



2006

## Priority, Market-Ready Technologies and Innovations

# Positive Work Zone Protection Device (Balsi Beam)

### ***Problem:***

**Work zone crashes put workers and motorists at risk.**

Highway work zones have multiplied as agencies work to rebuild aging highway infrastructure. At the same time, traffic volumes and congestion continue to grow. This combination of increased work zones and higher traffic volumes means workers and motorists are forced to coexist, often in tight spaces. The challenge of maintaining work zone safety has become an issue of paramount concern.

Following a serious accident in California, the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) began to search for a way to improve the safety of construction and field crews, as well as motorists. A worker stationed behind an orange cone was simply no match for an errant motor vehicle. Caltrans Department of Research and Innovations researched concepts for a protection system that would not only protect workers, but would also increase the efficiency of highway construction projects.

### **Putting It in Perspective**

#### *Work zone statistics (2004):*

- Work zone accidents increased by 50% between 1997 and 2004.
- An estimated 115,000 work zone crashes occurred.
- An estimated 49,620 people were injured in work zone accidents.
- 1,068 work zone fatalities occurred.
- One work zone fatality occurred every 8.2 hours (3 a day).
- One work zone injury occurred every 9 minutes (160 a day).

### ***Solution:***

## **Positive Work Zone Protection Device (Balsi Beam)**

The Balsi Beam is an innovative device that serves as an extendable barrier to protect the flank of a work zone.

### **How does the Balsi Beam Work?**

Named after a worker injured in a work zone crash, the Balsi Beam provides 3 sides of positive protection for a 30' moveable work zone. The Balsi Beam includes its own tractor trailer truck to transport it to worksites at normal speeds without the need of special permits. Once it arrives at the worksite, crews can deploy the device in as little as 10 minutes. The trailer is designed so that each

side is built of high-strength steel box section beams that are able to extend an additional 4.6 meters (15 feet). With the use of hydraulic power, the beams are able to rotate left or right, depending on where protection is needed in the work zone. The trailer beams form a solid wall of protection that deflects vehicles away from workers. The Balsi Beam can be used in many types of work zones, including both median and shoulder areas.

### ***Successful Applications:***

### **The Balsi Beam is very effective in maintaining the safety of the work zone**

Mechanical engineers with Caltrans designed and contracted with Murray Trailer Company in 2003 to build a prototype of the Balsi Beam. The prototype was crash tested in 2003 and found to be very effective in maintaining the safety of the work zone, as well as oncoming traffic. The Balsi Beam has been in use with Caltrans since 2004.

Caltrans currently owns the only Balsi Beam and is conducting risk assessment and cost/benefit research to determine the best way to assign the unit for the most beneficial impact. Currently, the Balsi Beam is primarily used by Caltrans bridge maintenance crews, but evaluation of different maintenance activities is being conducted, including irrigation repair, culvert repairs, median repairs, and bridge inspections. In addition, Caltrans is evaluating opportunities to modify the current Balsi Beam to serve as more than just a barrier vehicle but also as a work vehicle that provides barrier protection.

Quantitative results of the benefits of the Balsi Beam will be available when the cost/benefit research is completed, but qualitative responses from work zone crews are very positive. Crews report the feeling of greater efficiency and safety when the Balsi Beam is deployed in their work zone.

Caltrans has a patent on the Balsi Beam. Other States are encouraged to apply for a license from Caltrans to build and use their own Balsi Beam.

#### **Benefits**

- Is able to be transported to a work site aboard its own tractor trailer at normal speeds without the need for special permits.
- Can be deployed in as little as 10 minutes.
- Provides 3 sides of positive protection for a 30' moveable work zone.

#### **Additional Resources**

Additional information about the Positive Work Zone Protection Device (Balsi Beam) is available at **[www.aashtotig.org](http://www.aashtotig.org)**.

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