

# The Question of Speed Humps

By Paul Smith – Safe Speed



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***When failures in road safety result from drivers failing to properly deal with hazards, does it make any sense to improve road safety by adding road hazards?***

## Introduction

The author claims no special knowledge and no long term research into the overall effects of road humps or other so-called traffic calming schemes. Rather this article seeks to assemble the main arguments and set some standards for the degree of detail in which we must examine results.

Any road safety proposal is likely to provide a range of benefits and a range of disbenefits. If the benefits genuinely outweigh the disbenefits then we would regard it as a good scheme and might use the idea in many places across the road network.

There are two basic methods of evaluation of such proposals. We might determine through analysis what the likely effects and side effects might be and we might attempt to determine empirically what the effects are in a trial scheme.

If we are assessing the results of a trial it is far too easy to ignore side effects that might be present away from the scheme itself. It is quite possible that a side effect is so severe that the entire potential benefit is negated ten times over, but this may not be obvious from the trial results.

Changes to our road safety systems can be viewed as a disturbance of an existing equilibrium. The effects of the disturbance might be highly localised, or they might be far ranging and, at first sight, appear entirely unrelated to the changes.

Consider these examples of distantly related consequence.

A ferocious scheme of humps causes a local vehicle owner to trade in their saloon car for a monster 4x4. On a road 100 miles from home the 4x4 monster is involved in a crash that may have been avoided in a saloon car (given better handling). The total damage in the accident is greater than it would have been in the saloon car because of the greater weight of the 4x4.

One dark and wet night a driver fails to notice a speed hump and strikes it at moderate speed. Despite a nasty jolt, there does not seem to be any immediate consequence and the incident is soon forgotten. But two weeks later at high speed on a motorway the vehicle suffers an accident due to catastrophic tyre failure. Investigation reveals that the tyre suffered "rim crush damage" in the hump incident that led directly to the high speed failure.

Until we have a method for understanding the full nature of the consequences, both expected and unexpected, we should be very circumspect indeed about introducing deliberate schemes of hazards to our roads. Conversely, there may sometimes be potential benefits that seem so very compelling that we feel we must press ahead and install a scheme because to fail to do so may lead to lives not saved.

## **1) Benefits and potential benefits**

### ***Slower traffic might lead to fewer accidents***

Slower traffic will undoubtedly lead to fewer accidents if the speed of traffic was inappropriate in the first place. However it is highly uncommon to find locations where a large percentage of traffic travels at an inappropriate speed.

Contrary to common opinion, the essential road safety commodity: “time to react” is not delivered out of vehicle speed, rather it is delivered out of road user observation, anticipation and planning.

Another way we might find a benefit is in reducing or eliminating inappropriate speeds in use by a small proportion of drivers who are reckless or careless. A concern in this case is that we would be treating a symptom rather than a disease, and the reckless few may simply go and have their accident elsewhere. A more complete road safety approach would be to treat the reckless few by education or enforcement – engineering cannot change their nature or the behaviour that they have adopted as natural.

### ***Slower traffic might lead to accidents of lower severity***

As we examined briefly above, “time to react” and consequently crash severity are not really physics issues – rather they are issues of road user psychology. Crash severity is more a consequence of degree of road user error than it is a function of free travelling speed.

### ***Humps might divert traffic to other roads that might be more suitable***

Where a primarily residential road is used as short cut or to avoid congestion, we might conceive a scheme to redress the time advantage of using the short cut. If traffic diverts “back” to more suitable roads as a consequence we might well see accidents reduce on the short cut route, and this would primarily be due to the reduction in traffic. Assuming that the “more suitable” route is genuinely safer for traffic to use we might see a useful safety benefit.

## **2) Disbenefits and Side effects**

### ***Effects on drivers' attitudes***

While schemes of humps are frequently referred to as “traffic calming” schemes, they are not calming to drivers. In fact, better descriptions might be “driver enraging schemes” or “driver frustration schemes”. Since road safety depends on appropriate driver reactions to hazards, anything that has negative effects on the driver’s state of mind may well make him less effective at avoiding accidents. This is a very important effect that has not been researched as far as we know. Without suitable research it is hard to know the risks arising through the effect. They could well be substantial. It is common to witness aggressive driving between humps as drivers demonstrate their frustration.

### ***Damage to vehicles and goods in transit***

Hump damage to vehicles is a serious potential safety issue. Humps inevitably cause accelerated wear to suspension components including springs and suspension dampers, ball joints, bushes and wheel bearings.

But accelerated wear is not the only issue. We must also consider damage.

We have heard several reports of high speed tyre failure resulting from “rim crush damage”. It is thought that rim crush damage may sometimes be caused by more aggressive designs of speed humps.

