Speed Humps on a Busy Minor Arterial: Powder House Boulevard – Somerville, MA

Site and Treatment Description

Powder House Blvd is a 0.9 mile two-lane road in a densely settled neighborhood of 2-family homes in northwestern Somerville, MA. It is 40 ft wide (curb to curb) with parking on both sides. Daily traffic that has been measured between 5,700 and 11,500. The statutory speed limit for built-up areas, 25 mph in Somerville, applies.

In February 2019, two pedestrians were struck and one, a schoolteacher, killed using the unsignalized crossing at Hardan Road, just outside the West Somerville Neighborhood School. Parents from this school and other residents had already been advocating for traffic calming on Powder House Blvd., and this tragedy intensified those demands. Within weeks, quick-response treatments were made at that crosswalk (rapid flash beacon, flex posts). In August 2019, three speed humps, 275 to 400 ft apart, were installed on the stretch between North Avenue and Curtis Street, which includes the Hardan Road intersection. A month later, a single bike lane was painted the length of the road (going eastbound for about half the road, westbound for the other half), which narrowed the travel lanes to 10 ft.

In 2023, 6 speed humps were installed on a different stretch of the road, between Packard Avenue and Powder House Circle, with an average spacing of 300 ft. Much of that stretch borders the Tufts University campus. Part of the impetus was continuing resident demands for additional traffic calming. Another part was the City's desire to make the bike lane in this stretch a parking-protected bike lane, which involved narrowing the travel lanes to 9.5 ft. Internally, transportation staff felt that speed control should be applied before marking lanes this narrow on a stretch with multiple horizontal curves.

In 2019, while the City had given its contractor a speed hump spec borrowed from the City of Boston for speed humps 3 inches high, the contractor made them 5 inches high; this deviation from the spec was not discovered until the next year. The humps installed in 2023 are 3 inches high.

Before-after Speed and Volume Results

On the western stretch which was treated in 2019 with 5" humps, 'before' measurements showed that the fraction of vehicles going faster than 25 mph (the speed limit) was 57% in 2017 and 32% in 2018. Measurements 6 weeks after installation found that less than 1% of vehicles were exceeding 25 mph, and that the daily traffic volume was almost the same as in 2018.

On the eastern stretch which was treated in 2023 with 3" humps, a 2019 measurement found that 59% of vehicles were speeding (> 25 mph), versus 11% 6 weeks after installation. Daily traffic volume had also fallen substantially when comparing 2019 with 2023 (7193 versus 5719).

'Before' measurements, made from 24 hours of video data, found that at unsignalized crosswalks, motorist compliance in yielding to pedestrians was only 49% at Leonard Street and 57% at Burhham Street. At Hardan Road, which had already been treated with flex posts and a lot of school-related signage, compliance was 78%. These measurements have not been repeated after treatment, but from casual observation, City staff believe that compliance is far better.

Design Specs and Cost

Somerville borrowed Boston's speed hump spec: 12 ft long, 3 in high, with a parabolic profile, made entirely of asphaltic concrete (hot mix), with an additional 2 inches embedded into the existing pavement after milling out 2 inches. They cost about $3,000 apiece.

As already mentioned, the speed humps installed in 2019 were actually constructed with a height of 5 inches. Compared to the 3" humps installed in 2023, the taller humps slowed traffic more; however, the shorter humps still managed speed well. The 5" humps led to frequent instances of cars bottoming out, resulting in one resident complaining about noise. The 3" humps, both those on Powder House Boulevard and those installed on other streets before 2023, did not generate any noise complaints.

Support Story

After the tragedy earlier in 2019, there was widespread support for doing *something;* however, in the general public, there was little agreement as to what measures to take. When the City announced in May 2019 its decision to install speed humps – some residents thought the measure wouldn't be strong enough (they wanted a raised intersection at the school), and others opposed it, although much of the opposition focused on parking removal, conflating the speed hump project (which did not affect parking) with a proposal for protected bike lanes (which were not implemented). After installation, resistance faded as residents saw that parking was not removed

and that speeding had been successfully controlled. Public officials saw the treatment as a great success and a catalyst for more substantial traffic calming elsewhere in the City.

The Fire Department was supportive of the proposed treatment in light of the recent tragedy. After installation, while the Fire Department did not complain, they requested that lower profile humps be used on primary response routes.

By 2023, there was strong consensus both that further traffic calming was needed and that speed humps were an effective treatment. There was almost no public opposition before installation and there have been no complaints since.

City staff feel that the speed control treatments have really changed the feel of the street, in spite of the large number of vehicles it serves. With speeding brought under control, it's much safer for everyone and particularly for pedestrians crossing the street and for cyclists who, except for one stretch of protected bike lane, are riding either in a conventional bike lane or in mixed traffic.

Maintenance Tips and Other Lessons

Pavement markings should be added as quickly after installation as possible, perhaps adding even more markings than are recommended in the MUTCD. Signs should be installed at the speed humps for plow drivers to know their location during snowstorms. Ahead of snow season, a map of speed hump locations should be provided to the city's DPW, and an annual snow drill held for plow operators to test-drive routes and experience any new traffic calming features.

Pavement is likely to degrade more quickly, particularly where taller speed humps are used, due to instances of vehicles bottoming out.

In 2019, a consultant had recommended managing speed on Powder House Boulevard using horizontal deflection. In line with a proposal to install protected bike lanes (not implemented), for which one parking lane would be removed, the idea was to alternate the remaining parking lane between the two sides of the street every 500 or 600 ft, forcing cars to shift with each switch. However, transportation officials felt that research had clearly shown that speed humps were the more effective and cost-efficient method of controlling speed.

Further Plans

Speed humps have proven to be effective at controlling speed, and the City continues to apply them. Based on their experience testing different height speed humps on several streets, they have made it a policy to use a 3" speed hump height on more major thoroughfares (which the Fire Department usually requests anyway) and a 4" speed hump height on minor streets that aren't used as regular fire response routes.