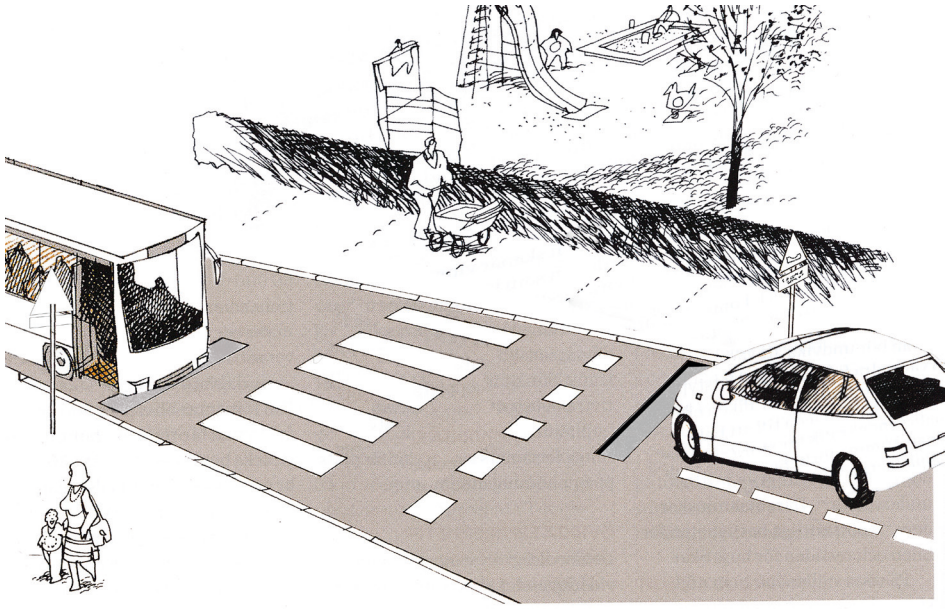
Actibump – For safer traffic



Dynamic traffic calming systems are selective. If the speed of the oncoming vehicle is above the speed limit an unevenness in the road surface is created to give the driver a physical reminder.

In some traffic environments a dynamic traffic calming system is the most cost effective solution. Especially in locations where traffic calming has proven to be difficult, or the solutions used have also had adverse effects. For example, where reduced road width, horizontal deflection, humps or cushions are to the detriment of emergency vehicles and buses.

A complicated traffic situation is usually a road with a high annual average daily traffic, frequent bus traffic, emergency vehicles and a large number of Non-Motorised Users (NMUs). On such roads, humps and other types of static hindrances negatively affect the day to day work environment of bus drivers. Static solutions also cause congestion, delays in public transport, cause delays in the response time of emergency vehicles as well as cause noise and vibrations.

A solution for such situations is the dynamic speed management system Actibump. It has proven to be a robust solution where speeding vehicles activate an inverted speed hump integrated into the road. As opposed to previous attempts at dynamic traffic calming Actibump has a hatch that is lowered a few centimetres into the road surface, creating a dent in the road. This has proven to be the key to a robust product with a long technical life span.

Actibump has an investment cost far below the cost of grade separation and doesn't have the negative impact on traffic flow that static humps do. In addition Actibump has the same affect on driver speed as average speed cameras.

Unlike static humps or speed tables, where all vehicles are affected by the discomfort of passing it, Actibump does not affect the comfort for legally driven vehicles – they pass on a level road. With Actibump

instead of a static solution the drivers can affect their own comfort. Speeders activate the hatch and it lowers into the road surface and gives the driver a physical reminder of the speed limit. But only those who speed are affected.

The system is managed through an internet based service. The municipal street department can set the speed limit and access services such as statistics for the location and set time and date restriction on the speed limit.

Yearly maintenance is recommended to reach the full technical life span of the Actibump.

ROAD SAFETY EFFECTS

Actibump has the same effect on speeding as an average speed camera does and the statistics show that these effect last.

Despite average speed cameras being a law enforcement issue the goal is not to make drivers pay a fine, the goal is to affect their driving behaviour. Using a system like Actibump the driver's behaviour is immediately affected by the physical reminder when speeding.

Using speed cameras the reminder does not arrive until the speeding ticket does. Statistics from the current Actibump installations show that the low speed levels are maintained or improved over time.

Actibump is fair, regardless of vehicle type. Statistics show that both large and small vehicles, as well as heavy goods vehicles, maintain the same low speed over a selective speed hump. This is not the case with static speed humps where lighter vehicles are able to drive faster than the speed limit without discomfort whilst heavier vehicles are forced to drive slower than the speed limit in order to avoid discomfort. The recommended maximum speed for a healthy work environment for bus drivers when passing a static hump is 20 km/h (in Sweden), corresponding to 13 mph. Maintaining a consistent speed over the Actibump is conducive to an even traffic flow. Instead of disrupting the traffic flow, Actibump facilitates it.

The primary advantage with the Actibump system is that it increases road safety without disrupting the traffic flow.

As the technology is relatively new and is only installed in a few places in Sweden; no long term studies have been performed. There is also no scientific research on this type of selective traffic calming yet. However, Linköping municipality is very pleased with their Actibump installation. It was installed in 2010. Speeding has decreased and top speeds are lower, as well as the number of accidents and serious injuries. The traffic flow has not been altered and the work environment of the bus drivers that pass the installation in Linköping has not been adversely affected.

