

## 4.1.2

### **Developing a Desktop GIS Application to Manage, Control, and Execute a Transportation and Economic Analysis Model**

#### **Presenter**

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A Highway Economic Analysis Tool (HEAT) was developed for Montana Department of Transportation (MDT) on the ArcGIS platform. The purpose of the model is to forecast the economic impact of potential highway improvements. The HEAT model will be utilized by MDT as one component of the agency's project planning process. The model analyzes the relative impacts and benefits of highway projects through the following analytical components:

- Travel Demand Network Assignment,
- Accessibility Measurement (measures the relative accessibility of labor markets, and employment centers),
- User Benefits Analysis (measures changes in social and environmental attributes that can be attributed to a potential highway improvement), and
- Economic development impact analysis.

These sub-modules were implemented using VBA and are programmed to run from a customized ArcGIS interface. A GIS system was chosen as the common platform from which to integrate the modules and run the entire model stream for many reasons. First, the model requires a lot of data inputs from many sources which can be optimally managed in a GIS system. In addition, many of the model components have information rich results which have geographic distributions and are best viewed via a map-based interface. A final consideration in the selection of ArcGIS as the platform on which to develop the tool, is its support of Visual Basic and other universal programming environments which has made it flexible and extendable.

The presentation will introduce the model components, describe the supporting databases, and will focus on the GIS development aspects of the model implementation. The challenges and successes encountered in the development process will be highlighted. Some of the application's functionality will be demonstrated during the presentation.