### ***Dangers affecting cyclists and motorcyclists***

Two wheeled vehicles may have their stability affected by speed humps.

### ***Discomfort or even injury to vehicle passengers***

People with certain injuries hate speed humps with a passion. For them humps cause pain. For people with back pain humps may be intolerable. Every “wheeled” road user group is affected including Bus drivers and passengers.

### ***Delays to emergency services vehicles***

Clearly humps cause delay to emergency services vehicles. The London Ambulance Service recently estimated that delays caused by speed humps were responsible directly for the loss of 500 lives each year.

Fire service and Police vehicles will also be delayed, and on occasion such delays may cost lives.

### ***Distraction of drivers***

Speed humps are “artificial hazards” – items introduced to the road network that must be considered and negotiated by drivers. Drivers must pay attention to every road hazard, including speed humps. When they are paying attention to the humps, other hazards (which might include vulnerable road users) are receiving less attention. This could be quite dangerous.

### ***Unpleasant environment for drivers***

No driver enjoys negotiating speed humps. This contributes to a reduction in the quality of their lives. Below we dismiss quality of life arguments as subservient to safety arguments. However if the safety argument is lost or unclear then quality of life is highly significant.

### ***Traffic delays and congestion***

A major issue in modern times is travel efficiency. Speed humps clearly make travel less efficient. A particular problem is traffic that has diverted to avoid a scheme of humps. Such diversions tend to exacerbate congestion on through routes where there are less likely to be humps.

### ***Might contribute to an illusion of a safe environment***

Roads are dangerous. But a street with road humps may appear to be less dangerous to some road user groups. This reduction in apparent dangers may result in less careful behaviour, and less careful behaviour may result in new dangers. We would be especially concerned if parents took less care to keep young children under control in a speed hump zone, yet such behaviour seems inevitable to a greater or lesser extent.

### ***Drivers of stolen cars sometimes treat traffic calming measures as a challenge***

Clearly considerable danger could result from such behaviours. Local authorities should not be creating rally courses for drivers of stolen cars!

### **3) Quality of life arguments**

#### ***Humps may slow traffic and improve “quality of life” for residents and pedestrians***

The author immediately rejects “quality of life” arguments. The fact is that roads are dangerous and safety is a far higher ideal than quality of life. If a proposed scheme was genuinely safety-neutral then quality of life arguments could be considered. Since proposed schemes are highly unlikely to be safety-neutral, quality of life arguments are largely irrelevant.

However, we present some of the main quality of life arguments in this section because even if a scheme was safety neutral we can demonstrate that the quality of life argument will be lost as well.

#### ***Humps make driving unpleasant***

Some might claim that this is a good thing and might persuade drivers to use alternative transport methods. On the other hand an improvement in road safety would justify

#### ***Noise and vibration***

Humps result in complaints of noise and vibration. Braking for the hump, bumping over it, and accelerating again afterwards all result in noise and vibration. House values have been affected. People have complained about their sleep being disturbed and there are even reports of property damage from vibration.

#### ***Pollution***

Humps cause wider variations in vehicle speeds, with many vehicles slowing to a crawl to negotiate each hump. A natural consequence of a wider variation in speed with more acceleration and more braking is that more fuel will be used. If more fuel is used then more pollution is created. If traffic speeds are reduced journey times will increase and a baseline level of pollution (associated with mechanical inefficiency) will be delivered for longer periods.

## 4) Summary

While it might be hard to evaluate the full range of effects of road humps – some good and some bad – the effect on ambulance patients seems crystal clear.

In London in 1981, 274 pedestrians died in road accidents. By 2002 the annual toll had dropped to 107. This covers the main period of hump introduction in the London area. Even if we assume that the entire benefit of 167 lives was due to road humps (and clearly there are other factors) the 500 lives lost annually in ambulances claimed by the London Ambulance Service is three times greater. These figures alone are all that is needed to reject road humps as they have been used in London a potential road safety tool.

It is conceivable that either a) London conditions are special, and the same effects may not be present elsewhere, or b) that the schemes of humps used in London were less than the optimal design.

The relatively new information from the London Ambulance Service is, at the very least, a severe warning to anyone considering a scheme of road humps that they must examine in full detail the entire range of potential consequences. It seems highly unlikely that the benefits of such schemes will ever outweigh the disadvantages.

The author views road humps as inverted potholes. We should be facilitating transport systems and not interfering with the flow of traffic. We should aspire to safe and efficient roads free of obstruction wherever possible. It is worthy to compromise efficiency for safety, but without a compelling safety case transport efficiency should be the first priority.

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