

# EVOLUTION OF SPEED BREAKER

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## **Abstract**

*The easiest and traditional way to control the traffic is calming devices, which are well known as vehicle speed reducers, and these calming devices used to avoid accidents. Basically, two types of vertical as well as horizontal speed breakers are used around the world to quickly reduce speeds at reasonable levels for law enforcement. Some defective built and irregular speed breakers still cause several incidents, so these speed breakers are still in the glare of objections, but today the world is heading towards smart speed breakers that, compared to conventional speed breakers, may be safe and more environmentally friendly. The smart and new speed breakers across the globe have been examined in this review report.*

**Keywords:** Accident, Driving, Speed breakers, Traffic, Vehicles.

## **I. INTRODUCTION**

In the fast and furious world, the excessive feast is always on the shore-line of topmost vehicle producer companies. These vehicle companies try to build more and more furious vehicles as soon as technology approaches on the floor of the beast without thinking of the influences of such speed full vehicles over the environment and which leads to speedy driving with raising the chances of the catastrophic accident, but the question arises here how to control such over-speeding, which is the main cause of fata It is now very difficult for both developing and developed countries to regulate over-speeding, mostly fatal accidents due to over-speeding. A literature review shows that the key cause of accidents is over-speeding, lack of knowledge of road safety, drunk and drives[1]. Reckless driving, over-taking, violation of traffic rules and distraction this can include talking on cell phones, eating, texting and adjusting radio or music players. It might seem like an innocent thing to drive while being tired, but it is shown to be very dangerous and may be one of the causes of fatal accidents. According to a World Health Organization survey, injuries worldwide have caused 1.35 million deaths. India's Highways Ministry announced that 97,588 individuals died in 2018 due to over-speeding collisions, accounting for 64.4 percent of India's total fatalities, and also stated that road accidents increased 0.49 percent compared to 2017. A total of 4,67,044 road accidents have been registered by States and Union Territories in the last year, reporting 1.5 lac deaths and causing injuries to 4, 69,418 over-speeding individuals[2].

As per the report of World Road Statistics India placed in rank first for the number of road accidents across the 200 countries and India accounts for almost 11% of accident-related deaths in the world. Speed breakers or speed bumps, which are the traffic calming equipment, speed

breakers are mounted for the safety of drivers, are the cheapest and simplest way to regulate vehicle speed. If these speed breakers are imperfectly implemented and the design is abnormally implemented without the use of appropriate parameters, they can act as vehicle destroyers and increase traffic noise. Poorly-designed speed breakers that stand tall or with too-sharp an angle can disrupt drivers and can be difficult to negotiate even at very low speeds for vehicles with low ground clearance, many sports cars face problems with such speed bumps[3]. According to a The New York Times article revealing that speed bumps were constructed in Chatham, New Jersey in 1906, this method of vehicle speed retardation was debated in various businesses, but initially put into effect at Chatham. In 1953, the great physicist Arthur Holly Compton, where he was chancellor of Washington University, invented the speed breakers and afterwards he started designing various speed breakers, calling it a traffic control hump. As per one of the articles published by the Institute of Transportation Engineers, which stated that the first speed bump was built in the Netherlands in Europe in 1970. The behavior of vehicles at different geometries of speed bumps was extensively studied in the year 1973, according to a detailed study by the British Transport and Road Research Laboratory. The reports also reported that it is illegal to install speed breakers on public roads, but approved to be installed on private roads[4].

There are different types of speed breakers generally; calming devices (speed breakers) are divided into four different forms including speed bump, speed hump, speed cushion and ultimately speed table.

**Speed bump:** A small portion of the road surface is deliberately raised to force the public for safe and slow driving; the speed bumps are in the rounded structure. The height of speed bumps, which may vary in length, is usually from three to six inches. Most of these speed bumps are mounted on private roads and in parking lots. Speed bumps are often not used on public roads because if detected at too high speed, it causes considerable driver annoyance, so it is concluded that cars with speed bumps can slow down to around five miles per hour or even less[5].

**Speed humps:** Speed humps are usually circular, parabolic, or sinusoidal shaped which is the slightly raised area across the road which gently produces the rocking motions of vehicles that leads to slow down vehicle velocity up to 15-20 miles per hour. The speed humps are basically 3 to 4 inches in height, with a travel length of up to 22 feet. It is very effective in regulating vehicle velocity without any accidents and driving discomfort.

**Speed Cushions:** These are the small speed hump series that are mounted around the road with wheel cut-outs installed at a specific distance at specified widths. The type of velocity humps is separated by speed cushions. Speed cushions are selectively designed to regulate the speed of ordinary passenger vehicles while providing emergency vehicles with free passage[6].

