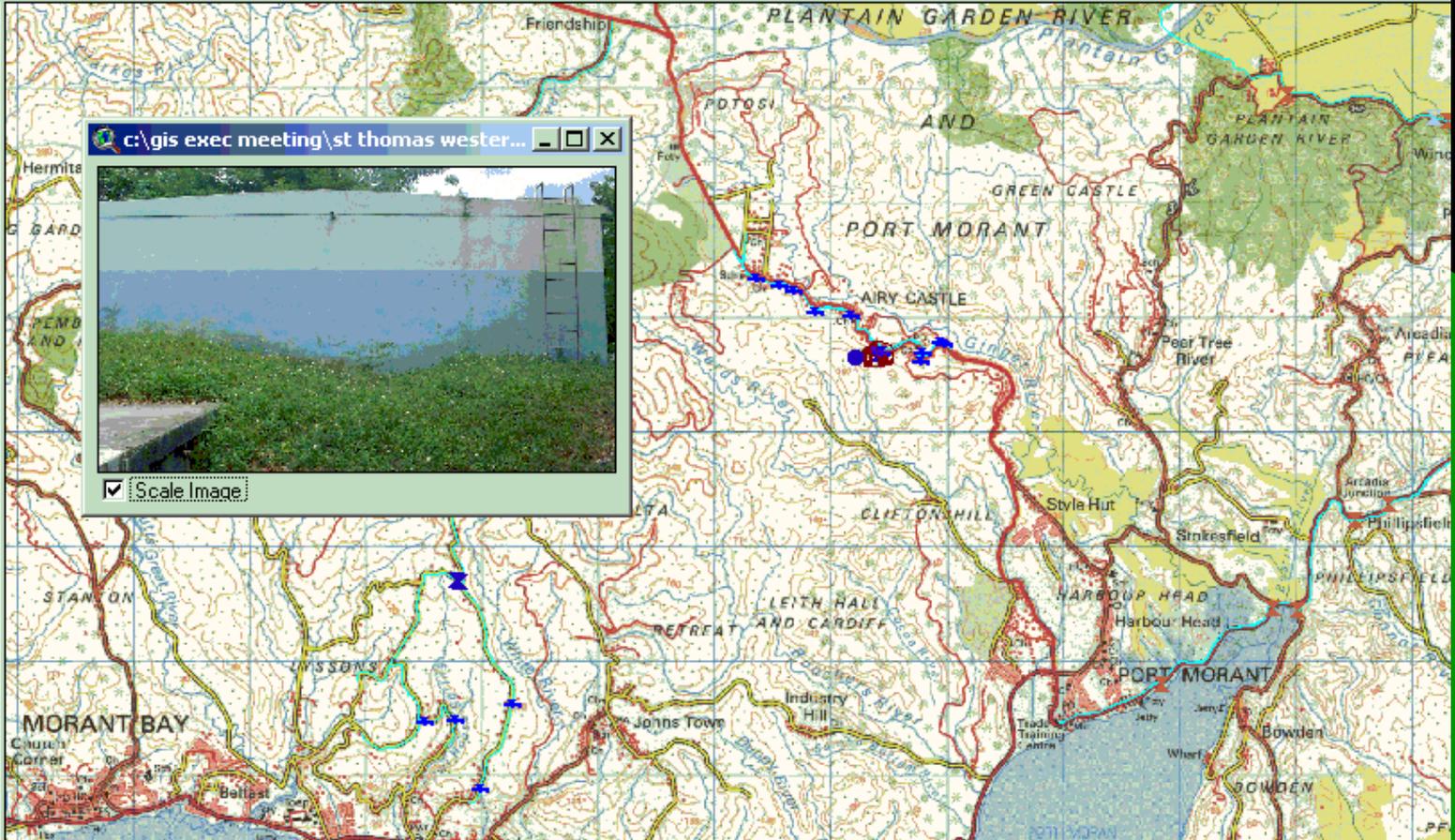


Scale 1: 58,235

31
14

st thomas western (wip)

- Hydrants
- Meters
- Standpipes
- Storage
- Stations
- Valves
 - Air
 - Gate
 - W as hout
- Pipe lines
- Topo map





Holistic Benefits of GIS

- Share Information & Increase Cooperation
- Help Foresee Problems & Devise Solutions
- Help to Resolve Conflicts
- Reconciles Conflicting Demands
- Shows Possible Compromises
- Helping Governments Act...
 - More Wisely
 - More Quickly
 - More Effectively



Creating Base Data Sets and Applications

- **Large Scale Orthophoto maps and IKONOS orthoimages**
- **IKONOS Precision Product at**
 - 1:4,800
 - 1 metre resolution
 - Island wide coverage
- **Large scale urban mapping**
 - 1:2,000
 - .3m resolution
 - Kingston, Portmore, Port Maria, Montego Bay & Spanish Town
- **Multi-spectral**
 - 1:4,800
 - 4m resolution
 - Island wide coverage

Mapping - Deliverables



This is an example of the high resolution and quality of the 1:2,000 OrthoPhotos. Figure 1 shows the Norman Manley International Airport with Airplanes on the ground. Figure 2 This image shows a dredging ship operation in the Kingston Harbour.

