

# Interactive Highway Safety Design Model

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“Safer Roads through better design”. IHSDM will be a computer-aided design (CAD) compatible, safety analysis software tool, applicable for new highway construction and reconstruction. It will provide a systematic approach for highway planners, designers, and reviewers to assess the safety impacts of specific highway design decisions from the planning through final design stages.

IHSDM is under development by ITT Industries, Inc., Systems Division, under the direction of the Federal Highway Administration. Currently it is a stand-alone system and can be used to analyze two-lane highways. The current beta version consisting of two modules: Policy Review Module and the Design Consistency Module have been released in the United States and Canada for testing. iTRANS Consulting Inc. is the Canadian IHSDM testing site.

iTRANS Consulting Inc. is currently testing IHSDM by applying existing project data from a reconstruction project they are currently working on. IHSDM's results were very much similar to that of road designers at iTRANS. IHSDM found deficiencies in sight distance and design speed. IHSDM pinpoints areas where deficiencies exist and provides reports and charts summarizing these deficiencies.

## **Policy Review Module (PRM)**

The Policy Review Module is used to insure that proposed and existing highway designs comply with established criteria, such as *AASHTO's "A Policy on Geometric Design of Highways and Streets"*. Currently there are no Canadian standards, but future versions will allow for input of different policies. The PRM identifies design elements that do not meet minimum standards such as stopping sight distance, passing sight distance, cross slope, road grades, etc. and provides them to the user in a well documented report.

## **Design Consistency Module (DCM)**

The premise of DCM is that drivers generally make fewer errors if they are faced with conforming horizontal and vertical conditions rather than those that violate their expectations. DCM's graphic displays are for Desired Speed, Grade Limited Speed, V85 Speed and the Speed Profile.

DCM evaluates the operating-speed consistency of two-lane rural highways. The evaluation is performed using a speed-profile model that estimates 85<sup>th</sup> percentile speed on each element along an alignment. The module generates two consistency-rating measures:

1. The difference between estimated 85<sup>th</sup> percentile speeds and the design speed of the roadway, and
2. The reduction in 85<sup>th</sup> percentile speed between each approach tangent-curve pair.

### **The Future Of IHSDM**

There are 4 other modules planned for testing by ITT Industries and the FHWA, they are:

- Crash Prediction Module
- Driver/Vehicle Module
- Intersection Diagnostic Review Module
- Traffic Analysis Module

IHSDM looks promising as a tool to help designers in designing safer roads. It will also provide efficiency in the analysis stage by automating the process, as designers well know how tedious these steps can be.