Municipality of Princeton
Municipal Building
400 Witherspoon Street
Princeton, NJ 08540-3496

Traffic and Transportation Committee

MEMORANDUM

TO: Mayor and Council
Robert Bruschi, Administrator

FROM: Princeton Traffic and Transportation Committee

DATE: July 3, 2013

SUBJECT: **Speed Bumps and Speed Humps Policy Recommendation**

Transmitted herewith please find the following relating to the Traffic and Transportation Committee's recommendation that the Princeton Council state its intent to no longer create new speed bumps or speed humps on its public streets.

- Power Point Recommended Policy Statement
- Documentation prepared by Traffic and Transportation Committee dated June 5, 2013 substantiating the Committee's recommendation
- Resolution for consideration by Council, endorsing Traffic & Transportation Committee's recommendation

Please contact Robert Altman, Traffic & Transportation Committee Vice Chairman or Robert V. Kiser, P.E., if you have any questions.

c: Linda McDermott, Municipal Clerk
Edwin W. Schmierer, Municipal Attorney
Kathy Monzo, Deputy Administrator/Director of Financing
Anton Lahnston, Chair, Traffic and Transportation Committee
Robert Altman,Vice Chair, Traffic and Transportation Committee
Robert V. Kiser, P.E., Director of Engineering
Deanna L. Stockton, P.E., Assistant Engineer
Sgt. Thomas Murray, Traffic Safety Officer
Robert Gregory, Director of Emergency Management
Dan Tomalin, Chief Princeton Fire Department
Frank Setnicky, Director of Operations, Princeton First Aid and Rescue Squad

PRINCETON TRAFFIC AND TRANSPORTATION COMMITTEE

Policy statement relating to the installation of speed humps and speed bumps on municipal streets within Princeton.

Speed bumps and speed humps

- Speed bumps are typically 3" to 4" high and 12" to 18" long
  - Speed bumps are uniformly discouraged in areas other than parking lots and private roads
- Speed humps are typically 3" to 4" high and 10' to 14' long
  - Speed humps are typically used on public roadways
  - In New Jersey, their use is limited by statute to certain local ("self-contained") roads which have fewer than 3,000 vehicles per day and a posted speed

There are several risks and benefits associated with the installation of speed humps as a method of traffic calming – as well as competing public interests and the complex definition of "overall citizen safety"

Some of the risks include include

- A negative impact on the environment (caused by increased numbers of accelerations and decelerations)
- Increased cost and complexity of resurfacing the roadway
- Potential drainage issues on some streets
- Damage to vehicles, with increased risk as the weight of the vehicle increases

Speed humps force all vehicles to reduce their speed

- One study included approximately 600 passenger cars, SUVs, service trucks, and buses, etc.)
  - At posted speeds of 25mph, the average speed of all vehicles crossing 12' speed humps was 9.6mph, and the 85th percentile speed was 12.3 mph
- Another study included three kinds of emergency vehicles*
  - At the two desired (most typical) speeds (25mph and 35mph), the average time for the three types of apparatus to cross *a single speed hump* was increased by 3.6 seconds over the time required without speed humps in the road.
- The American Heart Association reports that "For every minute lost in the resuscitation process (for cardiac arrest), the risk of death increases by 10%.

***Pierce Telesquirt Fire Engine [47,360 lbs.], Pierce Aerial Platform Fire Truck [74,120 lbs.], and Ford/Braun Ambulance**

IN PRINCETON

- There are 125.05 miles of road, of which 96.62 (77%) are posted 25mph

- Princeton Fire responded to:

  - 3 building fires, among 225 total incidents in 2013 (YTD)
  - 13 building fires, among 908 total incidents in 2012
  - 11 building fires, among 1008 total incidents in 2011

- Princeton Police responded to:

  - 5 car/pedestrian and 5 car/bicycle accidents in 2013 (YTD)
  - 6 car/pedestrian and 7 car/bicycle accidents in 2012 (Twp. Only)
  - 4 car/pedestrian and 3 car/bicycle accidents in 2011 (Twp. Only)

- Princeton First Aid & Rescue Squad transports:

  - approximately 2,100 patients per year, of which
  - approximately 160 (7.5%) are patients suffering heart attack or stroke.

