

Roundabouts and Other Traffic Calming Initiatives for Downtown Safety Village of Great Neck Plaza, NY

Jean Celender, Albert Dawson and Raymond DiBiase

Abstract. The Village of Great Neck Plaza, a suburban incorporated village located on Long Island, NY, has embarked on a comprehensive program to improve pedestrian safety through traffic calming initiatives. The Village is densely populated containing approximately 90 multiple-family apartment buildings, forty-five office buildings, a Central Business District with 260 boutique stores, two senior independent living facilities, a nursing home, three parks and the Great Neck station of the Long Island Rail Road, which serves as a transportation hub for the entire Great neck peninsula. As a result, this small community, only one-third of an acre in size, is subject to gridlock conditions in the area adjacent to the train station and commercial district, speeding vehicles approaching the Village on wide arterial streets and pedestrian safety problems associated with busy city centers. The over-65 population in the Village is increasing, and this age group now comprises over 30% of the population and growing each year.

This paper will address the traffic calming initiatives completed by the Village and those underway to address vehicular and pedestrian safety, including a modern roundabout, illuminated pedestrian crossing signs, electronic speed awareness devices, countdown type pedestrian signals, enhanced crosswalks, and a road diet. This program has been funded primarily by the New York State Department of Transportation through its Local Safe Streets and Traffic Calming grants. It will discuss the techniques employed and ways in which constrained municipal budgets can be leveraged to benefit the safety of pedestrians who walk the Village streets.

INTRODUCTION

The Incorporated Village of Great Neck Plaza (hereinafter referred to as “Village”) is located on Long Island, NY, just east of the New York City line. Although the Village is small, approximately one-third of a square mile in area, it contains the Central Business District comprised of 250 boutique stores and service establishments, approximately ninety multiple-family apartment buildings, forty-five office buildings, a nursing home, and two senior independent living and assisted care facilities. The Village contains the Great Neck Long Island Rail Road (LIRR) train station, serving as the commercial and transportation hub for the entire Great Neck Peninsula, which encompasses eight other villages and several unincorporated areas of the Town of North Hempstead.

As a result, the Village is subject to the same traffic and pedestrian safety problems that are associated with busy city centers. These problems vary from gridlocked conditions in the commercial area adjacent to the LIRR station, to speeding vehicles approaching the commercial area. Since the Village has a large number of senior citizens, as well as two three senior care facilities, much of the pedestrian traffic is comprised of slower-moving and slower-reacting older adults. The over-65 population in the Village is increasing, and this age group now comprises over 30 percent of its population. The Village Mayor and Board of Trustees have been for many years committed to improving the safety of pedestrians who walk the Village streets.

To address these concerns, the Village is mid-way through a comprehensive, multi-project program to improve pedestrian safety by calming traffic, enhancing the visibility of pedestrians to approaching motorists, and improving safe crosswalk usage.

This program is funded primarily by the New York State Department of Transportation through its Local Safe Streets and Traffic Calming (LSSTC) grants. It employs the following techniques:

- **Roundabouts** to calm traffic and improve pedestrian safety at crosswalks
- Overhead **illuminated pedestrian crossing signs** at mid-block crossings
- Electronic **Speed Awareness Devices** to reduce motorists' speeds
- **Reduction in the number of through lanes in a "road diet,"** which removes excess travel lanes, reduces speeds and optimizes the flow of vehicles
- **"Countdown-type" pedestrian signals** to enhance pedestrian crossings and lessen confusion

Due to the fact that some of these improvements are either recently-constructed (i.e., Great Neck Road in the summer of 2008), or in the preliminary design phase, quantifiable results, in terms of a reduction in the number of traffic accidents involving pedestrians, cannot yet be obtained. Since pedestrian accidents are typically severe, in terms of the likelihood of pedestrian injuries and deaths, the Village views an even slight reduction in the number of accidents to be significant. Based on the combination of these techniques, this reduction should be readily-achievable on all of these village traffic calming projects.