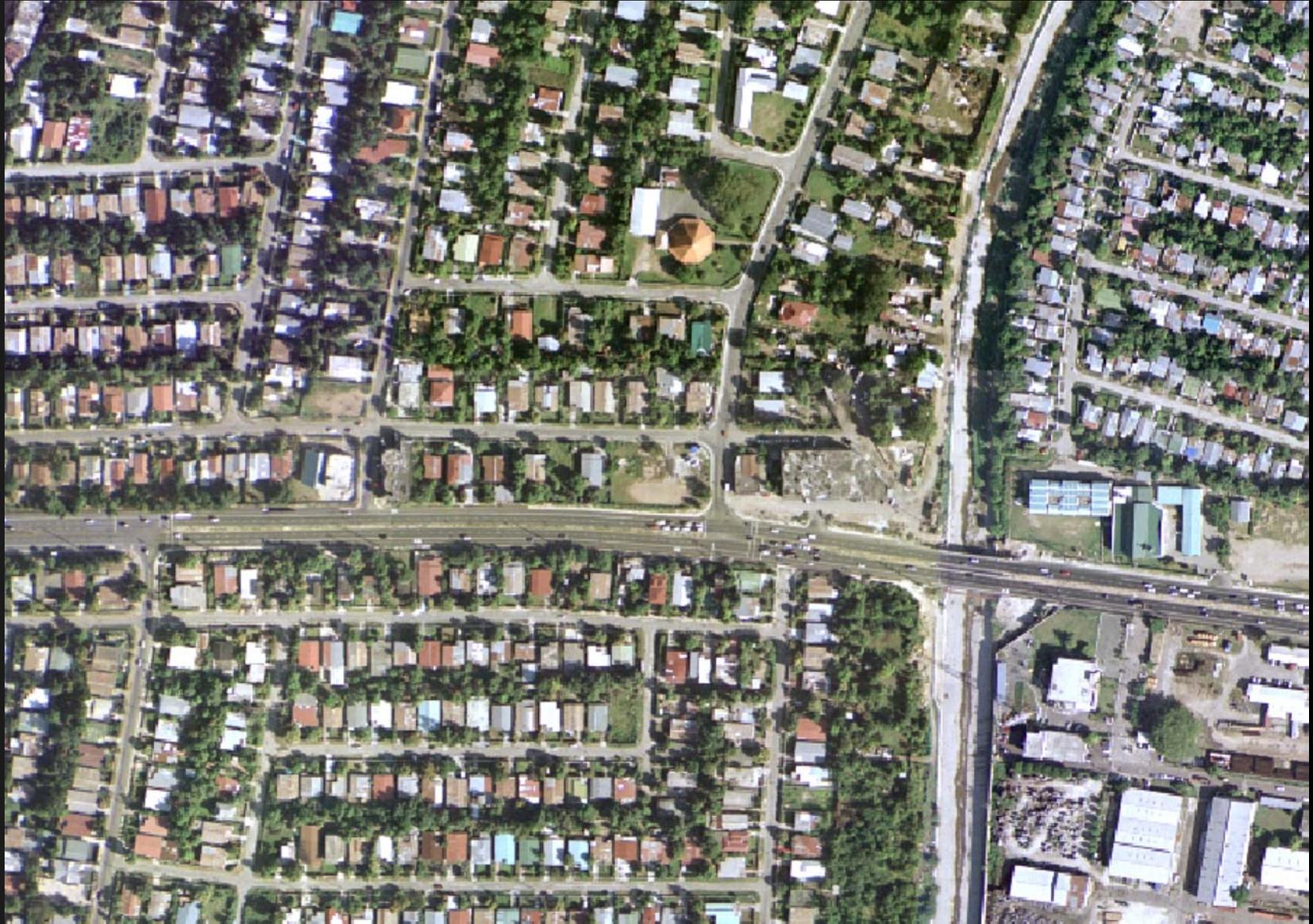


ORTHO PHOTOS AND IKONOS

Uses:

- **Agriculture** – crop damage assessment
- **Forestry** - measure rate & location of deforestation
- **Natural Resources** – flood plain analysis
- **Local Government** – monitor urban growth
- **Disaster Management** – emergency response planning
- **Transportation** – site planning & development studies
- **Telecommunications** – location of relay and cell site towers

Orthophoto Map – Part of Kingston





ORTHO PHOTOS AND IKONOS

Benefits:

- Comprehensive national map base
- Multiplicity of uses and users

The National Water Commission is using the maps to guide the laying of pipes in the Spanish Town and Bog Walk areas and to identify assets such as the pumps and wells. They are also using it to identify the location of customers, especially those in remote areas.



The Ministry of Health

GIS application, HealthGIS Jamaica.

It is used to capture, analyse and display health data. Injury and disease maps for the City of Kingston are being created using data from the Patients Administration System (PAS). The Ministry and other agencies such as the Jamaica Constabulary Force use the analysis being done to direct the appropriate intervention.