MOTION

The Traffic and Transportation Committee recommends that Princeton state its intent to no longer create new speed bumps and speed humps on its public streets.

RESOLUTION 2013-R
OF THE MAYOR AND COUNCIL
OF THE MUNICIPALITY OF PRINCETON
REGARDING SPEED BUMPS AND SPEED HUMPS

WHEREAS, N.J.S.A. 39:4-8.10 concerning the Construction of Speed Humps and Traffic Calming Measures by Municipalities and Counties limits the construction of speed humps to residential roadways under municipal or county jurisdiction with a posted speed of 30 mph or less and which have fewer than 3,000 average vehicles per day; and

WHEREAS, eighty three percent (83%) of Princeton's municipal roadways have a posted speed of 30 mph or less; and

WHEREAS, the former Borough permitted the installation of speed humps and speed bumps; and

WHEREAS, the former Township Committee approved a Traffic Calming Policy on February 25, 2002, which prohibited the installation of speed humps, speed bumps, and raised traffic islands on municipal streets within Princeton Township; and

WHEREAS, the Princeton Traffic and Transportation Committee compiled data regarding speed humps, including their negative impact on the environment, the increased cost and complexity of roadway maintenance, increased risk of vehicle damage, and the decreased response time for emergency response vehicles; and

WHEREAS, the Traffic and Transportation Committee endorses a consolidated speed hump and speed bump policy that prohibits the future creation of new speed bumps or speed humps on Princeton's municipal streets; and

WHEREAS, the Princeton Police Department, Emergency Management, Fire Department, and the Princeton First Aid and Rescue Squad endorse the prohibition of speed bumps and speed humps on Princeton's municipal streets; and

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Council of Princeton that the attached Princeton Traffic and Transportation Committee's Policy Statement Relating to the Installation of Speed Humps, Speed Bumps and Raised Traffic Islands on Municipal Streets Within Princeton be fully endorsed and hereby states its intent to no longer create new speed bumps or speed humps on Princeton's municipal streets.

Councilperson	Absent	Present	1st	2nd	Yea	Nay	Abstain	Disqualified
Ms. Butler								
Mrs. Crumiller								
Ms. Howard								
Mr. Liverman								
Mr. Miller								
Mr. Simon								
Mayor Lempert								

I, Linda S. McDermott, Clerk of the Municipality of Princeton, do hereby certify that the above is a true and complete copy of a resolution adopted by the Mayor and Council of said Municipality at a meeting held July 8, 2013.

IN WITNESS WHEREOF, I hereunto set my hand and affix the corporate seal of said Municipality, this 8th day of July, 2013.

Linda S. McDermott
Municipal Clerk

PRINCETON TRAFFIC AND TRANSPORTATION COMMITTEE

Policy statement relating to the installation of speed humps, speed bumps and raised traffic islands on municipal streets within Princeton

June 5, 2013

In late 2001, following citizens' expressions of concern about the increasing speed and volume of traffic on local streets, the Princeton Township Traffic Safety Committee undertook a review of traffic calming alternatives. The resulting report, attached as Appendix I, reviewed the advantages and disadvantages of various methods of speed calming as they relate to the conflicts of competing public interests and the complex definition of "overall citizen safety."

The original report described three categories of issues and conflicts:

- the issue of overall public safety, within which there are conflicting priorities
- the impact of traffic safety on the environment (e.g. increased numbers of accelerations and decelerations), and
- the increased risk of lawsuits and of increased municipal civil liability (e.g. ADA, EMS response times).

With respect to public safety, the report noted that

> "overall citizen safety.... includes not only local pedestrian and bicycle safety, but also emergency response time for police, fire, and ambulance. Regrettably, to the extent that traffic calming succeeds in requiring all vehicles to reduce speed, data strongly suggest that the overall impact on citizen safety is negative, due particularly to increased response time for emergency service vehicles such as EMS, fire, and police.... These data are of particular concern when combined with data from the American Heart Association (AHA Journal Report, 11/9/01) which show that 'For every minute lost in the resuscitation process (for cardiac arrest), the risk of death increases by 10 percent.'"

