Geog 464 Learning Objective Outline

LOO 12 GIS Data Analysis in Planning Decision Situations

12.1 What constitutes a workflow task model for planning-level analysis?
12.2 How do planning-level analysis processes compare and contrast with one another?
12.3 What constitutes a workflow task model for water resources planning-level analysis?

12.1 What constitutes a workflow task model for planning-level analysis?
RUGIS Chapter 8 Section 8.1

Hopkins (2001 p. 187) presents a language framework composed of four dimensions for describing and using plans - behaviors, tasks, processes and standards. These four dimensions are part of the decision situation framework of chapter 3, but focus on the 4 major dimensions of plan making. Organizational mandates such as laws and regulations motivate the planning behaviors – the move to action of plan making.

Planning Behaviors – are fundamental actions (the activities) people take when making or using plans, e.g., talking to a constituent, involving participation of citizens, coloring a map, setting up date, etc.

Planning Tasks – combinations of planning behaviors that accomplish certain functional purposes, e.g., forecasting, evaluating two options (but remember a task has a purpose, process, and outcome) for accomplishing a goal or subgoal

Planning Processes – are sequences (patterns) of tasks as in a sequence of steps; planning processes yield plans

Standards of Rationality - provide criteria by which to judge planning processes; standards of rationality are different than a rational procedure.

Observed behaviors can be explained in terms of tasks and processes that would yield plans similar to what would be accomplished if ideal processes could be implemented directly, but processes are always conditioned by standards of rationality. More on that shortly.

For an example of workflow in plan making we consider the Steinitz (earlier called the nuanced workflow). Several widely recognized applications of the landscape (broader than just land use) planning process are provided at Carl Steinitz, retired professor of GIS and Landscape Architecture. The Steinitz modeling approach has now become associated with “GeoDesign”, an approach for (re)designing large areas of the earth. http://gisandscience.com/2011/05/05/carl-steinitz-a-framework-for-geodesign-2011-esri-uc-preconference-seminar/

The topic is being taken up because of its group-oriented and pro-active approach to making changes in the world. http://en.wikipedia.org/wiki/Geodesign
It is one of the more clear directions for using GIS in sustainability management.

12.2 How do planning-level analysis processes compare and contrast with one another?
RUGIS Chapter 8 Section 8.2.1 – 8.2.2

Plan making processes are commonly described by listing a sequence of tasks (task steps) – although the sequence might be iterative in many contexts.

Hopkins' (2001) describes planning processes as "patterns of tasks" yielding plans as the outcomes. As such, plan making processes are commonly described by listing a sequence of tasks – although the sequence might be iterative in many contexts.

Hopkins compares multiple process task sequences put forth by many authors. He describes how many of the descriptions are similar, and only some contradictory. For example, he cites: Wetmore – 3 tasks; Patton and Sawicki - 7 tasks ; Bryson – 9 tasks; Black, 8 tasks; Checkoway – 11 tasks

The processes are described at different levels of task resolution, some steps are more general that others, thus there are different numbers of tasks. He concludes there are two rationalities at work - procedural and communicative, whereby rationality is a way of describing "what makes (logical) sense" – although there are many rationales for why people do things.

Based on Hopkins 2001 Table 9-2 Comparing procedural and communicative rationality

Procedural (analytic) rationality	Communicative (deliberative) rationality
- All goals considered	- All interests represented
- All aspects of current and future situations assessed - All options considered - All impacts from alternatives tested - All options evaluated on all criteria	- Interests informed and able to converse about situation - Interests equally empowered - Good reasons, good argument - Allow all claims and assumptions to be questioned
Best alternative selected	Consensus reached

The comparison is not an either-or circumstance. Merging the two processes is appropriate to take advantage of aspects of both rationales.

- Procedural rationality is pursued for technical depth, as the process lays out a systematic and comprehensive set of steps so that an organization(s) considers circumstances that are commonly unknown. In communicative rationality, a mismatch of interests are articulated as the basis of the problem. Several GIS project activities undertaken by Carl Steinitz and his colleagues show that it is possible to undertake procedural and communicative rationality within the same planning process.

- In the context of environmental decision making, many have called this an analytic (procedural) and deliberative (communicative) process. Analysis is needed to develop deep insight about issues. Deliberation is needed to make sure broad-based aspects of issues are treated.