However, the first LSSTC constructed project, the Barstow Road roundabout, has had a post-construction analysis performed in 2006, which contained the following findings:

- safer intersection with reduced potential for conflicts (8 conflict points for roundabout versus 32 potential vehicle-to-vehicle conflicts for a typical intersection).
- separation of pedestrians from vehicular movements in the circle with designated walkways and railings to keep pedestrians away from vehicles in circulatory roadway
- proven to be safer for motorists, pedestrians and bicyclists, including public reaction that it "feels safer;" fewer accidents reported in the three years following construction
- moves traffic more efficiently and with less delay
- less air and noise pollution
- more aesthetic treatment with plantings in central island

PROJECT OBJECTIVES

The goal of the Village’s multi-project program is to improve pedestrian safety. This is being accomplished by the following techniques:

- Calming traffic flow by:
 - Constructing roundabouts
 - Installing Speed Awareness Devices
- Improving safety at pedestrian crossings by:
 - Improving traffic control at intersections (e.g., roundabouts)
 - Introducing sidewalk “bulb-outs” to shorten pedestrian crossings
 - Installing decorative fencing to direct pedestrians to crosswalks
 - Installing colorized pavement within crosswalks
 - Installing illuminated pedestrian crossing signs
 - Installing “countdown” pedestrian signals

PROGRAM DESCRIPTION

Completed Improvements

The Village has recently completed the following improvements:

- **Construction of a Roundabout** - The roundabout is located at the intersection of two streets, immediately adjacent to the Long Island Rail Road Station. A stairway from the train platform terminates at the intersection. The Long Island Rail Road is the busiest commuter railroad in North America, carrying an average of 274,000 customers each weekday; the Great Neck Station is located on one of the railroad’s nine branches. As a result, large clusters of commuters walk across the intersection, particularly in the evening as they disembark from the eastbound platform.

The previous configuration of the intersection, as shown in Figure 1, included a small island in its center, with all-way stop traffic control. These conditions caused confusion among motorists. Pedestrian safety at the intersection was compromised by this unorthodox traffic situation, and excessive lengths of pedestrian crosswalks.



Figure 1 – “Before” construction of the roundabout at Barstow Road

These deficiencies were addressed by the roundabout construction. The roundabout was designed in accordance with Federal Highway Administration standards, and can safely be navigated by commuter buses en route to the train station. The roundabout, constructed in 2003, was the first in New York State to be installed in such a highly-urbanized area.

The completed roundabout, shown in Figure 2, provides well-defined procedures for motorists to travel through the intersection. Clearly-identified pedestrian crossings were provided on the approaches to the roundabout. Contrasting pavement color was used on the pavement within the crosswalk area. To direct pedestrians to these crossings, decorative fencing was installed. Brick sidewalk areas were expanded, which allowed overall pedestrian crossing distances to be shorter. In addition, the “splitter” islands created medians on the roundabout approaches, minimizing the exposure of pedestrians to traffic by enabling them to cross one direction of travel at a time. Appropriate traffic signs and pavement markings were installed at the crosswalks. Handicapped sidewalk ramps adhere to the latest ADA requirements for scored surfaces.



Figure 2 – “After” construction of the roundabout at Barstow Road
The Village’s Public Outreach efforts for this improvement included the posting on its website of NYSDOT’s “step-by-step” brochure of instructions for motorists and pedestrians to proceed through the roundabout.

- ***Installation of Speed Awareness Devices*** - These permanent devices were installed on the four main roads that provide access to the Village’s Central Business District, as the second phase of the first LSSTC grant which constructed the modern roundabout. The devices consist of a radar gun and a digital readout sign displaying the actual speed of approaching vehicles. A speed limit sign is installed next to the digital readout to inform motorists of their speed in relation to the speed limit. Figure 3 shows one of these installations.



Figure 3 – One of the speed awareness devices

- ***Installation of illuminated pedestrian crossing signs*** - These devices consist of overhead warning signs alerting motorists to the presence of pedestrians entering, or in, a crosswalk. The devices, originally constructed as “passively” activated by pressure-sensitive tiles (which meet ADA requirements) installed in sidewalk handicap ramps, were later converted to constantly flashing display to better illuminate the warning signs and to avoid the necessity of having to activate them. The bright, LED pedestrian symbol on the sign illuminates to remind motorists to be aware of pedestrians that might be crossing the roadway. The three crossing locations where these devices are installed include two at the Great Neck railroad station (on North and South Station Plazas) and to the numerous public transit routes serving it, which are heavily used by pedestrians seeking access to the station, and one at a crossing to a heavily utilized park (on Grace Avenue).

The Village completed in the fall of 2008 a traffic calming project, consisting of a “road diet” along a half-mile long section of Great Neck Road, one of the main roadways providing access to its commercial and transportation center. Located along this roadway are a park frequented by parents with infants and young children, as well as a senior assisted living facility, located opposite a busy community shopping center. Elderly residents from this facility cross Great Neck Road on a daily basis to access the shopping center’s stores.