Recognizing that some methods of traffic calming "can be beneficial without creating undue problems," the report continued that existing data "also suggest strongly that some traffic calming devices – specifically speed humps, speed bumps, and raised traffic islands – create not only the three general risks, but also significant risk of damage to emergency vehicles and of injury to emergency service workers." The report concluded, "that the risk to emergency service workers, emergency vehicles, and the general public relating to the installation of speed humps, speed bumps, and raised traffic islands outweighs any

benefits derived." Accordingly, the Traffic Safety Committee proposed that "The Township therefore prohibit[s] the installation of these types of devices on municipal streets within Princeton Township."

The Committee's report was reviewed by Township Committee on February 25, 2002, when "It was the consensus of Township Committee to accept for use the Traffic Calming Report as presented by the Traffic Safety Committee."[i]

In 2004, New Jersey enacted a law (Attachment II) that created conditions under which a municipality may construct a speed hump: "on totally self-contained two-lane residential streets and on totally self-contained one-way residential streets under municipal jurisdiction which have no direct connection with any street in any other municipality, have fewer than 3,000 vehicles per day, with a posted speed of 30 mph or less, and on one-way streets connecting to county roads."

Today, a Google search for "speed humps" yields over 1,000,000 results but, if the first several hundred results are any indication, there is little new information available. In addition to advertisements for speed bump/hump installation, there are many documents that present the pros and cons of speed humps, occasionally in the broader context of traffic calming. Increasingly, speed bumps (3" to 4" high and 12" to 18" long) are now distinguished from speed humps (3" to 4" high and 10' to 14' long), and speed bumps are uniformly discouraged in areas other than parking lots and private roads.

For speed humps, the message continues to be more nuanced, with documents generally citing the same advantages and disadvantages as those reported in the earlier Traffic Safety Committee report. One exception is "Safe Routes to School Online Guide,"[ii] which among its four "Key Factors to Consider," includes "Potential drainage issues on some streets", "increase in cost and complexity of resurfacing", and "appropriate design important to prevent motor vehicle passenger discomfort."

At least two studies, conducted in Portland, OR (1996) and Eugene, OR (2000), have looked specifically at the impact of speed humps on response time for emergency response vehicles.[iii] Similar in design and findings, these studies measured the additional time required when specific emergency response vehicles (e.g. Pierce Telesquirt Fire Engine [39,000 lbs.], Pierce Aerial Platform Fire Truck [66,000 lbs.] and Ford/Braun Ambulance) travel on routes with speed humps. According to the Eugene study (p. 28), "The results… indicate that at the two desired speeds (25 and 30 mph), it took an average of 3.6 seconds longer for the three types of apparatus to cross a single speed hump than it would have taken if the apparatus had been able to response without slowing for the traffic calming device…." with the time lost directly related to the weight and wheel base of the vehicles.

Although designed for a somewhat different purpose – to compare the effect of speed humps, speed slots, and speed cushions – a study presented at the 2004 meeting of the Institute of Transportation Engineers (ITE)[iv] collected data for seven kinds of vehicles (e.g. approximately 600 passenger cars, SUVs, service trucks, and buses, etc.). In a series of tests in streets posted at 25 MPH, the average speed of all vehicles crossing 12' speed humps was 9.6 MPH, and the 85th percentile speed was 12.3 MPT. The 85th percentile

speed is the speed at or below which 85 percent of people drive at any given location under good weather and visibility conditions, which is considered the maximum safe speed for that location, and is the speed on which speed limits are based in New Jersey and most other states.

In sum, it is clear that speed humps work, reducing speed for virtually all vehicles – and/but particularly for heavier (i.e. EMS and fire) vehicles.

* * * * *

Looking to the future, what should be Princeton's policy about creating new speed bumps or humps? As was true a decade ago, the answer requires balancing competing public interests and the complex definition of "overall citizen safety."

