LOO 20 GIS-based Integrated Analysis for Improvement Project Implementation
20.1 What is important for integrating functional themes for GIS data analysis for project implementation?
20.2 What is the major difference between a traditional GIS analysis in project implementation and an integrated analysis for project implementation?
20.3 How do we get people involved in the use of geographic information?

20.1 What is important for integrating functional themes for GIS data analysis for project implementation?

The goal of an integrated LUTWR decision problem for an *implementation project* is to achieve minimal impacts to the surrounding community during the build out and long term maintenance of a project, for example, a wastewater facility such as Brightwater Regional Wastewater Plant.

In the context of the regional wastewater facility siting problem, because of the complexity of the problem, the process moved forward in four incremental phases as discussed in Chapter 11 Section 1, but the detailed GIS analysis for the site impacts comes in phase 4.

Phase 1 Prepare selection criteria and use to identify preliminary site list.
Phase 2 Study of the selected sites based on conceptual plant layout; six sites identified to move
        forward.
Phase 3 Prepare EIS to identify the impacts of the selected sites in phase 2, and suggest a preferred
        alternative.
Phase 4 Conduct permitting and further impact analysis as needed for construction.

The siting process integrates three concerns, marine outfall (water resources), conveyance corridor (transportation) and the physical site (land use). Combining them requires considerable human resources because integrated analysis is a complex undertaking. Phase 3 was an environmental impact analysis phase in which multiple themes were considered. However, considerable public contention arose during and after phase 3, as the people in the immediate vicinity of the chosen site did not feel that their voices were heard about negative impacts on community. Thus, **stakeholder input was not integrated early on, adequately, in the process.**

Let's consider the working definition of GIS used for this course: GIS is: *a combination of hardware, software, data, people, procedures, and institutional arrangements for collecting, storing, manipulating, analyzing, and displaying information about spatially distributed phenomena for the purpose of inventory, decision making and/or problem solving within operations, management, strategic contexts as related to urban-regional issues.*

The people part is as important as the task outcomes of GIS, as more and more people are involved. **The information use component of GIS is as important as the information development.**

20.2 What is the major difference between a traditional GIS analysis in project implementation and an integrated analysis for project implementation?

We can say that answer depends on the size of the project. With smaller projects fewer stakeholder perspectives are involved. With larger projects more stakeholder perspectives are involved. There is

considerable similarity between a GIS data analysis process for traditional project implementation process and an integrated one. However, there is a difference in regards to "who" comes to the table to scope, analyze and dialog about projects, and when they do so. A major difference between the traditional project implementation process and an integrated process is the degree to which multiple stakeholder views are integrated into the entire process, as in the case of the Brightwater Facility siting process whereby contention came late but strong.

The public involvement process occurred at the end of each phase, as per SEPA and NEPA regulations, rather than through the entire phase. *When stakeholder participation is left to the last subphase of each phase then considerable analytic work is performed without the benefit of those who would be impacted most directly, the "community publics" in the surrounding community.* At first glance it appears that performing work in that manner is more efficient. Indeed, but it is likely to be less effective. When called into question, the analysis might have to be done over, which means work flow process efficiency gains are not realized.

Integrated analysis incorporates public involvement throughout the process. With such involvement, the criteria are likely to change at the beginning of the process, incorporating a broader perspective on what it takes to be successful in the entire process.

Heathcote (1998), Dzurik (2003), and Randolph (2004) all emphasize enhanced stakeholder/public involvement. In particular, Randolph (2004) addresses land use change and transportation change as an environmental (i.e., water, air, noise, etc.) change, and thus multiple perspectives need be brought into consideration. This amounts to a "watershed perspective", or more generally a "shed" perspective, as also in commutershed and airshed, about flows of people+goods and resources, respectively.

In a democratic society, public decisions that are sustainable should reflect broad social values and changing policy should equally reflect changing values. Implicit in this is the simple notion of pluralism – decision making by many, not the few. At the watershed level, the concept is equally valid: **watershed planning, and for that matter, "any shed" planning, improvement programming and project implementation, as an activity for social change, should reflect the values of a community and not merely those elected.** In this sense, the watershed plan, program, and project implementation should be considered as a process of achieving sustainable community change.

