Assessment of Need & Project Feasibility

**Principle success-factor issues**

- Development of a sound business case that focuses on financial issues that underlie both adequate project funding and prudent financial management of the project.
- Development of a strategic plan that addresses technical and organizational issues that insure the highest possible level of success.
- Development of GIS implementation specifications that meet both immediate and long-term objectives and optimize purchases in the rapidly changing marketplace.

Project Orientation

*(What is GIS and how will it benefit my department or organization?)*

**Products:**
- seminar booklet
- introduction to GIS
- seminars and discussions

Characterize Operations or “Business Functions”

- Describe use, preparation, and verification of maps and geographic data
- Identify problems and inefficiencies
- Determine relationship to programmatic mandates
- Identify information flows
- Assess personnel commitment and cost
Sample “Business Functions” for Local Government

- Maintain parcel maps and assessment roles
- Analyze re-zoning and zoning variance cases
- Review subdivision applications
- Conduct site plan review
- Emergency response

Sample “Business Functions” for Utility Organizations

- Conduct facility inventories/track assets
- Carry out routine maintenance
- Carry out long-range utility planning
- Dispatch and route field crews
- Design meter reading routes
- Perform load or flow analysis

User Needs Assessment
(What do the users do and need?)

Products:
- task descriptions
- system descriptions
- data descriptions
- observations
- GIS needs and potential
- legal & administrative issues

Interviews
Existing Data

Documentation

What is a Functional Requirements Study?

- Defines scope & structure of planned GIS
- Quantifies what data is needed & how it will be processed.
- Determines what Spatial Information Products (SIPs) will be produced.
- Building block for a Request for Proposal (RFP).
- Serves as basic reference guide during development and startup system.

How is a FRS Developed?

- Identify individuals responsible for making management decisions in current environment.
- Determine what decision they make.
- Identify new methods and technologies which might make decision making easier. All levels of personnel should be involved in this process.
  - Open communications = project support.
  - Looking at a plan from all angles ‘guarantees’ potential problems will not slip by.
- IMPORTANT: Technology must be ignored. The FRS is interested in the user needs.
- How often will SIPs be produced? (determine frequency)
- What data is needed to produce these SIPs?
- Determine which portions of process will require GIS.
Identify Information Products Needed to Support Decisions

Decision A Decision B Decision C Decision D Decision E Decision F
IP1 IP2 IP3 IP4 IP5 IP6 IP7 IP8 IP9 IP10 IP11

Identify Databases Needed to Create Information Products

Decision A Decision B Decision C Decision D Decision E Decision F
IP1 IP2 IP3 IP4 IP5 IP6 IP7 IP8 IP9 IP10 IP11

Can Be Used to Prioritize DB Development and ID Early Products

Decision A Decision B Decision C Decision D Decision E Decision F
IP1 IP2 IP3 IP4 IP5 IP6 IP7 IP8 IP9 IP10 IP11

Can also Identify those Information Products that are Hardest to Build

Decision A Decision B Decision C Decision D Decision E Decision F
IP1 IP2 IP3 IP4 IP5 IP6 IP7 IP8 IP9 IP10 IP11

FRS Methodology (1 of 3)

5% of total project cost can be justified by a highly committed organization

Fully Internalized: Most costly.
– FRS team from organization, trained by GIS consultant.
– FRS team coordinates definition of SIPSs done by organizational staff.
– FRS team, under guidance of GIS consultant, determine data and procedures needed.
– Advantage: FRS team understands company, limited knowledge of GIS/FRS procedures.
– Disadvantage: High level of organizational involvement = high cost.

Focus Group: Consultant leads organization through a series of group meetings.
– Discuss procedures.
– Prepare & edit descriptions of SIPS.
– Define data sets and system functions.
– Advantages:
  • uses knowledge of consultant, but work done mostly by organizational staff.
  • builds consensus on what is needed.
– Disadvantage: Organizational commitment is lower.

Interviews: Consultant gathers information through staff interviews & then prepares the FRS.
– Advantage: Minimal commitment of organization’s personnel.
– Disadvantage: No group involvement in FRS process.
FRS Methodology (3 of 3)

Questionnaire:
- Vendor creates customized questionnaire through organizational help.
- Questionnaire id distributed to appropriate personnel.
- Information compiled and vendor writes FRS.
- Advantages: low cost, limited information from a large user community
- Disadvantage: sketchy information, no opportunity for refinement.