The roadway was constructed in the 1920’s and had not been improved since that time. The pavement is composed of concrete, and Great Neck Road is the only such roadway in the entire CBD area of the Great Neck Peninsula. The pavement surface has become smooth, as the aggregates within the pavement have become “polished” after withstanding 80 years of traffic loading. As a result, the skid resistance of the pavement has become poor, and the Village is very concerned with

the ability of motorists to stop their vehicles safely, particularly at critical pedestrian crossing locations, such as the park and the assisted living facility.

Over the years, sections of the four-foot wide raised median, which was part of the original construction, have been removed to allow access to commercial driveways along the roadway. The result has been that there are numerous opportunities for vehicles to make left and U-turns. This has resulted in stopped vehicles blocking through traffic, as drivers wait for gaps in oncoming traffic to make these turns. Portions of the roadway median previously contained overhead lighting, which posed as a tremendous safety concern in vehicular accidents where these light poles came down on vehicles and started car fires.

The Public Outreach portion of the project entailed several years of community meetings and hearings, from May 2004 to September 2007 in order to gain consensus on the “road diet” concept. Under the completed plan, one lane in each direction of travel was removed, a consistent, landscaped median was re-established, and the roadway was resurfaced with a new, asphalt to increase skid-resistance. Left turn lanes were provided at intersections. At crosswalk locations, sidewalk “bulb-outs” were provided where feasible, and high-visibility crosswalk markings and warning signs were installed. A safety zone was established between the travel lane and parked vehicles, to improve safety for drivers entering and exiting their vehicles.

A “Before” and “After” comparison appears in Figures 4 and 5.



Figure 4 – “Before” road diet construction on Great Neck Road



Figure 5 – “After” road diet construction on Great Neck Road

At the signalized intersection adjacent to the assisted living facility, the existing “WALK/DON’T WALK” pedestrian signals have been replaced with the new, “Man/Hand” symbol signals with a “Countdown” signal display. The improvements have created safer crossings, particularly for seniors.

Improvements Under Preliminary and Final Design

The Village recently completed preliminary and final design of bulb-outs on Bond Street, a typical north-south village street within the business district of Great Neck Plaza. Bond Street generates a great deal of pedestrian activity due to the amount of restaurants and small shops located on it. One of the problems with Bond Street particularly is the section that is located between Railroad Avenue & Grace Avenue. This section of Bond Street is located adjacent to the Great Neck railroad station and it receives a large amount of vehicular traffic from commuters of the railroad. Bond Street has one lane in each direction of travel with parking stalls that have high turnover. Curb and sidewalk on exist on both sides of Bond Street. Due to the 40 foot width of the roadway, the traffic volume it receives and the speed of the motorists during PM commuter peak hours, it can be a challenge to cross Bond Street, especially for the elderly. Additionally, pedestrians crossing Bond Street at the marked crosswalks along both sides of the project limits are obscured from the motorists sight by vehicles parked right up to the crosswalk.

The installation bulb-outs on both sides and ends of Bond Street would serve to slow vehicles entering the roadway from both directions of travel as well as to provide a shorter, more conspicuous and safer crossing distance for pedestrians. Where both bulb-outs are constructed, overhead architectural sign structures would be installed providing additional warning to motorists that they are entering a gateway to a high pedestrian activity location. It can be expected that the constriction of the pavement area by means of bulb-outs will reduce 85th percentile speeds by approximately 10%. This measure will also help to improve the aesthetics of the area as well as to serve to increase

awareness of motorists driving through this segment of roadway. A photo-rendering of the existing conditions and proposed solution are shown in Figures 6 and 7.



Figure 6 – Existing Bond Street conditions



Figure 7 – Proposed Bond Street solution

Additionally, the Village has just started preliminary design for two other grants: a roadway channelization and traffic calming and pedestrian improvements for Barstow Road/North Station Plaza and Linden Place, and a Transportation Enhancement Grant for Middle Neck Road pedestrian and bicyclist improvements in the vicinity of the Great Neck train station. Final design and project letting is expected in the fall of 2009 for both of these projects.