In an integrated watershed resource management context, Heathecote (1998, p. 102) offers several ways to set goals as a way to address change. Four of them constitute a typology, developed as a cross-tabulated result based on **who participates** and **whether goals are explicit or not**.

Typology of Change Processes in Regards to Goals (adapted from Heathecote 1998, p. 102)

Goals explicit or not: Who participates:	Intentional goal setting	Emergent goal setting
Mutual goal setting	Planned change	Interactional change
Unilateral goal setting	Technocratic change	Change without goals

Change processes stem from what people know about the problem, as indicated in Problem Awareness. Heathcote describes involvement as increasing citizen power. Heathcote (1998), like Arnstein (1969), describes citizen participation in terms of a "ladder of participation" from informed stakeholder community to empowered stakeholder community.

20.3 How do we get people involved in the use of geographic information?

The ideal form of involvement is based on: 1) problem understanding, 2) community values, and 3) willingness of decision makers to delegate authority. A variety of factors are important in designing a public participation program. In essence, these factors relate to the concepts of democratic decision making, including sharing of information, building of trust and credibility, relationships between the public and the decision makers, and conformance with pre-existing requirements such as laws and funding availability. Some of the most critical factors in effective public participation are the following.

Before the process begins
1. Create a process that will engender mutual respect

2. Clearly state expectations about:
- Proposed project scope and key issues
- The nature and timing of public involvement
- Consultation and communication mechanisms
- The level of power citizens will have in the process
- Explicit proposals for selecting citizen representatives for the planning process

3. Include all interested stakeholder publics:
- Staff of public agencies at the federal, state/provincial, regional and local levels of government (as appropriate for the planning exercise)
- Elected officials at all levels of government
- Private corporations and other organizations with an economic interest in the plan
- Public interest groups (that is, groups formed to represent specific interests in the general public), including both high-profile leaders and the more general membership of those groups
- Other groups and individuals in the community, including private citizens, legal and medical professionals, and others with a general but not necessarily economic interest in the plan

4. Use public involvement techniques (including GIS based information) and processing for
- defining the purpose of involvement
- information dissemination
- receiving information
- two-way communication

5. Use small group discussion processes
- brainstorming
- Delphi processes
- breakout groups
- values clarification
- Circle processes
- role play – effective for teaching conflict resolution
- simulation – combine role play with random forces to create a realistic sequence of events.

These techniques provide a good way to build trust and team feeling. Support joint analysis of complex technical issues, and building of mutual understanding.

Other ways to enhance the public involvement process include aspects of plan administration, data collection and analysis, and communication in line with the following suggestions.

Plan Administration
- A single program manager and clear reporting relationships
- Program staff who are well-informed about the project and the community, who are skilled in public involvement techniques, and who are receptive to the ideas of community representatives
- Specialized expertise where necessary, for instance, in conflict resolution and facilitation
- Adequate funding to achieve stated program goals for public participation

Data Collection and Analysis
Joint collection and analysis of data on:
- Community values, systems and interested publics
- The proposed project and any likely impacts on community values and/or life-style
- The experiences of similar projects
- The costs of proposed measures and possible funding sources for those measures
- The environmental and economic impacts of proposed measures

Communication
- Clearly written documents and legible graphics
- Text written in semi-technical or lay language to be easily understood by all participants, and/or opportunities for technical education during the consultation period
- Full and unrestricted access to all data, documents, and others materials for all participants, whether electronic or in hardcopy form
- Well-structured advisory and consultation groups with:
    - a variety of skills represented (e.g., innovators, detail checkers, encouragers, moderators etc.)
    - a balance of activity between plan-related tasks and team-building activities. (The latter, although essential for long-term group function, should comprise no more than 40% of total activity or the group may be unproductive)
- Prompt, sensitive and respectful review of citizen submissions and thoughtful and timely responses from staff to public representatives. The goal is to create an ongoing dialogue whereby ideas and suggestions from a variety of sources are welcomed and thoughtfully considered.

Not all of the above are likely possible in every major project implementation undertaking, but these issues represent guidelines for what can improve the efficiency, effectiveness and equity of the long-term outcomes of the project. It is for this reason that analytic-deliberative decision support has become an important workflow to embrace, understand and use as a foundation for participatory GIS projects.