While there is no question but that speed humps can lower speed on residential roads, reducing the potential for accidents, it is also true that speed humps will lower speeds (and increase response time) for emergency vehicles, greatly increasing the risk to emergency service workers and vehicles, and particularly to the general public as response times become longer. And, since the proportion of the population that is over 70 is considerably higher in Princeton than in New Jersey or the U.S,[v] the risk of slower response times is increased.

Accordingly, the Traffic and Transportation Committee recommends that Princeton state its intent to no longer create new speed bumps or speed humps on its public streets.

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[i]Minutes of the meeting of the Princeton Township Committee, February 25, 2002.

[ii]http://guide.saferoutesinfo.org/engineering/speed_humps.cfm , accessed May 31, 2013.

[iii]Bureau of Traffic Management, Portland Department of Transportation "The Influence of Traffic Calming Devices on Fire Vehicle Travel Times," January, 1996, available at http://www.portlandoregon.gov/transportation/35934. accessed May 31, 2012, and Taylor Robertson, "Speed Hump Impacts on Emergency Response Times," Eugene Fire and Emergency Medical Services, Eugene, Oregon, October 15, 2000, available at http://www.usfa.fema.gov/pdf/efop/efo19594.pdf, accessed May 31, 2013.

[iv]L Johnson and A. J. Nedzesky, "A Comparative Study of Speed Humps, Speed Slots, and Speed Cushions", available athttp://www.ite.org/traffic/documents/AB04H1502.pdf, accessed May 31, 2013."Speed slots are similar to speed humps in that they extend across the roadway but they have "slots" or tire grooves along each side of the centerline in order to allow emergency response vehicles to avoid of the device by driving through the slots along the middle of the road. Unfortunately the emergency vehicle must straddle the centerline and travel in both lanes of the roadway, increasing the risk to both the emergency vehicle as well as other vehicles. Speed cushions are smaller than lane width and are rectangular or square in shape.[(5)] These characteristics allow for an emergency response vehicle to straddle the cushion while remaining in its respective lane. Figure 3 shows the typical dimensions and layout of speed humps, slot and cushions." p.4.

[v]Ralph Widner, Table 4 ("Percentage of Age Groups in Population and Median Age Compared"), *Princeton and Greater Princeton; A Statistical Portrait* ;Princeton Future, 2013.

ATTACHMENT I

PRINCETON TOWNSHIP TRAFFIC SAFETY COMMITTEE

Policy statement relating to the installation of speed humps, speed bumps and raised traffic islands on municipal streets within Princeton Township.

February 11, 2002

Increasingly – and understandably – residents of Princeton Township have expressed concern about the growing amount of traffic on Township streets, about the increased speed at which that traffic appears to be moving, and about the increased risks to residents' safety suggested by this increased volume and speed. Many residents – acting individually, or as a neighborhood – have sought assistance from Township elected public officials, and/or from the Township's Traffic Safety Committee.

Most residents recognize that it is virtually impossible for one municipality to effectively reduce the overall traffic volume in an area, and that reducing volume on one street simply pushes traffic to nearby streets, hardly an appropriate solution for the Township as a whole. Given that traffic volume likely cannot be reduced, residents reasonably believe that their safety can and should be increased by controlling traffic speed – a process known as "traffic calming". As defined in *Traffic Calming: State of the Practice,* (Ewing Reid, Washington, D.C.: Institute of Transportation Engineers, August 1999, p. 2) "traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users….,"* including but not limited to speed humps and speed bumps, center islands, traffic circles, and street closures.

Traffic calming can be encouraged by a variety of methods, and these methods have been tried in a variety of communities, several of which have been studied (Austin [TX], Berkeley [CA], Boulder [CO], Fresno [CA], Gwinnett County [GA], Montgomery County [MD], Portland [OR], Sacramento [CA], and Sarasota [FL]). Perhaps disappointingly, however, most U.S. local governments have suspended or placed their traffic calming programs in moratorium after careful (but often belated) consideration of the broader range of issues involved and of the conflicts among competing public interests that were generated.

