

## Executive Summary

The Bridges Decision Support Model is a geographic information system (GIS) that assembles existing data on archaeological sites, surveys, and their geologic contexts to assess the risk of bridge replacement projects encountering 13,000- to 150-year-old Native American sites. This project identifies critical variables for assessing prehistoric sites potential, examines the quality of available data about the variables, and applies the data to creating a decision support framework for use by the Iowa Department of Transportation (Iowa DOT) and others. An analysis of previous archaeological surveys indicates that subsurface testing to discover buried sites became increasingly common after 1980, but did not become routine until after the adoption of guidelines recommending such testing, in 1993. Even then, the average depth of testing has been relatively shallow. Alluvial deposits of sufficient age, deposited in depositional environments conducive to human habitation, are considerably thicker than archaeologists have routinely tested.

By contrast, borings taken in advance of bridge construction to assess the engineering properties of soils penetrate much deeper. Comparison of soil/sediment descriptions logged by archaeologists and IDOT bore hole logs indicates that geotechnical borings provides stratigraphic data that is adequate for prehistoric archaeological risk assessment. Data from soil/sediment logs indicate that sedimentary contexts suitable for prehistoric occupation average 2-3 m in thickness in Iowa valleys, and are underlain by coarse-textured channel and bar deposits unlikely to contain prehistoric sites. In proximity to streams, and particularly along the larger streams and rivers, alluvium deposited in the last 150 years often buries prehistoric surfaces to depths of up to 3 m. This poses difficulties in “reading” the ancient landscape and finding buried sites. Especially along the larger rivers, 19<sup>th</sup> and 20<sup>th</sup> century channel activity and anthropogenic disturbances may erode away the pre-A.D. 1850 deposits.

With these observations in mind, the Bridges Decision Support Model is a web-based process that links users to interactive databases and maps that provide information from stratigraphic logs, historic maps, previous archaeological survey coverage, and GIS site location models. The model steps the user through a sequence of steps that assesses the risk that prehistoric sites will be present within the area affected by a particular bridge replacement at a particular location in an Iowa stream valley.

The model allows the user to collect these data for submission to the Iowa DOT for a final risk assessment. In addition to risk assessment, the model can be used for archaeological survey planning as well as long-term prescreening of bridge replacement projects. Our recommendation is that the Iowa DOT test the model by using it to assess archaeological survey needs for structures identified in its five year plan for bridge replacements. The project would also result in the compilation of additional bore log and archaeological data for improving and refining the model.