Geog 464 Learning Objective Outline

LOO 02 Decision Support for LUTWR in PIPPI Decision Situations
02.1 What is the significance of decision situation topics land resource, transportation resources, and water resources management?
02.2 What is the significance of decision situations for planning, improvement programming, and project implementation?

02.1 What is the significance of decision situation topics land resource, transportation resources, and water resources management? *RUGIS* Chapter 1 Section 1.2

Land, Transportation, and Water Resource Management

Many people would agree that land, transportation, and water resources, and the relationships between and influences among them are fundamental issues in an urban and regional context. Each of those substantive topics when taken separately and when addressed together can benefit from an integration of GIS and decision analysis.

Land Resource Decision Issues

- Landscape/land cover – the "lay of the land" in regards to surface characteristics.
- Land parcel ownership – rights to a surveyed portion of land for carrying out various kinds of activities; this ownership can be public, private, quasi-public.
- Land zoning – the permissible uses for the portion of land according to certain regulations as defined by the governing body having jurisdiction over the land. Land is zoned for certain uses, while other uses are prohibited to reduce external effects.
- Land use – relationship between particular parcels and their interpretation of use, e.g. commercial, residential, industrial, or recreational uses all have particular externalities.
- How should we reduce land environmental hazards when use results in degraded landscape, prohibiting certain kinds of land uses to take place safely?

Transportation Resource Decision Issues

- What approaches should we use to address sustainable transportation development issues, all having geospatial implications? Some approaches include Vehicle / Fuel Technological Changes, Road / Vehicle Operations Improvements, Demand Management
- Mobility improvement within a transportation system often requires social and environmental disturbance mitigation. Impact analysis can be performed to compute the degree and nature of disturbances associated with various alternatives for transportation system improvements. Choosing among the alternatives is a matter of minimizing or maximizing the beneficial/detrimental impacts associated with those alternatives. Mitigation involves increasing the beneficial impacts while reducing the detrimental ones. What mitigation approaches are better than others in the context of a particular transportation system?

Water Resource Decision Issues

- Impacts on environment and people often involve a tradeoff among improving conditions. Farmers and salmon both need Columbia River water. Giving to one is taking from the other. How can we balance conflicting needs by considering the location and changes in water flow through dams?
- Access to fresh drinkable water continues to be a major global problem. Groundwater and surface water rights and resources are sometimes managed separately, but they have an influence on each other. How should we management them together as an integrated resource?
- How can we address water quality, and in particular water contamination, as a significant public health issue?

02.2 What is the significance of decision situations for planning, improvement programming, and project implementation?

The terms "planning, improvement programming, project implementation, management, and decision making" show up in work activity and books of all kinds. A sixth is considered "emergency situations". Unforeseen circumstances occur from time to time for which we might act in the current time (it is called mitigation) to be prepared for such emergency circumstances. How can we sort out the use of these terms so we can feel comfortable using them?

Our focus is on planning, improvement programming, and project implementation decision support situations, and particularly land, transportation, and water resources, due to their routine and pervasive nature. That does not mean we cannot understand the nature of emergency management decisions, as we will clarify a little later in its relationship to PIPPI.

Geospatial decision making in terms of spatial and temporal scale

Decision Making Scale	**Spatial and temporal scaling: number of sites and extent of situation over time**
Planning	Large, continuous spatial domain with single or multiple function, long-term temporality, consider all sites and situations in relation to each other in general; system-wide performance investigated, but no specific places
Improvement Programming	Multiple, discrete sites with single function, medium-term temporality; no relation to other sites analyzed; no system performance investigated
Project Implementation	Single, continuous domain with potential single or multiple functions; short-term temporality; immediate surrounding and external factors investigated in detail, locational performance in general

Planning creates plans. A plan is implemented over a long period of time. From time to time (e.g. every 5 years) plans are updated, as are the transportation plans for metropolitan planning organizations across the U. S. as mandated by federal law.

Capital improvement programs fund capital improvement projects across a six-year time period, composed of a two-year scope, two-year design, and two-year build phases. Budgeting

for water recycling capital improvement programs commonly occurs every two years to move projects along, and address several facilities at a time – the priority list. A program is commonly linked to a plan, e.g. transportation or water resource plan, whether it is broad-based comprehensive plan or single-purpose functional plan. Consequently, a program is the implementation of a plan.

Project implementation is initiated and completed to build out a plan as funded through a program. Projects differ in size from very large (mega) projects to rather small projects. A mega project is a redevelopment of an Interstate Highway Corridor for several miles or a large bridge or a regional wastewater facility. Those size projects could cost hundreds of millions of dollars. A small project would be realignment at a two-lane highway intersection for perhaps a few hundred thousand dollars, or the redevelopment of a park.

Emergency management can be considered the "compression" of all three plans, programs, project implementation within two different contexts: mitigation and response. In any case, our focus will be on each of the decision activities of planning, improvement programming, and project implementation, and how ***plans, programs and projects are linked*.** As such, there is a direct connection between community values and plans.

Consider this observation by Lewis Hopkins, from his book *Urban Development: The Logic of Making Plans* that speaks to underlining considerations in planning…

> "Plans are meaningless without intentions [**interventions**], and intentions are derived from **knowledge and values**. Intrinsic values set the basis for deriving instrumental values by determining what values will not be traded off with others. Instrumental values organize means by establishing how much something is worth as an input to achieving these intentions. These values are at least in part derived from individuals and are inherently subjective. Values might be assessed objectively, that is, assessed in such a way as to be replicable if assessed by some other observer of the subject. Values are better interpreted, however, as inter-subjective, which implies that both an individual's interests may be distorted and that socially shaped values may lead to desirable behaviors. Shaping attitudes about the consumption of land for urban uses may be more effective toward the survival of humans and other species than either regulations or incentives directed at behavior." (Hopkins 2001 p. 168)

If we are unclear about **assessment of conditions in relation to the values** referred to in the above quote, then we risk losing some values and/or mis-prioritizing other values.

How do partners (city representatives) within water resource inventory areas (WRIAs), that is, within Consortiums for WRIA 7, 8, and 9, view knowledge of values of Water Function (Water Flow combined with Water Quality) being assessed in lab assignment 1?

Assume you are a GIS Analyst for the Consortium; given the above, how do you approach your GIS work? From where would you derive knowledge of values? How about using GMA and Endangered Species Act guidance?