Geog 464 Learning Objective Outline

LOO 14 GIS Data Analysis in Improvement Programming Decision Support

14.1 What does establishing a priority among projects have to do with improvement programming?
14.2 How do improvement programming-level analysis processes compare and contrast?

14.1 What does establishing a priority among projects have to do with improvement programming?
RUGIS Chapter 10 Section 10.1

A capital improvement program commonly assumes that a plan, consisting of many more projects than possible, have been identified. Needs always seem to be greater than resources.
A capital improvement program process contains the following basic steps:

- Identify/establish a funding mechanism; one that will provide a stable stream of revenues.
- Prepare criteria to include funding constraints for projects.
- Enumerate alternatives based on relevant criteria
- Perform evaluation
- Make recommendations based on evaluation

New Jersey is completely covered by three Metropolitan Planning Organizations (MPOs):
Delaware Valley Regional Planning Commission
South Jersey Transportation Planning Organization
North Jersey Transportation Planning Authority Inc.

New Jersey STIP includes the three MPO Transportation Improvement Programs (TIPs) without modification. Aggregating the MPO TIPs is a matter of convenience to allocate federal funding. The US DOT allocates transportation funds to fifty states rather than the hundreds of MPOs spread across the states, leaving the states to pass the money on to the MPOs that conform to federal regulations.

The New Jersey STIP conforms to — and in many cases exceeds as their web site contends — the specific requirements of the federal regulations that include the following.

1. It lists the priority projects programmed for the first three years of the planning period.
2. It is fiscally constrained for the first three years. A detailed discussion is often provided within the TIP
3. It contains all regionally significant projects regardless of funding source.
4. It contains all projects programmed for federal funds.
5. It contains the state-funded projects.
6. It contains expanded descriptive information—considerably more than required by the federal regulations.

14.2 How do improvement programming-level analysis processes compare and contrast?
RUGIS Chapter 10 Section 10.2

A wide-variety of land use development programs exist. So many, that the differences are more plentiful than the similarities among organizations and jurisdictions. Much of this difference has to do with how people, organizations and jurisdictions use land, transportation and water.

Transportation improvement programming is one of the most visible, but at the same time invisible, decision situations in an urban context.

- It is visible in a sense that more people know about the process within organizations because of its impact on society.
- It is invisible because few people of the general public know how it occurs.

Everyone is affected by transportation change. Improvement programming occurs at many scales.

The project about Group-based GIS for Transportation Improvement Site Selection involved a needs analysis of three organizations in the central Puget Sound region – Duwamish Coalition, Puget Sound Regional Council, and King County DOT – to better understand how GIS could be used in transportation improvement programming. The basic decision problem involves ranking transportation projects, constrained by a limited budget such that many projects would not get into the program. A task model was created based on an early version of the decision situation assessment framework.
Table 10.1 presents a phase description as a generalization across case study tasks
Table 10.2 presents GIS decision aiding techniques associated with those task phases.

Capital Improvement Programming Decision Support – a story of technology platforms

1- Freight Mobility Improvement in the Duwamish Corridor
Software capabilities needed for each task of a freight mobility decision problem were enumerated making use of a system capabilities framework.

Subsequently, an application for freight mobility project decision modeling was conducted using a group-based decision support software called GeoChoicePerspectives. The case study is described in the textbook, and we will consider in more depth in the next session, but today let's consider the computer platform at this time.

The decision support application consisted of three modules, an extension of ArcView 3.3 called GeoVisual, a decision method module for computing ranks called Choice Explorer, and a vote composition module called ChoicePerspectives. The software is a customized workstation platform, and still runs great, but on a "dated" platform ArcView 3.X. The software was not converted to ArcView 8.X (newer) technology platform due to higher priorities for other opportunities.

2 - Regional Transportation Improvement in central Puget Sound region
In 2005 that task model and the prototype implementation, lead to a specification of the system requirements for online participatory GIS for transportation decision making, articulated in terms of a sequence of decision process tasks to support regional transportation decision making. That platform is available at www.letsimprovetransportation.org with login as "guest", password is "guest".

Although GIS software platforms exist in many forms these days, e.g., commercial-off-the-shelf production implementation (e.g. ArcGIS for Desktop) or Internet-centric (e.g. ArcGIS Pro and ArcGIS Online), there is a significant need for customizing systems to meet the needs of users.

A task-based problem solving perspective is an important key to successful customization. Stakeholders have many insights about their task requirements, and these are helpful for specifying the character of the analysis and deliberation to be performed.

Task Analysis is a method that can be used to uncover workflow breakdown, which can then be used to identify the geospatial information capabilities for implementing decision support processes. The Decision Situation Assessment method presented in Chapter 4 was developed for such purposes.