



Princeton Engineering Department

Municipal Evaluation of the One Way Street Alternative for Valley Road

September 2015

At the Neighborhood Design Meetings, the option of turning Valley Road into a one-way street was raised by an audience member. The following evaluation is provided to shed light on one-way streets.

Valley Road and Terhune Road have the same roadway classification designation as minor collectors in the Princeton Community Master Plan (<http://www.princetonnj.gov/masterplan/Roadway-Classification-Map-Adopted-PNJ.pdf>). Valley Road currently has a 5-ton weight limit restriction. Terhune Road does not have this restriction and is part of the designated NJ Transit bus route serving Mercer County and lower Somerset County. The smaller freeB daytime bus is currently routed along Valley Road. http://www.princetonnj.gov/Transit_Routes.pdf Both transit services have stops on Witherspoon Street and at Princeton Shopping Center; there are no stops on Valley Road or Terhune Road.

In most cases, one way roads are paired in a couplet to balance the traffic volumes on the roadways. In this case, Valley Road and Terhune Road between Witherspoon Street / Mount Lucas Road and Harrison Street could be a one-way couplet. A one-way couplet does not need to be created; however, it may result in excessive vehicular traffic on Terhune Road, a parallel roadway with the same functional classification but with horizontal and vertical curvature near Mount Lucas Road.

An internet search on one way streets yields many results. Some of the favorable and unfavorable impacts associated with one way streets as follows:

- The volume of cars and roadway speeds increase on a one way street.
- Vehicle crashes may be more severe due to higher roadway speeds.
- The potential for head on collisions increases due to wrong way drivers.
- More vehicle miles may be driven as vehicles travel out of their way to the same destination, increasing the number of turns required and intersections to be negotiated. This results in higher vehicle emissions and more fuel usage.
- More vehicle / pedestrian conflicts may result due to the increased number of vehicle turning movements required by one way systems; other research shows that pedestrian accidents decline.
- One way streets accommodate more on street parking.
- One way streets are undesirable for transit users as it increases the distance of routes.
- Left turn movements in and out of driveways have less conflicts.
- Emergency services response times may be increased due to circuitous routes.
- Two way roads are less confusing, especially to visitors.

A few of these website results are provided below:

- <http://www.washingtonpost.com/blogs/wonkblog/wp/2015/04/17/why-one-way-streets-really-are-the-worst/>
- http://planphilly.com/sites/planphilly.com/files/Glatting_One%20Way%20Streets.pdf
- <http://www.debunkingportland.com/one-way-streets.htm>
- <http://www.citylab.com/commute/2013/01/case-against-one-way-streets/4549/>
- <http://outfrontonline.com/dwell/denver-urbanism/urbanism-101-the-benefits-and-drawbacks-of-one-way-city-streets/>
- <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.417.4687&rep=rep1&type=pdf>
- http://www.pedbikeinfo.org/planning/facilities_calming_one-way-convert.cfm
- <http://www.ci.hillsboro.or.us/modules/showdocument.aspx?documentid=3846>

