ZETA-TECH Associates updated the Railway Tie Association’s (RTA) SelecTie crosstie economic analysis model.

The SelecTie model incorporates all of the key input and influence factors, including costs (materials, labor and equipment), maintenance activities, and engineering equations for component life prediction. The SelecTie model has been used as a decision-making tool by railroads, transits and consultants.

The SelecTie model provides an economic benefit analysis of alternate crosstie configurations. While the focus is on wood vs. concrete ties, the model can be used for alternate materials. The model features user selection of maintenance activities and cost categories and has the capability for detailed cost inputs at the individual gang and equipment level. The model uses a Present Value Life Cycle Cost analysis, and the results are shown as net benefit and return on investment (ROI).

The model incorporates default values for all of the inputs so as to allow for easy use and also to provide a baseline number when the model is used. These default values were last updated in 1996 and required updating.

In order to ensure accurate input values, this update was performed with a major U.S. Class I railroad. These revised default values addressed the range of different track maintenance activities and include:

- Equipment, Labor and Material Costs
- Labor Gang Composition
- Productivity Rates for Different Activities
- Material Requirements

Figure 1 shows the material requirement updates that included the number of wood ties replaced each replacement cycle, ballast type, probability of derailment and derailment characteristics.

Figure 2 shows the unit cost for different materials, including

- Wood and Concrete Ties

All current SelecTie licensees are eligible for the 2006 default value upgrade based on member status. Contact RTA offices at (770) 460-5553 or via email at ties@rta.org for more information.
Figure 3 shows the equipment unit costs, which were increased to reflect current costs in the industry. The model also includes the number of units in a gang, required for both tie types updated for different maintenance activities.

Figure 4 shows the updated daily wages for each labor group that were increased to reflect current labor costs. The model also includes the number of persons in each labor group by maintenance activities (e.g., rail replacement, rail transposing, tie installation, surfacing, undercutting and gaging).

Figure 5 shows the productivity rates that were updated for the key maintenance activities to include rail replacement, rail transposition, tie installation (ties/day), rail grinding, concrete tie repair, gaging (wood ties), and undercutting (maintenance and conversion).

The updated SelecTie model retains all of the flexibility and accuracy of the original model and will allow SelecTie to continue to be an effective tool for analyzing wood, concrete, and alternate tie material costs and benefits. Figure 6 and Table 1 show one sample case result incorporating most of the major maintenance functions included in the model. §