2. DOT RAIL-HIGHWAY CROSSING RESOURCE ALLOCATION PROCEDURE - OVERVIEW

There are currently approximately 197,000 public at-grade rail-highway crossings in the United States. At an average cost of over $55,000 per installation, there are insufficient funds available to install automatic warning systems at each of these crossings. The DOT Procedure was designed to assist in determining how limited safety improvement funds should be allocated to specific crossings and warning device improvements to achieve the greatest reduction in accidents and casualties.

Figure 2-1 illustrates the basic functions of the DOT Procedure. Inventory information and the accident histories of the individual crossings being considered are used by the DOT accident prediction formula to provide a list of crossings ranked by the estimated number of accidents or casualties that will occur at each crossing. State crossing programs commonly use such rankings, produced by various formulas, as a basis for determining safety improvements; i.e., crossings are improved in the order of their predicted accident levels, with the crossing having the highest accident rate treated first, and so forth. However, if the program objective is to achieve maximum accident reduction for a given total cost, this procedure must be extended to consider the different warning device options which are available for each crossing and their differing costs and effectiveness for reducing accidents. For example, installing a flashing light at the crossing with the tenth highest accident rate might yield a higher accident reduction/cost ratio than installing an automatic gate at the most hazardous crossing. Consequently, the resource allocation model uses the predicted accidents or casualties at each crossing together with information on the safety effectiveness and costs of alternative warning device improvements and the funding level available to determine the most cost-effective set of improvement decisions; i.e., decisions on which crossings to improve and the types of warning devices to install at those crossings to result in the greatest accident or casualty reduction given the available funding.

The DOT Procedure does not dictate final decisions for crossing improvements, but does recommend programs to aid in making informed decisions. As an analytical procedure, its recommendations are dependent on accurate input data and assumptions. Errors in the Inventory and inaccuracies in assumptions regarding warning device cost and effectiveness are normal and may cause inappropriate recommendations. To ensure

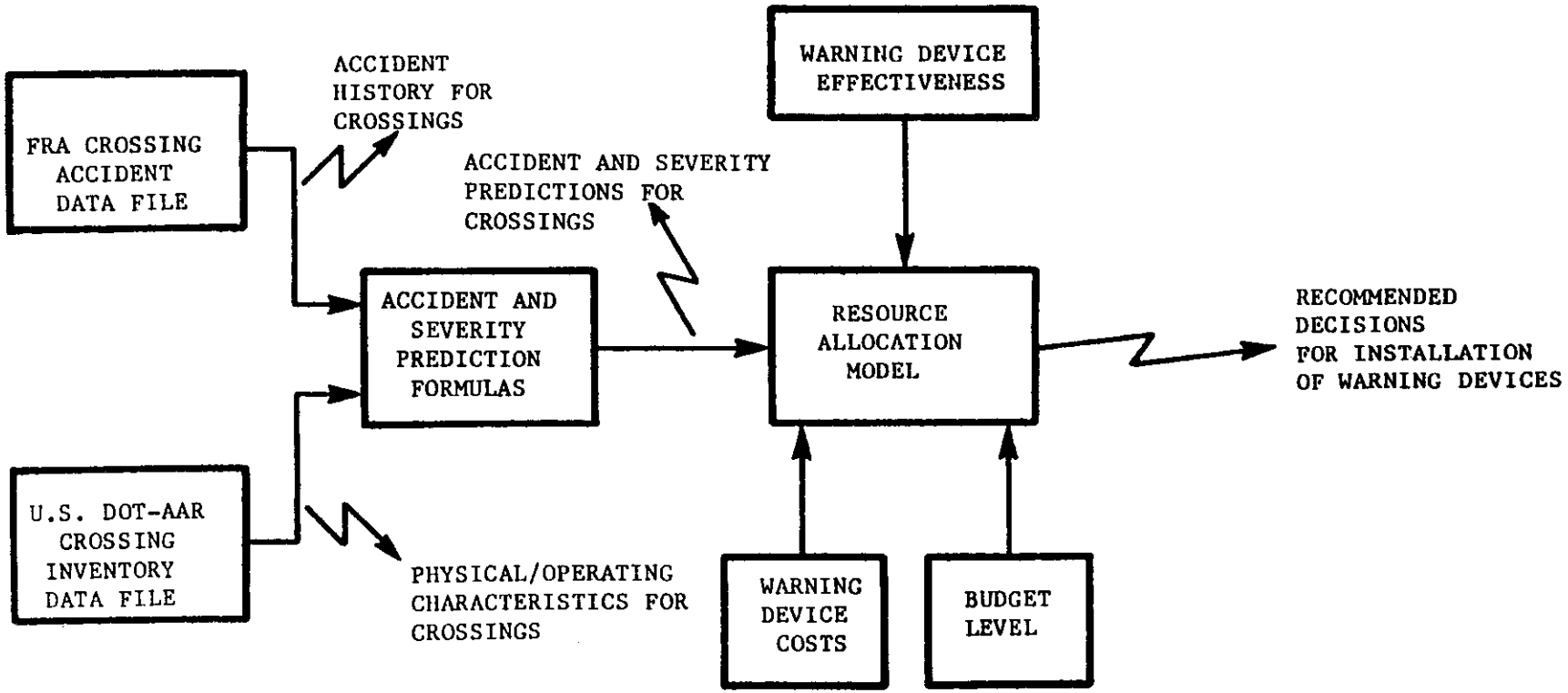

FIGURE 2-1. DOT RAIL-HIGHWAY CROSSING RESOURCE ALLOCATION PROCEDURE

accuracy of the input data, they should be validated by a diagnostic team as part of their normal duties in making field evaluations of recommended improvements. While in the field, the diagnostic team should also make note of other considerations that may impact final improvement decisions but are not included in the DOT Procedure. These considerations should include highway congestion, school bus and hazardous materials traffic, restricted sight distance, visual clutter, and other unusually hazardous, costly or mitigating characteristics of individual crossings. A procedure for performing this evaluation is described in Section 4.2.6. Results of the DOT Procedure, findings of the diagnostic team, inclusion of any state warrants, and the judgement of state and local officials should all be considered before final improvement decisions are made.

The primary role of the DOT Procedure is to assist states and railroads in developing crossing safety improvement programs. The first stage in developing these programs is usually to prepare a list of candidate crossings for safety improvements. To assist in preparing this list, the DOT accident prediction formula can be used to rank crossings by predicted accidents or casualties to identify hazardous crossings potentially needing safety improvements. The resource allocation model can then be used to evaluate alternative programs for improving these crossings. For example, the impacts on program benefits of changes in key program parameters such as budget limits, warning device installation strategies (e.g. flashing lights only, gates only) and warning device cost and effectiveness assumptions can be determined. Analysis of these results could help in deciding upon budget levels for crossing improvements and in determining the effectiveness of implementing state warrants specifying installation strategies. Once key program parameters have been decided upon, the DOT Procedure will provide an initial recommended program, based on cost-effectiveness considerations, for review by the state. The DOT Procedure is also useful for railroads in providing recommended uniform improvement programs over their entire rail system that passes through several states.

Initial results of the DOT Procedure provide useful guidance to diagnostic teams by specifying crossings with recommended improvements that should be field inspected and data that must be checked for accuracy. Using the field verification procedure described in Section 4.2.6, diagnostic teams can determine revised cost-effective improvement decisions for particular crossings where original data were found incorrect. The revised results obtained by the diagnostic team then form a useful basis upon which state and local officials can finalize crossing improvement programs.