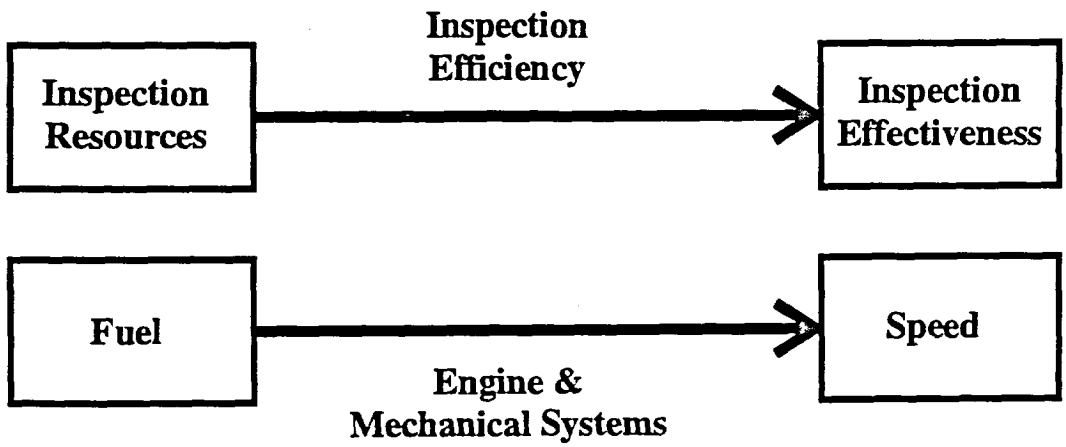
equipment, etc. Note that inspection resources can be increased in the short term, reallocated, etc. The level of inspection resources allocated to a particular task will be called the *inspection effort* for that task.

The conversion of inspection resources to inspection effectiveness is represented by a quantity called *inspection efficiency* in Figure 1c. The rate of conversion, which reflects procedures, equipment, personnel, etc. is generally not constant. Sometimes (see below, Section 3.3) doubling inspection resources may more than double inspection effectiveness; when this happens, efficiency increases with resources. But most often, increases in inspection resources result in less than proportionate increases in inspection effectiveness; in other words, inspection efficiency usually decreases when resources increase. In general, these "diminishing marginal returns" to inspection resources reflect that, after detection has become fairly certain (or as its likelihood approaches some inevitable ceiling), additional inspection resources must result in smaller and smaller increases in inspection effectiveness. A more formal representation of inspection efficiency is given in the Appendix.

With reference to Figure 1c, a natural analogy to the inspection resources-efficiency-effectiveness relationship can be found in the speed of a vehicle, as shown below.



Just as doubling the fuel consumption does not (usually) double the speed, so doubling the inspection resources does not usually double the inspection effectiveness.

3. Findings

In the Appendix some formal models are developed and analysed, using appropriate tools from Decision Theory and Game Theory. The models were developed to emphasize three