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# Energy-Absorbing Roadside Barriers Using Bio-Inspired Architecture and 3D Concrete Printing

Researchers at Purdue University have developed an innovative energy-absorbing roadside barrier designed to provide optimal impact resistance while efficiently dissipating energy. This cutting-edge barrier system is specifically engineered to withstand high-impact loads, making it ideal for use in high-speed traffic areas and situations involving large vehicles, such as trucks.

The barrier's unique arrangement enhances its ability to flex upon impact and absorb energy, significantly reducing the risk of vehicle damage and improving safety during collisions. While various impact barriers exist, this novel design stands out due to its distinctive layered structure, ability to withstand high-impact loads, and its superior energy-depilation capabilities. All these features in combination work to ensure better protection for vehicles and passengers in the event of a collision.

**Technology Validation:**

Evaluations show that combining Bouligand and sinusoidal helioidal architecture with 3D concrete printing significantly enhanced roadside barrier and strength and energy absorption. These barriers outperform traditional concrete, offering superior impact resistance and safety performance.

**Advantages**:

-Enhanced Energy Absorption

-High impact load resistance

-Cost-Effective

-Lightweight

**Technology ID**

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**Category**

Buildings, Infrastructure, & Construction/Structural Health Monitoring

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**View online**

**Applications**:

-High-Speed Roads and Highways

-Urban and Suburban Streets

-Construction Zones

-Railroad Crossings

-Bridges

**TRL:** 3

**Intellectual Property:**

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**Keywords:** Energy-absorbing crash barrier,High-impact roadside protection,Advanced traffic safety system,3D-printed impact barrier,Bouligand structure reinforcement,Helicoidal concrete architecture,Vehicle collision energy dissipation,Lightweight safety barrier,Next-generation road infrastructure,Impact-resistant transportation barrier