EMERGENCY TRAFFIC

There are different solutions available for allowing emergency vehicles to pass the Actibump on a level road. For example, by using transponders.

PUBLIC TRANSPORT

An Actibump does not affect the route or journey time of public transport as they need not decrease their speed to pass the Actibump if the speed of the vehicle is within the limit.

There is also no negative effect on the work environment of bus drivers - as opposed to the static obstructions. The benefits of using a dynamic speed controlling system are many. From the view point of public transport it is ill advised to build static obstacles (speed tables, speed humps, cushions and the like) considering the work environment of the public transport drivers. Repeatedly passing over static obstacles generates neck and

back injuries. A risk the driver easily avoids by staying within the speed limit when passing a selective speed management system.

Choosing Actibump over a static obstruction helps the municipality reach goals of sustainable travelling. It is easier to plan a bus route when one need not consider the work environment problems of bus drivers caused by static obstacles.

ENVIRONMENTAL IMPACT

Actibump has a positive impact on the environment by contributing to a more even traffic flow causing less congestion, less idle running, lower fuel consumption and lower emissions.

There is a short increase in noise as a speeding vehicle passes the Actibump but no continuous noise and the noise level is not affected by legally driven vehicles.

ACCESSIBILITY

The Actibump system will optimise the traffic flow of roads with a high annual average daily traffic flow, with minimal bottle neck effect and without 85th percentile speed or top speed being too high.

If the majority of drivers choose to maintain legal speed the traffic flows more evenly. The congestion caused by sudden decreases and increases in speed, as is necessary when passing static obstacles, is avoided. This also positively influences the fuel consumption and the emissions.

Actibump does not negatively impact the accessibility of public transport, mobility services or long and/or wide transports.

SIGNS

Dynamic speed humps should be marked with special sign declaring that there is a speed activated hump. As the technology is relatively new some publicity and information might be necessary around the time of installation.

Fear that the obstacle might cause damage to vehicles exists but actual damage is very unlikely and only occurs under special circumstances. “Healthy” vehicles are not damaged, neither are legally travelling vehicles.

PLACEMENT

The retailer of the Actibump system will advise on placement of the installation.

Actibump was originally constructed for town and city environments but has also proven to be very effective at toll booths. This indicates that it would be suitable for installation in harbours, at airports and industries – anywhere there are pedestrians and cyclists sharing space with vehicles moving at high speed.

VULNERABLE ROAD USERS

The main reason for developing Actibump was to manage the speed of vehicles in situations around vulnerable road users in places where it is important to maintain an even traffic flow. Statistics show that speed is reduced, both top speed and 85th percentile speed, at sites where Actibump is installed.

Actibump has proven to be very effective on toll stations and has the potential to work very well in any situation where unprotected personnel are moving about and vehicles pass at significant speed.

MOTOR TRAFFIC SPREAD

Little to no motor traffic is anticipated to spread because of an Actibump installation.

CITY SCAPE

An Actibump installation requires a connection to local drainage and electricity. The city scape may also be altered somewhat by the presence of a speed detector (usually a radar on a pole).

COST AND EFFECT

The effect on speeding and accident rate of any traffic calming measure must be compared to the cost. Both investment and maintenance cost, as well as the civic cost of any negative side effects generated by the system, should be included in the calculation.

On roads where a large number of drivers do not comply with the speed limits and a large number of NMUs pass a lot of accidents happen. Accidents that could have been avoided all together or whose repercussions could have been minimized by sufficient traffic calming. One alternative for a crossing is to build a grade separation – if it is possible to build a good one. Reasons like time consumption or inconvenience can make NMUs keep crossing at grade with the traffic. A grade separation that is not used does not provide the desired safety effect and is both costly and creates a false sense of security for the motorised vehicles.

Actibump is made for places where a static obstruction is not a good solution. As such it is a cost effective solution providing a traffic calming effect and increasing the safety of non-motorised road users. The cost of an Actibump installation for two lanes is approximately 50,000 €, to be compared to the cost of, at least, 400,000 € for building a grade separation (in Sweden).

In situations where there are no traffic lights, or the present lights are not respected, or where the alternative is an average speed camera Actibump is a better option. Actibump gives an immediate reminder to those who speed. An average speed camera retroactively punishes the driver for speeding by sending a speeding ticket.

An Actibump system can be installed within three to four months of order (in Sweden).

MAINTENANCE

It is recommended to inspect the Actibump system once a year. The technical life span of an Actibump is approximately 10-12 years. Many static obstructions are worn out quickly and need to be adjusted or rebuilt within a few years. This entails closing the road and diverging traffic, which can be avoided by installing an Actibump instead.

Static humps cause problems for snow clearing and road cleaning vehicles, Actibump does not.

OTHER EXPERIENCES

Dynamic traffic calming has been tested in different varieties in several places the past ten years. They have not become an established solution as they have been built on technology where an obstruction has protruded from the road surface. This has created problems when the mechanical parts could not manage the dynamic loads exerted on them by passing vehicles. Poor system control and complicating snow clearing, road cleaning and maintenance has also caused problems.

The Actibump installation that has been in place in Linköping, Sweden, since 2010 has proven to be a robust solution that can handle hard weather and rough winters without complicating or hindering snow clearing or other road maintenance.

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