U.S. Department
of Transportation

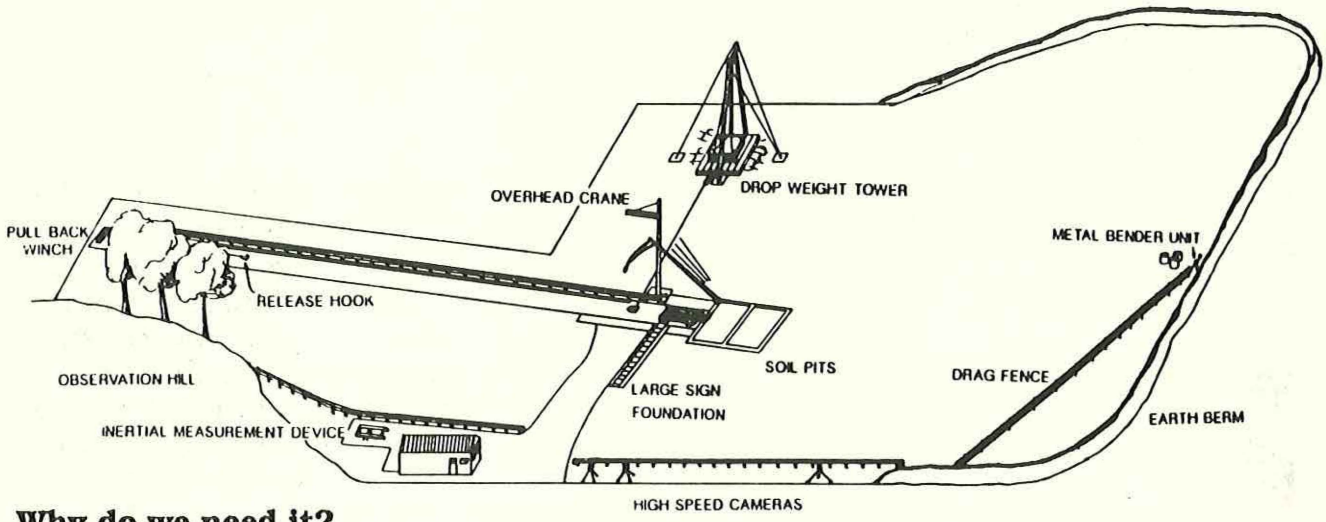
**Federal Highway
Administration**

Research, Development,
and Technology

Turner-Fairbank Highway
Research Center
6300 Georgetown Pike
McLean, Virginia 22101-2296

FEDERAL OUTDOOR IMPACT LABORATORY (FOIL)

What is the FOIL?
A research and learning center for highway engineers, scientists, and others working on roadside safety hardware.



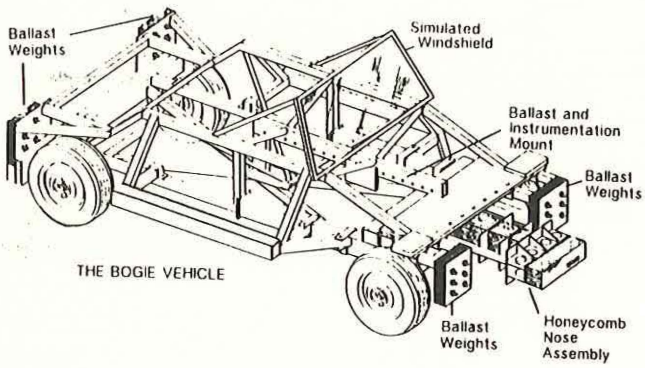
Why do we need it?
The interaction between driver, vehicle, and roadside safety hardware is very complex. An understanding of this interaction is the first step leading to safer roadside safety hardware.

What has been accomplished so far?
- Completed the facility for controlled testing of roadside safety hardware.
- Developed a new test vehicle for testing breakaway luminaires that replicates a small car of the 80's (1800 lbs), and is reusable, economical, and provides highly repeatable results.
- Determined that a widely used pendulum did not accurately replicate the intended small car of the 70's (2250 lbs).
- Identified a number of test variables that significantly affect the safety performance of breakaway luminaires.
- Developed a semi-automatic microcomputer-based procedure for rapidly analyzing film of crash tests.
- Initiated a program to understand what happens when roadside hardware is side impacted by vehicles.
- Developed an awareness within FHWA that improvements in our understanding of the crash environment are necessary to provide a higher level of roadway safety.

(FHWA-RD-88-182)

(Issued June 1988)

INTRODUCTION - The Federal Outdoor Impact Laboratory (FOIL) is a research facility designed specifically to study the interaction between driver, vehicle, and roadside safety hardware. Currently, it is the only facility of its type in the United States. The FOIL is used to determine the safety performance of both new and existing roadside hardware when impacted by vehicles, and more importantly, for research leading to new, improved testing procedures which provide a greater degree of safety on our Nation's highways. The FOIL provides full-scale vehicle crash tests at moderate costs by using a reusable surrogate vehicle, called the bogie. Research can be undertaken in several hardware areas, such as sign supports, light poles, crash cushions, and roadside barriers.



THE BOGIE VEHICLE

OBJECTIVE - To provide a state-of-the-art research test facility with reasonably quick response to and close technical control over specified research programs deemed critical by FHWA.

RECENT RESEARCH PROGRAMS - The first bogie vehicle was developed for testing a variety of luminaire supports. Subsequently, it was used to determine the breakaway performance of currently accepted luminaire support systems when impacted with a lightweight (1800 lbs) vehicle.

A research program to determine significant vehicle parameters for modeling impacts with small base-bending sign supports was recently conducted. The results have formed the basis for the design of a second bogie vehicle to be used in evaluating small sign supports.

FUTURE PLANS - It is expected that the research conducted in the future will result in the development of new equipment and procedures for evaluating roadside safety hardware, specifications and procedures for the collection and archiving of FHWA-funded crash test data, improved film and transducer data collection and analysis techniques suitable for implementation, and defined side impact problems complete with actions FHWA should consider.

For further information, contact:

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