**Speed table:** These are the flat-topped midblock traffic calming devices and are also described as an extended and wide speed hump. Speed tables are usually used for busy pedestrians or in suburban areas. The main goal of the speed table is to slow down the speed of traffic to a reasonable speed for motor vehicles. It is also used to redirect traffic to another non-traffic path. As discussed earlier, there are four types of speed breakers in total, but these vertical obstacles are most common and commonly used around the world out of these four, designed to slow down vehicle speed by causing mild discomfort[7].

There are various disadvantages of speed breaker

As discussed earlier speed breakers reduce the over-speeding vehicles and avoid the risk of accidents. There is much evidence that shows speed-breakers can reduce over-speeding of vehicles and diminishes the risk of accidents, but we can't deny that these speed breakers have also been famous to cause accidents and injuries.

#### Serious injuries caused by speed breakers

The influences of speed breakers have been evaluated in numerous studies which concluded that not only speed breakers are cause of accidents but also leads to serious damage to the human body such as. 1) Spinal-cord 2) Vertebral-compression 3) Disk-prolapse 4) Neck-pain 5) Slip-disk 6) Spine-injuries 7) Back-pain[8].

#### Unscientific and abnormal speed breakers cause of road accidents

Road transport and highway ministry of India reported that 9 people lose their lives in a day because of faulty and unscientific speed breakers and almost cause 30-50 accidents daily. One Indian report reports that unwieldy speed breakers could be equally deadly for those travelling on a bus or in some other vehicle, according to one report. A 20-year-old civil engineer fell down from the PMPML bus in June 2016 after being bumped by a defective speed breaker on the Pune-Mumbai highway at Phugewadi on the same day of the incident, a girl who was a resident of Chinchwad fell off the bus and suffered a severe head injury and died a few days later.

#### Damaging effects of speed breakers on vehicles

Most vehicles are getting declined and disintegrated due to bottom level damage such as the front bumper, engine oil pan gasket, brakes, suspension, tube tires, and many other critical internal parts get damaged by speed breakers[9].

#### Noise pollution by speed breakers

There are various sources of noise pollution such as industries, household gadgets like a mixer, grinder, vacuum cleaner, etc., constructions of City Street, highways, and public works but transportation is one of the major and consistent sources of noise pollution which is strenuous to avoid. The primary source of transport noise is road cars, airlines, and railways. According to a recent study that examined the impact of speed bumps on noise levels of road congestion, numerous voice samples of automobiles such as two-wheeler, three-wheelers, buses, cars, and lorries were measured under undisturbed traffic conditions before and after speed breakers and it was found that the highest noise volume varies from 71 to 80 dB without speed bumps but noise volume varies from 71 to 80 dB The results showed that there is a remarkable impact on the noise volume at a short distance from the speed bump by few categories of automobiles.

## II. CONCLUSION & DISCUSSION

This review article emphasizes the short literature review on traffic calming devices and the latest technology regarding it. It will be useful for researchers who are studying smart speed breakers, analysts, and government agencies. The creative ideas for the production of smart speed breakers from research around the world were explored in this review article. Traffic traditional calming devices are not now a complete solution to control over-speeding, as discussed earlier, the traffic calming devices have different drawbacks, but smart speed

breakers may be the best and safest solution for traffic control and over-speeding in this modern technological period. It is concluded that the world needs more smart and creative speed breakers for road-safe.

### III. REFERENCES

- [1] S. Deshpande, B. Kulkarni, and A. Joshi, "Electricity Generation Using Speed Breaker," *International Research Journal of Engineering and Technology (IRJET)*, 2016.
- [2] A. Mishra *et al.*, "Electricity Generation from Speed Breakers," *International Journal of Electrical and Electronics Research ISSN*, 2013.
- [3] A. Azam, M. A. Aslam, S. Ali, and F. Q. Yousef-Zai, "138. Speed Breaker Power Generator," 2016.
- [4] D. Garcia-Pozuelo, A. Gauchia, E. Olmeda, and V. Diaz, "Bump modeling and vehicle vertical dynamics prediction," *Advances in Mechanical Engineering*, 2014, doi: 10.1155/2014/736576.
- [5] M. Pau and S. Angius, "Do speed bumps really decrease traffic speed? An Italian experience," *Accident Analysis and Prevention*, 2001, doi: 10.1016/S0001-4575(00)00070-1.
- [6] M. Ramadan, M. Khaled, and H. El Hage, "Using Speed Bump for Power Generation-Experimental Study," 2015, doi: 10.1016/j.egypro.2015.07.192.
- [7] T. A. O. Salau, A. O. Adeyefa, and S. A. Oke, "Vehicle speed control using road bumps," *Transport*, 2004, doi: 10.1080/16484142.2004.9637965.
- [8] M. S. R. Jones and R. T. K. G. Santhosh, "A Break Free Path for Ambulance using Speed Breaker A Break Free Path for Ambulance using Speed Breaker," no. January, 2018.
- [9] C. Bose and H. Deepanjali, "Height Adjustable Speed Breaker and U-Turn Indicator," vol. 6, no. 3, pp. 240–244, 2018.