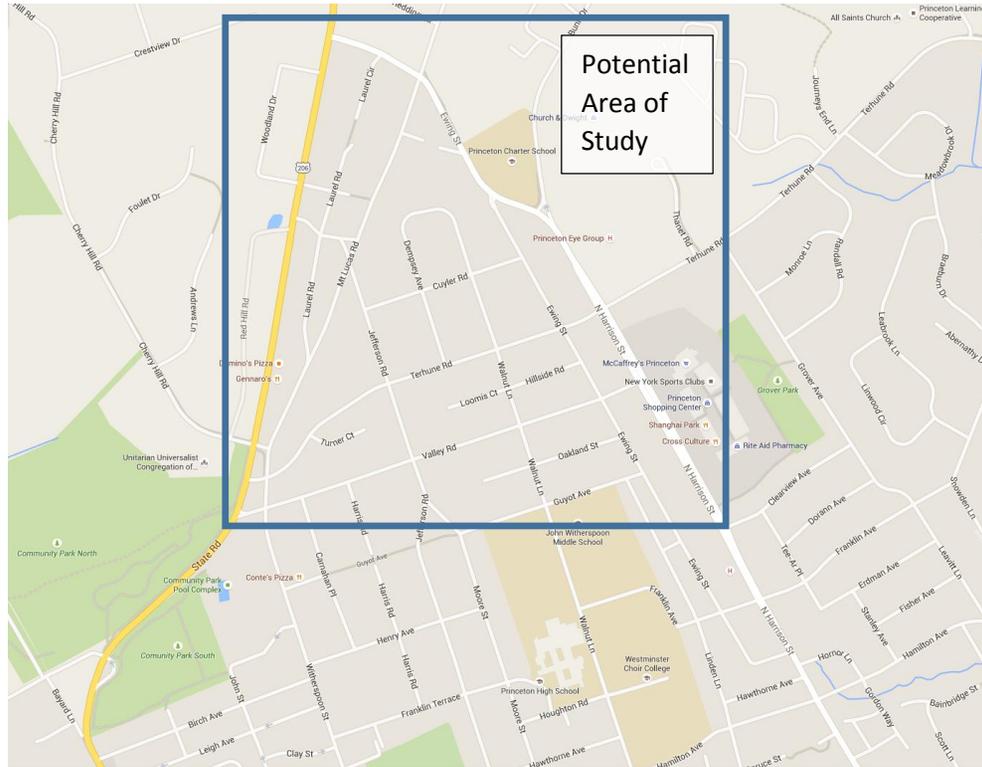
If a one-way couplet is desired, the following must be considered:

1. Policy Modifications:

- Removal of the Valley Road 5-ton weight limit restriction to permit NJ Transit bus and other service vehicle traffic.
- Adjustment of the NJ Transit bus route to travel on both Valley Road and Terhune Road, subject to approval by the New Jersey Department of Transportation Commissioner.

2. Traffic and Circulation Studies:

- Review and possible change of stop intersections on Valley Road, Terhune Road, Jefferson Road and Ewing Street. Currently, Jefferson Road has the uncontrolled movement at Terhune Road; if Terhune Road is changed to one-way travel, the traffic volumes may increase and require a change to the stop-controlled roadway condition, as the lower volume road is designated as the stopped roadway.
- Review bus and truck turning movements in the area and safe access to northbound and southbound Route 206 via Harrison Street, Valley Road, Terhune Road, Jefferson Road, and Ewing Street. The creation of a one-way couplet will affect how traffic in this section of town finds access to Route 206. Volumes may increase at certain intersections, creating reduced level of service and reduced safety due to an increase in accidents.
- Study of Mount Lucas Road and Harrison Street traffic queues and turn lane pocket lengths needed between the Terhune Road and Valley Road intersections, as they will be affected when vehicles movements are concentrated in specific directions on the one-way streets.



3. Roadway Changes:

- Roadway redesigns at Harrison / Terhune and Harrison / Valley to eliminate and / or lengthen turning pockets as necessary.
 - The intersection redesign at Harrison / Valley may have an impact to the private property of the Princeton Shopping Center due to the change of traffic movements.



- Traffic signal timing modifications at Harrison / Terhune, Harrison / Valley, and Valley / Mount Lucas to address turning and through movement changes.
- Roadway redesign on Mount Lucas Road between Cherry Hill Road and Valley Road.
- Intersection changes along Valley Road and Terhune Road to minimize the ability for wrong-way drivers to enter the roadway.
- Increased signage at all cross street intersections with Valley Road and Terhune Road to indicate one-way roadways for both motor vehicles and bicyclists.
- Appropriate traffic calming treatments to slow traffic on the one-way roadways, as some studies show that traffic speeds increase when roadway friction in the form of opposing traffic is removed.
- Appropriate accommodations to effectively move bicyclists through the one-way couplet in the correct direction.