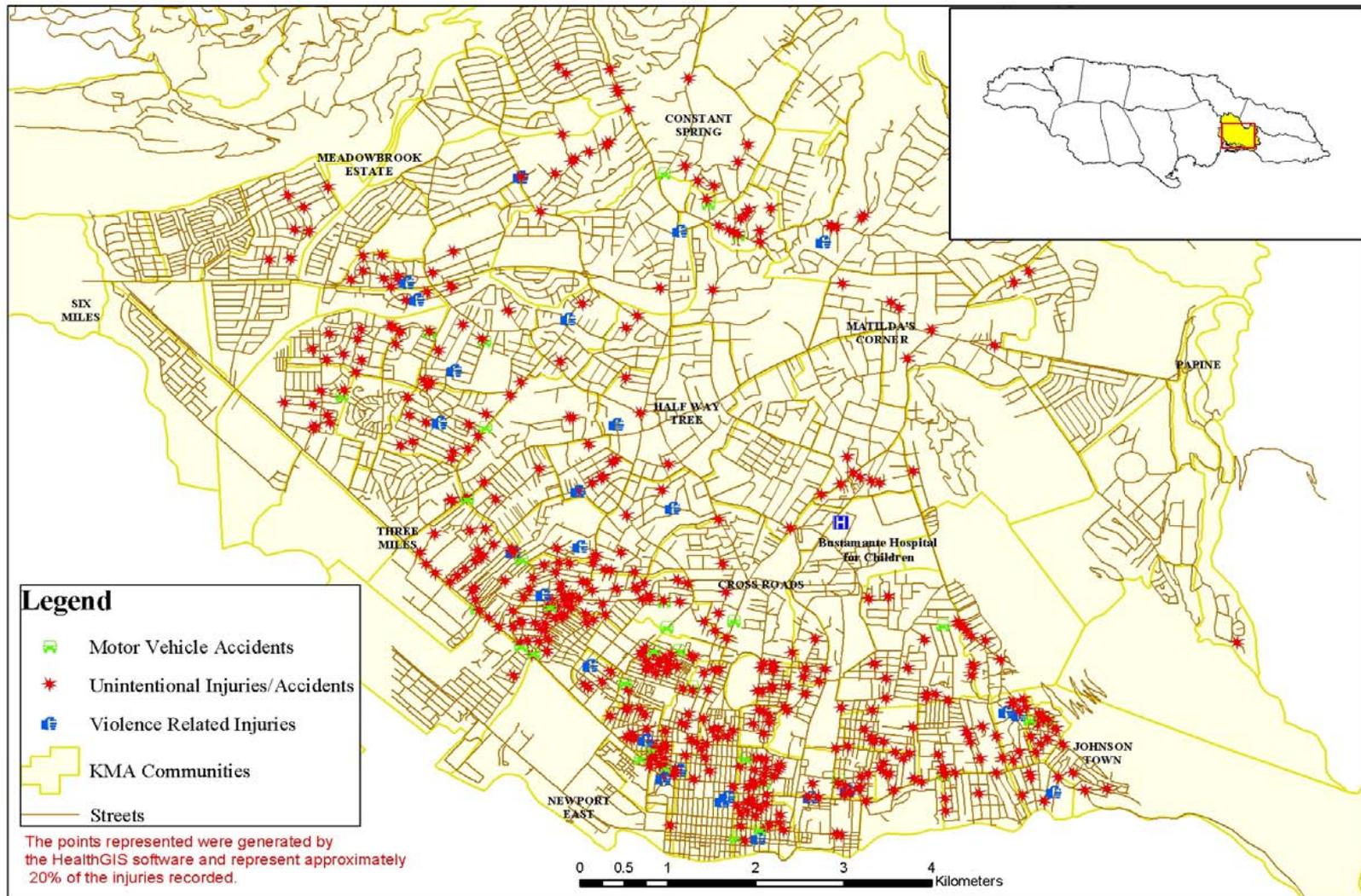
Health GIS

Ministry of Health
Government of Jamaica

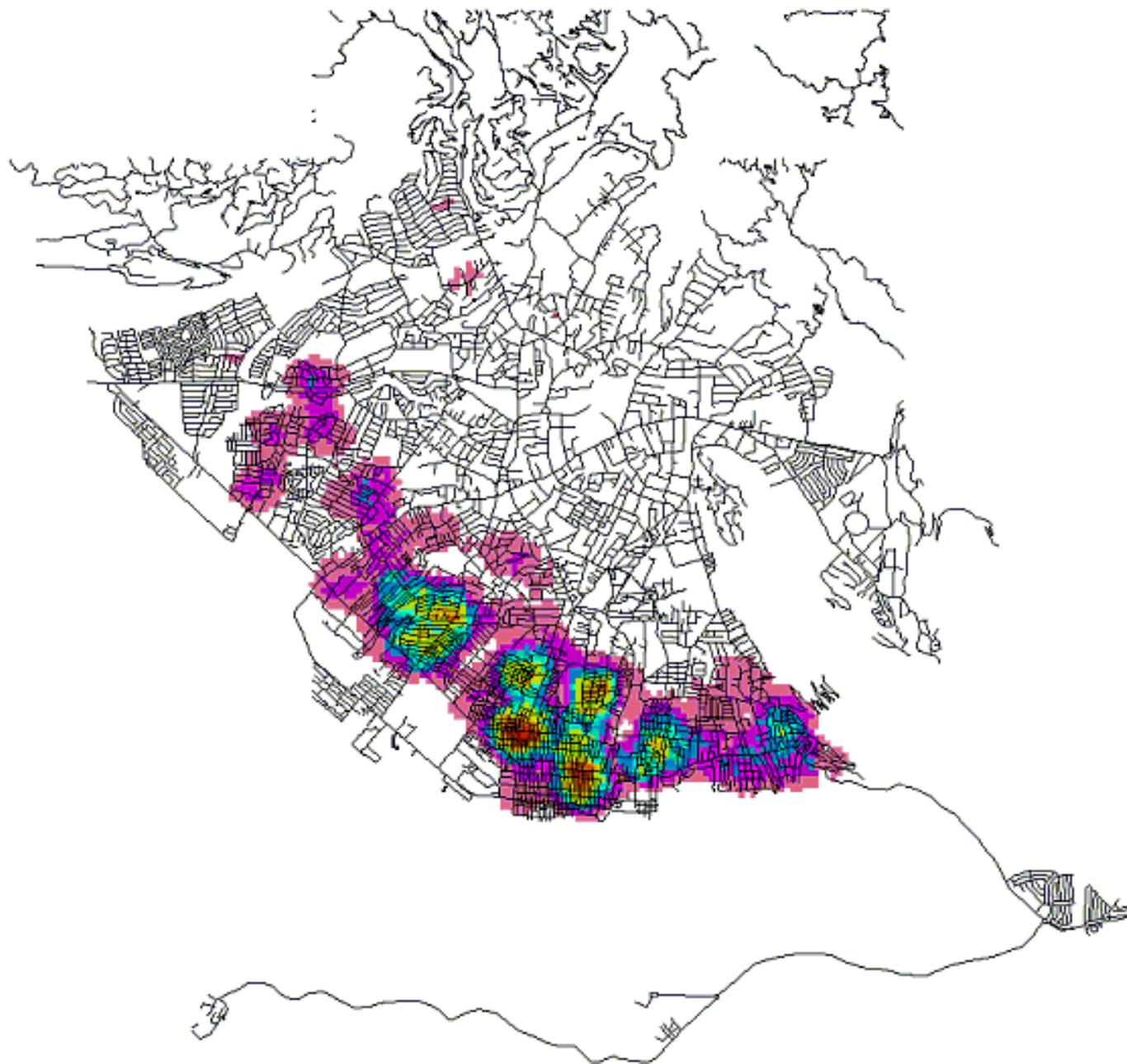
Supported by PAHO



APPENDIX 18B: A SAMPLE OF LOCATIONS OF SELECTED INJURIES IN THE KMA RECORDED AT THE BUSTAMANTE HOSPITAL FOR CHILDREN, 2002



DELINEATION OF INJURY HOTSPOTS, KMA

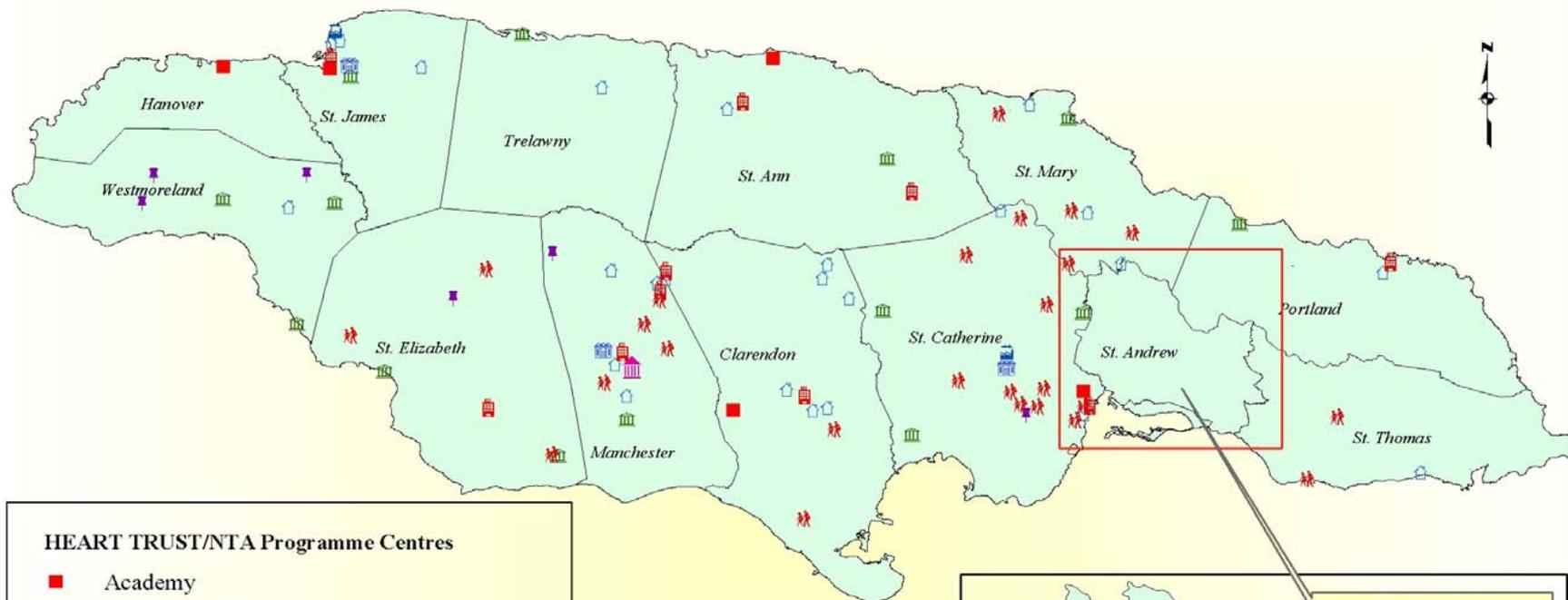




The Ministry of Education Youth and Culture

- created a spatial database of primary, secondary and tertiary government schools for the entire island.
- The data is used for school location planning, specifically for the North West Jamaica project to determine where 17 schools should be built in the greater Montego Bay area.
- Data sets of population growth, housing development patterns, land tenure, distance traveled by children to school were used in the GIS site selection exercise.

