

Rahall Transportation Institute Research Project Description Form

Project Number: RTI TRP 00-04

Project Title: Expected Flood Damages to Transportation Infrastructures as a Proportion of Total Event Costs: a Methodological Exploration

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Project Objective: To improve the estimation of flood related transportation infrastructure damages in the Tennessee Valley as a proportion of total event costs.

Abstract: The Tennessee Valley Authority (TVA) operates a variety of facilities throughout the whole of the Tennessee River watershed through which it affects the flows of both navigable and non-navigable waterways. These flows are influenced in support of a number of activities including, commercial navigation, flood risk mitigation, hydroelectric generation, municipal water supply, recreation, and water quality control.

Within the realm of flood risk mitigation, the TVA routinely must model the effects of water release practices on the likelihood and magnitude of possible flooding in specific geographic areas. Projected flows are translated into pool elevations that must then be used to estimate expected flood damages. Within this process, the TVA has carefully documented the likely damages to residential and commercial properties, as well as their contents. However, damages to

transportation infrastructures have traditionally been captured through the application of a scalar value that is, in fact, intended to reflect a number of ancillary flood damages.

Experience, however, suggests that the proportion of total event damages attributable to transportation infrastructure destruction may vary significantly based on the characteristics of individual floods. Specifically, floods that involve significant flows damage both transportation infrastructures and other structures. However, in the absence of such flows transportation structures are far less likely to be effected even when residential and commercial facilities sustain considerable damage.

Within this context and with the overall aim of improving a priori flood damage assessment, the Rahall Transportation Institute (RTI) and the TVA propose a joint study effort designed to improve the estimation of transportation infrastructure damages as a proportion of total event costs.

Task Descriptions: The investigation of the relative share of total event damages attributable to transportation infrastructure and equipment losses will have three specific steps. These include (1) the estimation of damage models based on existing data from the upper Mississippi basin, (2) a survey effort necessary to the effective treatment of changing flood risks, and (3) the simulation of comprehensive economic impacts.

Milestones, Dates, Schedule: Project shall begin January 1, 2003 and be completed August 31, 2003.

Yearly and Total Budget: Both are \$94,340

Student Involvement: None anticipated.

Relationship to Other Research Projects: None

Technology Transfer Activities: Report will be distributed and posted on the RTI website.

Potential Benefits of this Project: The overall aim of this project is to improve a priori flood damage assessment by enhancing the ability to estimate transportation infrastructure damages as a proportion of total event costs.

TRB Keywords: Damage; Flood; Flooding; Infrastructure; Methodology; Transportation.