These issues and conflicts fall generally into three categories. First is the issue of overall citizen safety, which includes not only local pedestrian and bicycle safety, but also emergency response time for police, fire, and ambulance. Regrettably, to the extent that traffic calming succeeds in requiring all vehicles to reduce speed, data strongly suggest that the overall impact on citizen safety is negative, due particularly to

increased response time for emergency service vehicles such as EMS, fire, and police. (See studies from Austin., Berkeley, Boulder, Montgomery County and Portland, all cited and summarized in Bunte, pp. 50ff.) These data are of particular concern when combined with data from the American Heart Association (AHA Journal Report, 11/9/01) which show that "For every minute lost in the resuscitation process (for cardiac arrest), the risk of death increases by 10 percent."

Closely related is the issue of the impact of traffic calming on the environment, since most traffic calming requires both deceleration and re-acceleration, with concomitant implications for emissions: "various studies have been conducted in Australia, Austria, Denmark, Germany, Holland, Sweden and the United Kingdom, which show that vehicle emission pollutants, along with fuel consumption, are increased with traffic calming devices, particularly speed humps." (Bunte, page 65)

Finally, although of less direct relevance to citizen safety, use of traffic calming devices also raises increased risks of lawsuits and of increased municipal civil liability (e.g. ADA, EMS response times) which need to be considered. (Bunte, pp. 80ff)

Despite these issues and risks, there remains evidence that some methods of traffic calming (e.g. painted street lines) can be beneficial without creating undue problems. However, the same data cited above also suggest strongly that some traffic calming devices – specifically speed humps, speed bumps, and raised traffic islands – create not only the three general risks, but also significant risk of damage to emergency vehicles and of injury to emergency service workers.

As a result, the Traffic Safety Committee recognizes that there are (and will continue to be) some circumstances in which some kinds of traffic calming devices and policies will be, on balance, of benefit to the community at large. At the same time, the Traffic Safety Committee believes that the risk to emergency service workers, emergency vehicles, and the general public relating to the installation of speed humps, speed bumps, and raised traffic islands outweighs any benefits derived. The Township therefore prohibits the installation of these types of devices on municipal streets within Princeton Township.

ATTACHMENT II

CHAPTER 107

AN ACT concerning speed humps on certain streets and roads and supplementing Title 39 of the Revised Statutes.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

C.39:4-8.9 Definitions relative to speed humps.

1. As used in this act:

"Department" means the Department of Transportation.

"Private roads" means semipublic or private roads, streets, driveways, parkways, parking areas, or other roadways owned by a private person, corporation or institution open to or used by the public for the purposes of vehicular travel by permission of such persons, corporations or institutions and not as a matter of public right.

"Speed hump" means a physical alteration to the horizontal and vertical alignment of a road surface used as a traffic calming measure and conforming to the technical standards established by the Department of Transportation.

C.39:4-8.10 Construction of speed humps by municipality.

2. Pursuant to the provisions of section 3 of this act, a municipality may construct a speed hump on totally self-contained two-lane residential streets and on totally self-contained one-way residential streets under municipal jurisdiction which have no direct connection with any street in any other municipality, have fewer than 3,000 vehicles per day, with a posted speed of 30 mph or less, and on one-way streets connecting to county roads. The board of directors of any corporation, or the board of trustees of any corporation or other institution of a public or semipublic nature not for pecuniary profit, having control over private roads, may construct or provide for the construction of a speed hump on any private road subject to the provisions of Title 39 of the Revised Statutes, pursuant to P.L.1945, c.284 (C.39:5A-1 et seq.).

C.39:4-8.11 Conformance of speed humps to DOT standards.

3. Any speed hump constructed by a municipality or a board of directors or trustees shall conform in design and construction to the technical standards established by the Department of Transportation.

A municipality or board shall provide advance warning, including but not limited to, the erection of appropriate signs giving notice of the presence of speed humps before the first speed hump in a series of speed humps and provide for a pavement marker to be placed at the location of the first speed hump. The signing and pavement markings for a speed hump shall conform to the current standards prescribed in the Manual of Uniform Traffic Control Devices for Streets and Highways as adopted by the Commissioner of Transportation.

4. This act shall take effect on the 120th day after enactment.

Approved July 14, 2004.