APPENDIX 22A: DISTRIBUTION OF POST SECONDARY AND TERTIARY INSTITUTIONS, 2002

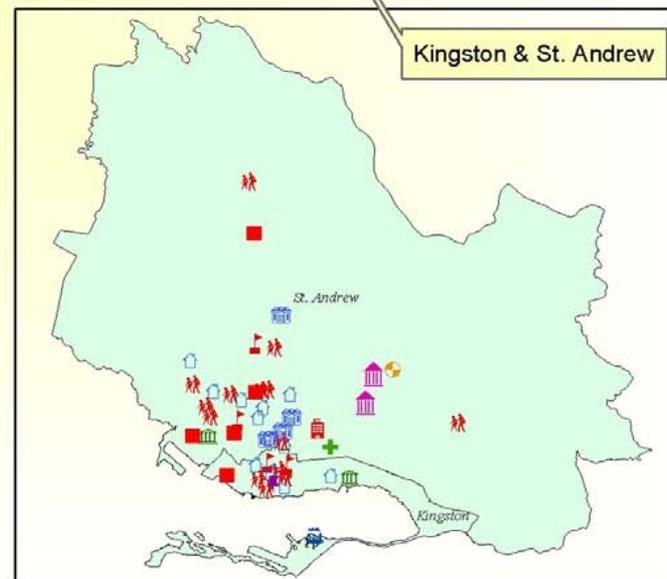


HEART TRUST/NTA Programme Centres

- Academy
- Community Based
- ▣ Industry Based
- ⊕ Other Special Programme
- ✂ Skills 2000
- ⊞ Social Development Commission
- ⚑ Special Needs Programme
- ⊞ Vocational Training Centre
- ⊞ Vocational Training Development Institute

Teachers' Colleges and Universities

- ⊞ Multi Disciplinary Coll.
- ⊞ Teachers' College
- ⊞ University

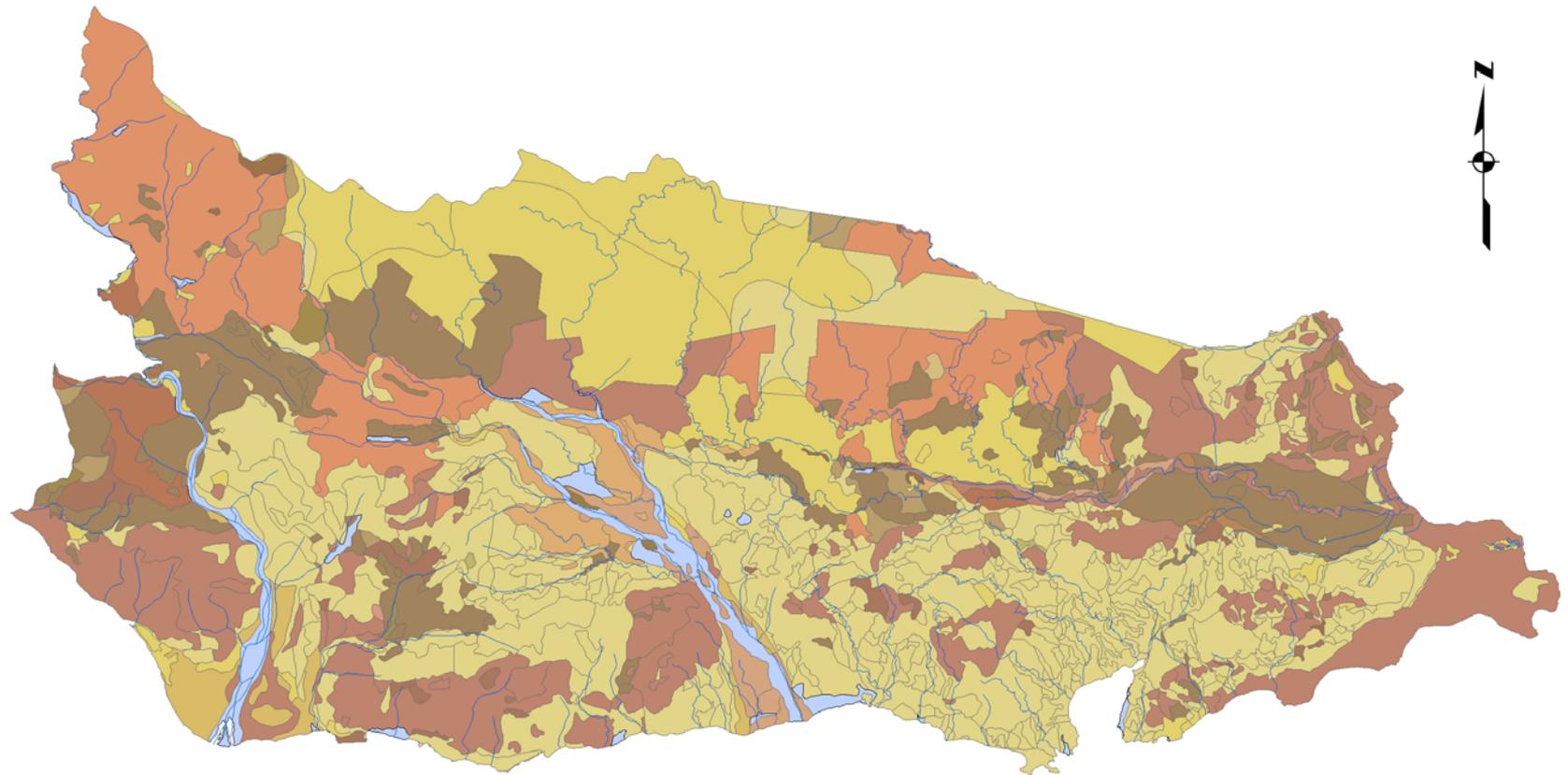




The Rural Physical Planning Unit

- the first government agency to implement GIS in Jamaica. They currently maintain a soil and land use database and a crop suitability database at the scale of 1:50,000.