Any combination of the above methods can be used.
- Use questionnaire to determine key people to interview
- Interviews can be done by FRS staff or focus group.

What is the value of a completed FRS?
- A concise definition of Spatial Information Products (SIPs)
  - frequency of product
  - input data definitions
  - steps necessary to produce SIPs
  - where appropriate, a set of product standards (legends, scales, etc.)
- A complete list of the data sets required
  - estimate data input workload
  - product priorities - is one SIP data input for another?
- What is required from the GIS? This must make sense to the non-GIS personnel.

Weakness of the FRS Process
- Invalid assumptions.
- Varying degrees of GIS awareness within organization.
- Funding - FRS assumes CONSTANT funding through system start up.

Changing Needs
- SIPs needed will change before the system is fully implemented.
- Mechanisms for review and update are necessary through system start up.

Importance of an FRS
- Planning, no matter how uncertain or reliable, is better than no planning at all.
  - A look at oneself is a healthy endeavor. Even for an organization.
  - Irregardless of the outcome, the FRS enhances organizational awareness.
- Management can conduct an initial financial feasibility study.
  - Project cost of current system assuming GIS is not implemented.
  - This weighed against cost of pilot study, system procurement, database creation and redundant operation during system startup.

SUMMARY
- A full FRS allows a company to take a look at its own internal structure.
- A FRS lets the organization know what its strengths and weaknesses are specific to GIS and data needs.
- Personnel needed for an FRS are decision makers and managers. An FRS is more interested in WHAT the decisions are rather than the data or procedures.
- The entire organization, from management on down, must be willing to commit the time needed to accomplish a thorough and effective FRS.
- Once started, anything which could stop the FRS from proceeding must be eliminated.
Four Main Problems

- The need to determine the value of a planning information system
- The design of the system itself - its overall structure
- The problem of the hardware and software.
- The spatial problem - the range of methods of data reduction and presentation.

Purpose of a Planning Database

- To constitute an inventory of the current state of investment in transport systems and urban and rural settlement.
- To monitor changes in the capacities and conditions of urban land, road and rail networks, utilities, hospitals, schools, and other communal infrastructure.
- To provide the capacity for modeling the relationships between the supply of the and the demand for new infrastructure in relation to settlement change.

Institutional Constraints

- Highly fragmented set of providers and users of settlement and infrastructure-type data. This fragmentation operates both sectorially and spatially.
- There is an extremely disparate potential set of data and data types, some already in digital format, others in digital format, others in paper map form.
- Problems of copyright and data ownership.
- Problems associated with access to and use of data.
- Issues of legal liability for data quality & what have been called 'culturally determined' attitudes of data.
- Temporal issues in populations and other official census data.
- Central government organization at present inhibits cross-functional data integration.
- Issues of scale of mapping and use of data - just trying to achieve geographical coverage.
- Software available for true modeling needed in the planning function.

Spatial Decision Support Systems

- Used to tackle ill or semi-structured problems. occurs when the problem, the decision-maker’s objectives, or both cannot be fully and coherently specified.
- Designed to be easy to use. user interface or front end, thus focusing the user’s skills on the problem at hand rather than mastering the software.
- Designed to enable the user to make full use of all the data & models that are available within their profession.

Spatial Decision Support Systems (Continued)

- User develops a solution procedure using the models as decision aids to generate a series of alternative scenarios on which decisions can be based.
- Designed for flexibility and ease of use and ease of adaptation to the evolving needs of the user.
- They are developed interactively & recursively to provide a ‘multiple-pass’ approach to problem-solving.
  - rather than the more traditional ‘serial’ approach.

Functional Requirements Study

- Identify Decisions
- Determine Information Products Needed
- Determine Frequencies
- Identify Data Sets Required
- Determine GIS Operations Required
### Components of a Completed Study

- **Definitions of Information Products**
  - Maps, reports, lists
  - For each product need:
    - Frequencies of production
    - Details of input data
    - Processing steps required to make the product
    - For maps - scales, legends, symbolization details
    - For list and reports - details of formats

- **List of Input Data Sets**
  - Details of data to estimate workload = cost
    - Volume - how many map sheets, records, attributes
    - Format - paper, digital files, survey documents
    - Sources
    - Frequency of update
  - List of data sets shared by/ between products
  - Product priorities