

The Use of GIS by Surveyors and Engineers in Developing Nations for Building Infrastructure

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Overview

- Definitions
- Stakeholders
- Infrastructure Development Process
 - Existing Situation
 - State of Technology
- Infrastructure Operations
- Opportunities
 - SDI – Spatial Data Infrastructure

Definitions

Infrastructure –
Services and facilities that support day to day economic activity.

Infrastructure includes:

- | | |
|-----------------------|-------------------------|
| Roads | Pipelines |
| Electricity | Transportation networks |
| Water | Schools |
| Communication systems | Hospitals |
| | Others |

Stakeholders in Data

Geospatial Data

- SDI
- Land Ministry
- Survey
- Natural Resources
- Environmental Management
- Land Title
- Transportation
- Utilities
- NGO
- Infrastructure Managers
- Others

Stakeholders in Infrastructure

Infrastructure Data

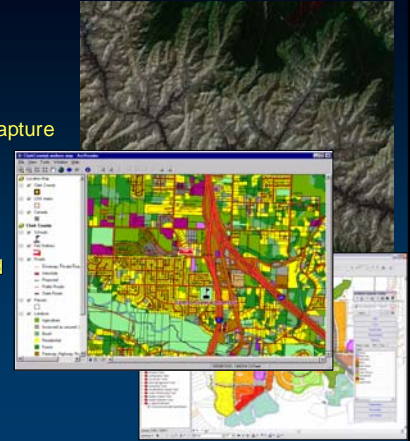
- SDI
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- Infrastructure Managers
- Others

Users of Geospatial Data for Infrastructure Development

Planners
 Surveyors
 Engineers
 Contractors
 Construction Managers
 Construction Surveyors
 Infrastructure Managers

Planning

Data Acquisition
 Data Management
 Large Scale Data Capture
 Photogrammetry
 Satellite Imagery
 Cadastral Data
 Land Use – Existing
 Land Use – Planned



Data Delivered
 on Paper Maps

GIS Users

Survey

Location
 Small Scale Photogrammetry
 Detailed Inventory
 Precise Information Acquisition
 Boundary/Cadastral Survey

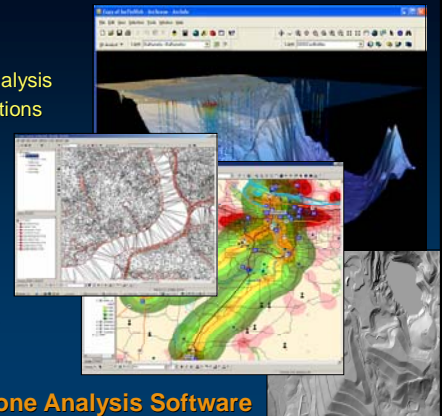


Text and CAD files

Field books, Data collectors, GPS, PCs

Analysis

Planning
 Engineering Analysis
 Ad hoc Calculations
 Cost Analysis
 Risk Analysis

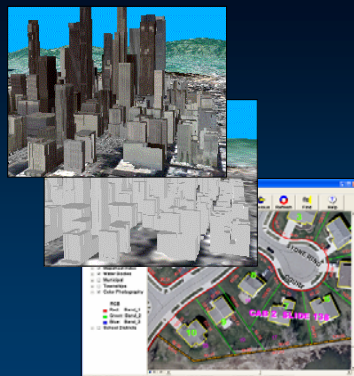


Text files, maps
 and CAD

PCs, Standalone Analysis Software

Design

Facility Design
 Drafting
 Risk Analysis
 Modeling
 Simulation
 Mitigation
 Layout
 Specifications
 Quantities
 Construction Drawings



Text files, maps
 and CAD files

PCs, add-on to CAD software

Construction

Specifications
 Drawings
 Financial Analysis
 Change Orders
 Revisions
 Quantities



Maps, text and CAD files

PCs, Lasers, GPS, Machine Control

Asbuilt Process

Drawings
Revisions
Quantities
Operations Data



Maps, text and CAD files

Lasers, GPS, Machine Control, Field books, Data collectors, GPS

Operations

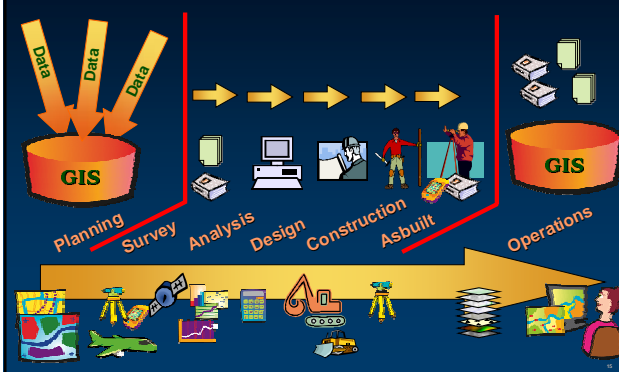
Outage Analysis
Traffic Management
Facility Management
Asset Management
Regulatory Reporting
Risk Analysis
Emergency Management
Customer Service
Document Management



Maps, text and CAD files
Connection to Other Systems

GIS Users

Infrastructure Development Process - Existing



Infrastructure Development Process - Revised



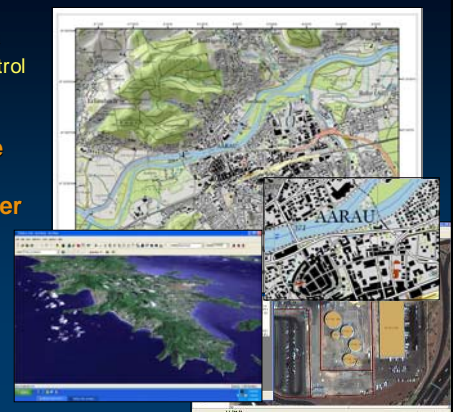
Benefits

Eliminate Redundant Data
Eliminate Cost of Data Conversions
Reduce Risk
Data Collected Contributes to SDI

SDI – Spatial Data Infrastructure

Planning Data
Geodetic Control
Cadastral

Collect Once
Use Many
Manage Better



Conclusions

Infrastructure Data Continuum
Minimize Errors
Improve Operations
Better Data – Better Operational Decisions
Less Training
Less Software
Single Repository
Lower Total Cost of Ownership
SDI

**Collect Once
Use Many
Manage Better**



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