ST. THOMAS - SOILS



Legend

river	clay	gravely loam	loam	silty clay	stony loam
TEXTURE	clay loam	gravely sandy clay loam	sandy clay loam	silty clay loam	stony sandy clay loam
river bed	fine sandy clay loam	gravely sandy loam	sandy loam	stony clay	stony sandy loam
chanery clay loam	gravely clay loam	ggravely sandy clay	silt	stony fine sandy clay loam	



The National Land Agency

- has developed a land information management system.
- In January 2003 the Agency introduced eLandjamaica. It is an internet based service that provides selected title, valuation and digital map information to the agencies customers that wish to subscribe



Welcome to eLandjamaica



Login

- I am a New User
- I am a Guest
- I am a Registered User:

Username: Password:

- I am Staff

[forgot password?](#)

Available Services

1. Basic Search
2. Valuation Roll Reports
3. View Title Documents
4. View Caveat Cards
5. View Deposited Plans
6. View Strata Plans
7. View Enclosure Plans

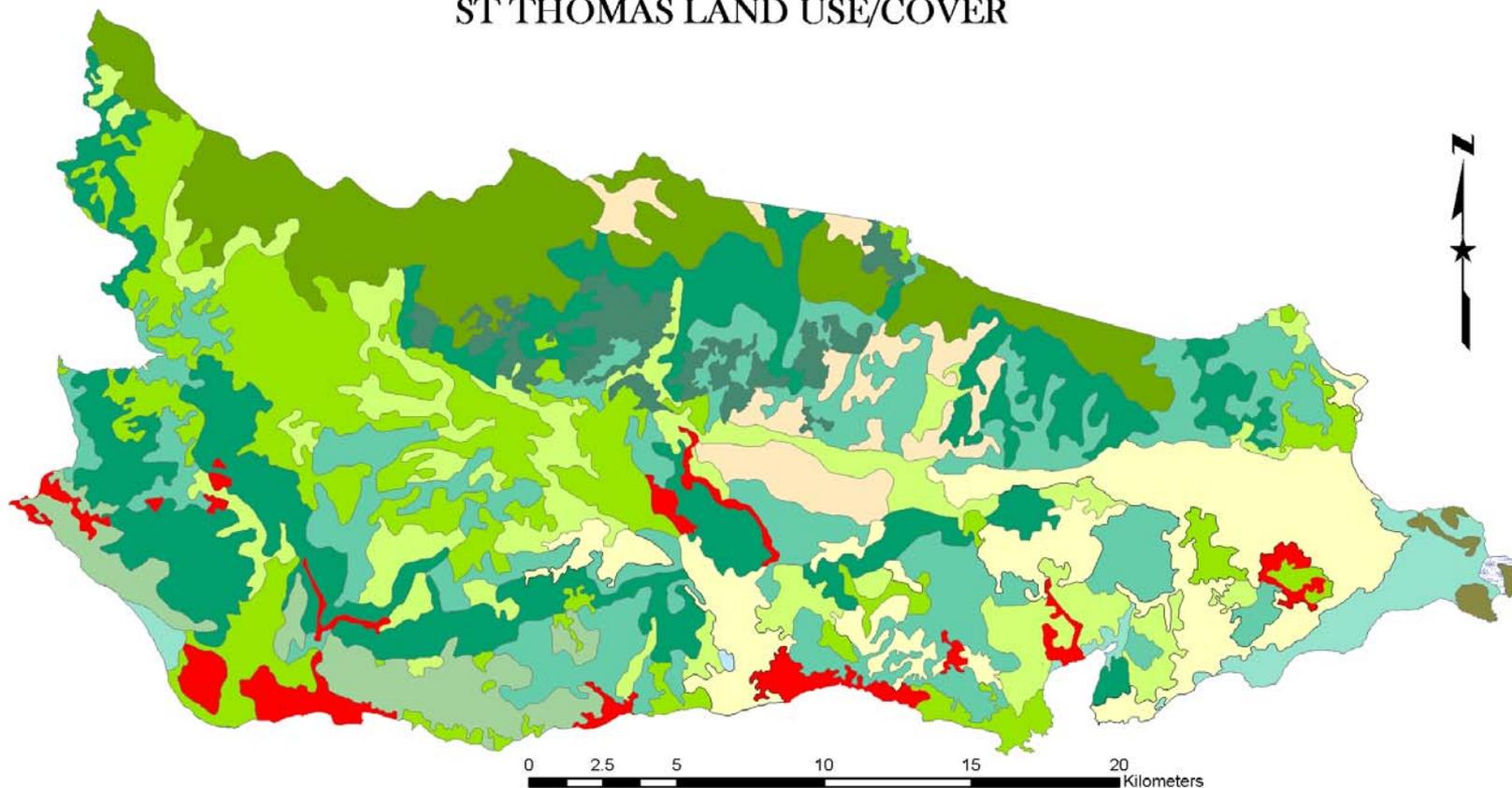
Customers will now have access to 1,500 strata and 45,000 deposited plans, over 680,000 valuation roll reports and scanned copies of the valuation enclosure plans for Kingston, St. Andrew and St. James. These services can be accessed through the agencies web site at www.nla.gov.jm.