Turning to Transportation Planning…

Meyer and Miller (2001) outline four major stages of a decision-oriented transportation planning as an overview to National Cooperative Highway Research Program (NCHRP) 11 step process. They summarize the NCHRP 11 steps as the following four phases:

1. **Problem identification and/or definition** – This is a matter of clarifying perceived differences in current and desired states of affairs and interpretations of situations.
2. **Debate and choice** – Making sure a set of feasible alternatives is part of the decision mix, recognizing limited resources, the need to set priorities, the selection of one or more alternatives within a atmosphere of conflict due to differences in values, objectives, interests, and/or interpretations of data.
3. **Implementation** – Beyond the mere choice being made is the actual process of putting that choice to action as in implementation. Implementation of plans through programming of projects is the linkage between planning and programming that is now being recognized as a gap in the process of how to better coordinate change in transportation systems.
4. **Evaluation and feedback** – The last three US federal transportation laws (ISTEA, TEA-21, SAFETEA-LU : see end of outline) has made it clearer that understanding transportation system performance is a matter of monitoring appropriate characteristics through performance measurement. Providing appropriate feedback in the short, medium and long-term can provide perspective about how well the decision process is addressing the perceived needs in problem identification/definition.

Transportation Law Acronyms
1992-1998 - ISTEA – Intermodal Surface Transportation and Equity Act
1998 – 2004 - TEA-21 - Transportation Equity Act of 21st Century
2005 – 2010 - SAFETEA–LU - Federal Highway Administration. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

Now let's compare Meyer and Miller 4 phases, NCHRP 11 steps, and Steinitz 6 phases.

Meyer and Miller decision oriented framework associated with planning process	**NCHRP urban transportation planning process, adapted by Meyer and Miller (2001)**	**Steinitz landscape planning (modeling) framework**
problem identification / problem definition	"Vision" expressed in terms of a triangle with nodes labeled - prosperity - quality of life - environmental quality each is related to the other	Representation modeling
Problem identification / problem definition	Goals and objectives	Representation modeling
Evaluation and feedback	Performance measures	Representation modeling
Debate and choice	Data	Representation modeling
Debate and choice	Analytical methods	Process modeling Change modeling Impact modeling
Debate and choice	Alternative improvement strategies	Decision modeling
Debate and choice	Other sources for project ideas	Representation modeling
Debate and choice	Evaluation criteria	Scenario modeling
Implementation	Fiscal and resource prioritization	Decision modeling
Implementation	Implementation of strategies	
Evaluation and feedback	System operations	

Examine Workflow in Regional Transportation Planning Process.
- See RUGIS Figure 8.2 Regional Transportation Plan Making Process
- See RUGIS Figure 8.3 Steps in Transportation Plan Analysis
- See RUGIS Figure 8.4 Travel Demand Forecasting

How is GIS applied as depicted in the workflow diagrams?
- See RUGIS Figure 8.5 GIS Support for Transportation Analysis – travel demand forecasting

12.3 What constitutes a workflow task model for water resources planning-level analysis?
RUGIS Chapter 8 Section 8.2.3 – 8.4

Dzurik (2003) describes water resource planning in a comparable way to other types of planning.

He characterizes the planning process composed of nine steps:
1. Problem identification
    1.1 Identify needs and concerns with respect to the water resources of an area, whether local, regional, or national.
    1.2 Identify and clarify competing and conflicting interests involved,
    1.3 Involve public and begin/further coordination with agencies and groups
2. Data collection and analysis of existing data stores available
    2.1 Define study area, subwatershed, watershed, basin etc.
    2.2 Identify existing data pertinent to problem, e.g., geophysical, biological, social, demographic, and cultural characteristics, land uses, economic activity
3. Development of goals and objectives
    3.1 Specify relevant goals from organizations, public, groups involved
    3.2 Identify objectives associated with different goals
4. Clarification and diagnosis of the problem or issues – impairments to providing waters
5. Formulation of alternative solutions based on objectives and data previously articulated to establish criteria measures that can be used to formulate alternatives;
6. Analysis of alternatives - analyze the aggregate problem gap closure by each alternative solution (plan) – which ones address the problem the best in regards to concerns
7. Evaluation and recommendation of actions for alternative plans in terms of goals & objectives
8. Development of an implementation program (Capital Improvement Program) – (note: Dzurik sees this as part of planning process). Implementation goals and objectives should be compared to the original goals and objectives of the plan.
9. Surveillance and monitoring - Because many plans take so long to implement, that conditions change, and thus needs change and therefore the implementation is different than expected. In that case, the plan should be updated to reflect those needs.

How are land use, transportation, and water resource planning workflow steps similar and different in the three sections above?