The Idea:
Transportation projects usually require a combination of information originate from diverse sources such as ground surveying, hydrological, geological and census data, especially during the early planning phase. However, given the variety of data sources, the growth of geo-technology and the environmental requirements, it imperative that data be used in the proper way so that analysis is correct and accurate.

Data mining is vital for the proper attainment of geo-information for EIA studies. This study addresses a multi-scale geodata structuring which is a result of Streamlining Environmental and Planning project, under development on the proposed I-269 bypassing Memphis-TN. The study area covers Desoto and Marshall County in Mississippi and Shelby and Fayette county in Tennessee.

Hypothesis:
Earlier integration of local data is ideal. Local plans and issues may be reflected in results and possible opposition may be avoided.

Challenge:
Integrating “best available data” from Federal, State and local “spheres” is the biggest challenge. Organizing the data and developing a “multi-scale” data dictionary is a must!

Federal data → Moderate to low detail data. Very well documented, distributed nationally, widely used.

State data → Moderate to highly detailed. Widely used with decent metadata. Reuse of value-added versions of federal data is common.

Local data → Highly detailed data. Produced for internal use as needed. Not typically distributed so normally does not incorporate proper metadata documentation.

The Process:
Gathering and understanding available geodata is not simple. The process is lengthy, requires communication, early data exchanges, and people skilled at sorting out complex data.

With the SEPP, the geodata useful for transportation corridor planning is being cataloged and organized according to source, category, and applicability.

The data are organized according to different categories and applicability. The result is a GIS data structure that allows the selection of least-cost corridors based on low-to-medium scale level. For the large scale level, high resolution data and zoning information from local sources are added into the model to compute the least-cost alignments.

Results:
Structuring the multi-scale geodata resulted in a complete inventory of all essential information available for use on the EIA in transportation planning. It is a great help to deal with the best-available data for composing complex maps, identifying and filling the gaps which occurred in traditional EIA studies. Data dictionary structure provides support for transportation practitioners that can easily assess the information and availability of the data and rapidly bring these information into maps for a certain locality varying scale and time.

Multi-scale Digital Terrain Model:
Federal data (NED 30m) → Federal data (NED 10m) → Local data (LiDAR 1m)

Multi-temporal image analysis:

“It’s a continuous process!”

The integration of best available data has been successfully supported the NCRST team on move forward the SEPP project. The planning process requires a large amount of data and variables that depends on structure of the geodata. A good example is the integration of bio-physical, socio-economic and cultural information to select least-environmental impact corridors.

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