The Forestry Department

has developed databases for the inventory and management of forestry reserves.

ST THOMAS LAND USE/COVER



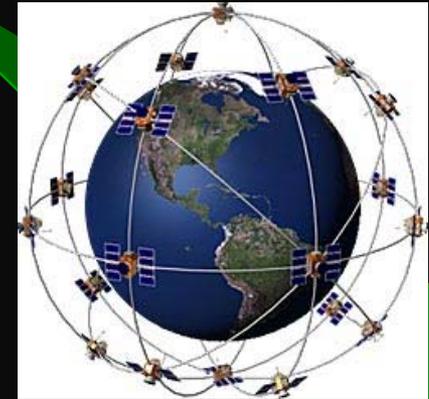
Legend

- | | | |
|---|--|---|
|  Buildings and Other Infrastructure |  Mangrove |  Disturbed Broadleaf |
|  Bamboo and Fields |  Plantations |  Swamp |
|  Fields and Disturbed Broadleaf Forest |  Closed Broadleaf |  Waterbodies |
|  Fields |  Fields or Disturbed Broadleaf Forest and Pine Plantation |  Tall Open Dry |
|  Herbaceous Wetland |  Disturbed Broadleaf Forest and Fields |  lake |
| | |  ocean |



Global Positioning Systems (GPS)

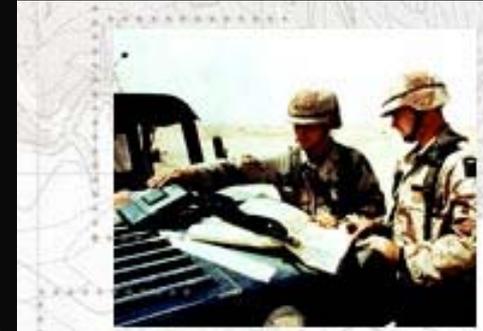
- GPS is a satellite-based navigation system
- The satellites broadcast to the earth timing signals that are converted into distance measurements/coordinates.





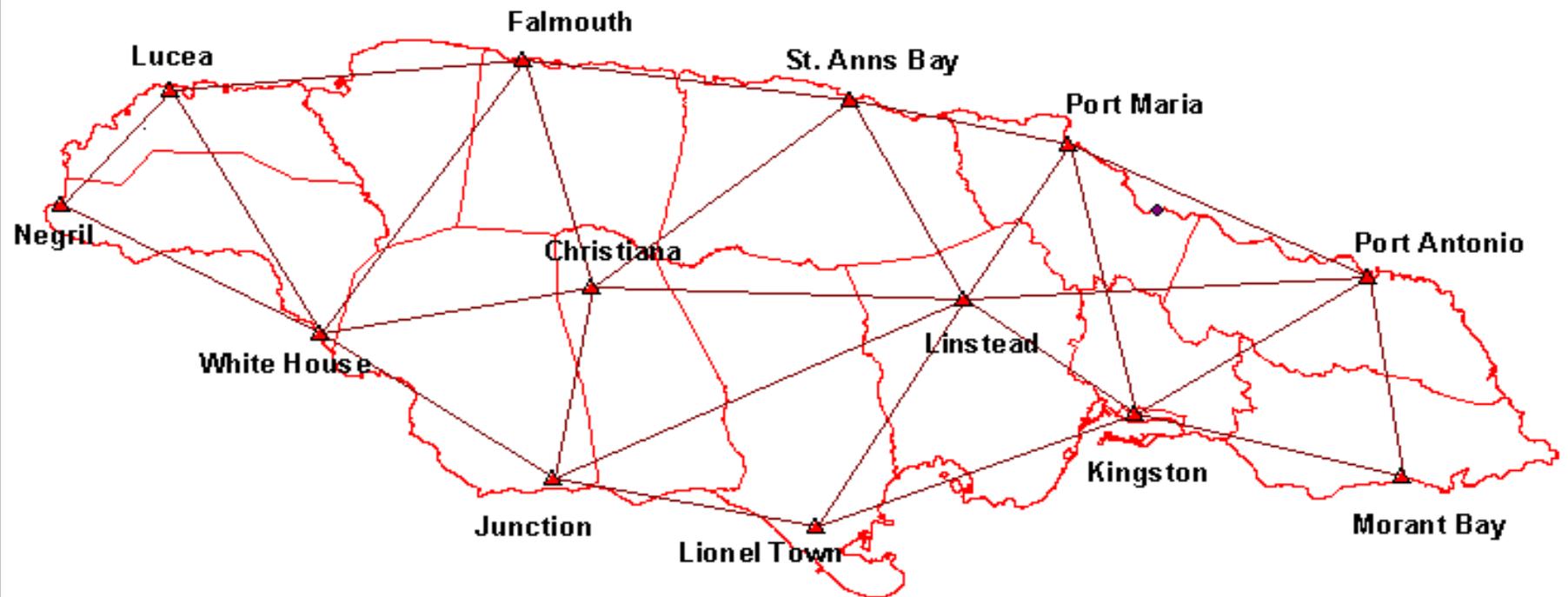
Possible Uses of GPS

- Machine control,
- Earth moving,
- Urban and municipal mapping,
- Environmental monitoring,
- Automatic vehicle location systems,
- Geographical Information Systems,
- Asset and Facilities management
- Navigation





Proposed VRS Network





Benefits of VRS Network

- Provides high precision GPS service
- Increased reliability and operating range
- Reduces cost and improve productivity of field crews
- Integrity monitoring
- All users in common coordinate frame



Land Administration & Management Project (LAMP)

- GoJ/IADB project to establish a dynamic land market that promotes the efficient use of the resource.
- Project has 4 components,
 - Land Registration
 - Public Land Management
 - Land Information Management
 - Land Use Planning and Development



Some LAMP Deliverables

- Regularization of 30,000 parcels in St. Catherine
- Preparation of Digital Cadastral Maps
- Operational Document Imaging System and the computerization of 270,000 titles and 5,000 deposited plans
- Digital inventory of public lands in St. Catherine
- Orthophoto and vector maps of Port Maria, Kingston & St. Andrew
- National GPS based geodetic network of the island
- Development of a participatory planning framework and manual
- Integrated Development Plans for Spanish Town and Santa Cruz.



Training Initiatives

- LICJ Geoinformatics Training Centre
- Joint UTECH/LICJ GIS Training Programmes
- MOU Spatial Innovision & LICJ/MLE – management & maintenance of hardware & software and use of lab
- Special training programmes & projects
- GIS Education in Schools Programmes





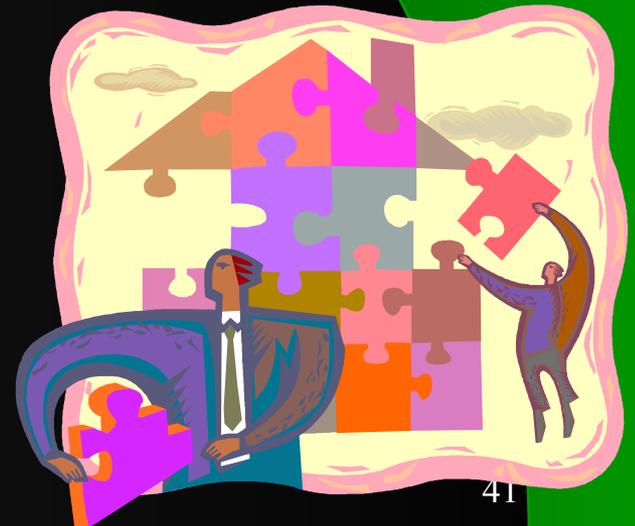
GIS Education in Schools

- US \$1million donation, in GIS software, and training material,
- Promote the use of GIS in teacher training experiences and methodologies
- on going Teacher Training Programme
- 250 students GIS literate in the first year.
- provide technical advise and mentoring



Lessons Learnt from Development of GIS

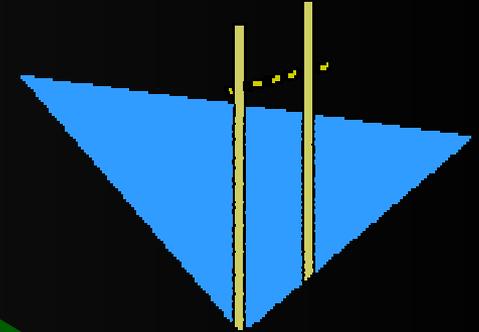
- **The Role and Importance of the Land Information of Jamaica**
- **Collaboration among stake holders**
- **Commitment and support from the CEO and management**
- **Training**



Challenges



Sustainability



- Project driven development vs. integration into business process
- Integration of GIS and related technologies into policy of organisations.
- The use of GIS as a tool for in-depth analysis and decision making



Challenges

The need for :

- more players in the geo-informatics industry
- methods and techniques for digital spatial data collection to maintain and sustain geo-spatial databases
- financial resources
- geo-spatial standards





Organisational & Institutional Matters

- Forge links with professionals & the private sector
- Rationalize government institutional structures to deal with GIS
- Adopt a corporate approach to data ownership and management
- Formulate policies for data access and use including copyright



Organisational & Institutional Matters (contd.)

- Formulate costing and pricing policy for public and private sector
 - full cost recovery
 - partial cost recovery
 - free
- Develop standards for data collection, storage and mapping
- Develop Meta-data directories



Human Resources

- Develop initiatives and innovative methods to utilize existing and additional GIS expertise
- Develop a coordinated approach to training in the Caribbean,
 - types of courses, short, on the job, certificate, degree
 - all levels of personnel
- Conduct awareness and briefing sessions for the Political Directorate, Permanent Secretaries and Heads of Government Agencies
- Rationalize and organize for the best use of GIS personnel



Mentoring/Training Programmes

- Develop mentor-training programme
- Develop and implement cross sectoral/agency training
- Ensure allocation of sufficient resources and attention for technical training
- Forge regional and international links with agencies, the private sector and training institutions
- Develop additional approaches, delivery systems, types and levels of GIS courses



Institutional/Partnership Arrangements

- Create a centralized technical unit, the National GIS Centre (NGIC)
- The GIS Technical Support Team
- Coordinate and technically support seven sectoral agency groups
- Develop Service Level agreements, contracts and MOU's among sectoral groups, agencies, private sector and the NGISC



People Requirements

- Leader
(Team Building/Facilitation)
- Good People, Self-Motivated
- Continuity
- Making a Difference
- Lots of Education/Training



Critical Success Factors

- Provision of training across all levels
- Leadership and enthusiasm from the top
- Management of people and change
- Proper Design of GIS systems
- Be user driven & focused
- Maintenance of systems created



THANK YOU

For additional information contact
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