PROJECT SPONSORS (in addition to the Village of Great Neck Plaza) are as follows:

- **New York State Department of Transportation** - Primary funding for the completed improvements, as well as those under preliminary design, was provided by the New York State Department of Transportation under its innovative Local Safe Streets and Traffic Calming Program. The program, which is unique to NYSDOT's Long Island Region, enables the State to fund 80 to 90% of the total cost. With respect to the completed improvements, construction bids for the work resulted in the grant amount being exceeded. The Village demonstrated its commitment to improving safety for its pedestrians by "making up the difference" and providing funding to complete all of the work.
- **Nassau County Department of Public Works** - The Speed Awareness Signs, and some of the Illuminated Pedestrian Crossing Signs, were installed on roadways within the geographic limits of the Village which are maintained by Nassau County. The County reviewed and approved the plans for these devices. Great Neck Road, the subject of the most recently completed "road diet" is also a County-maintained Road.
- **Other Municipalities** - On the Great Neck Road project, a portion of the roadway leaves the Village and extends into the **Town of North Hempstead**. In addition, the **Villages of Russell Gardens, Great Neck Estates and Kensington** are located in close proximity to the project. These municipalities provided extensive input at public meetings and work sessions during the multi-year Public Outreach phase of the project.

PROJECT BUDGET AND DURATION

Project Budgets (includes Design, Inspection and Construction)

Completed Improvements:

- Roundabout (fall, 2003)--\$365,000
- Overhead Speed Awareness and Illuminated Pedestrian
- Crossing Signs (February, 2004)--\$275,000
- Great Neck Road rehabilitation, including a road diet, reconstructed median and enhanced pedestrians crosswalks--\$1,191,000

Improvements Under Preliminary & Final Design

- LSSTC for bulb-outs on Bond Street--\$56,250
- LSSTC for (Barstow Road/Linden Place)--\$280,000
- Transportation Enhancement Program Grant for Middle Neck Road pedestrian and bicyclists enhancements at the LIRR train station-\$725,000

Project Duration

- **Completed Improvements** - Design work began on the Barstow Road roundabout in 2002. Construction of the roundabout was completed in October 2003. Construction of the Speed Awareness and Illuminated Pedestrian Crossing Signs were completed in February 2004. Design commenced on Great Neck Road in the fall of 2004 and construction was completed in fall of 2008.
- **Improvements Under Preliminary & Final Design** - Design work began in 2007 on the Bond Street bulb-out project. It was bid twice in 2008 and was not awarded due to high bids and the lack of monies in the grant to award the lowest bid. The project will be re-bid in 2009 and construction is expected to be completed by October, 2009.

ACKNOWLEDGMENTS

The Village of Great Neck Plaza acknowledges the assistance provided by the New York State Department of Transportation (NYSDOT), Region 10, through its Local Safe Streets and Traffic Calming grants, which assists local governments in making their roadways safer for pedestrians and bicyclists. Launched and administered by the NYSDOT, this unique program is federally funded. NYSDOT developed the Local Safe Streets and Traffic Calming Pilot Program based on suggestions from public officials, the Long Island Transportation Plan 2000 Subcommittee on Bicycle, Pedestrian and Special Travel, Town of Brookhaven, Village of Sag Harbor, Paumonok Bicycle Advocacy, Longwood Alliance, Group for the South Fork, the Tri-State Transportation Campaign, and various community representatives. In 1995, the NYSDOT adopted a policy to include bicycle and pedestrian-related projects in the overall intermodal transportation system. In addition, NYSDOT's Long Island regional staff routinely provides pedestrian accommodations in its arterial highway rehabilitation and reconstruction projects. The Safe Streets Program is an example of how NYSDOT is addressing the transportation needs of all stakeholders to help provide a safe, efficient

transportation system throughout the region. Providing grants to local governments helps improve pedestrian and bicycling safety on Long Island's neighborhood streets by implementing appropriate safety projects or traffic calming measures. Without these funds, the high cost of roadway rehabilitation and safety improvements would be prohibitively expensive for a small municipality such as the Village of Great Neck Plaza. Special thanks to Wayne Ugolik, Dave Glass, Lanny Wexler, Brian Kralj, Andrew Papazian, and Jean Cai who have played significant roles in the LSSTC program and these LSSTC projects for Great Neck Plaza.

REFERENCES

Following are some general background materials and resources for information on modern roundabouts. The Mayor and Board of Trustees felt that this may be helpful to you in understanding the reconstructed roundabout at South Station Plaza and Barstow Road.

1. General Roundabout Design Principles:

The following are the basic principles of roundabout design with respect to vehicle movements, crosswalk locations, pedestrian conflicts, and design geometry.

A roundabout reduces the number of conflict points between vehicles and also between pedestrians and vehicles. The basic operation of the modern roundabout is to give the right-of-way to vehicles that are in the circulating roadway. All approaching vehicles must yield before turning right and proceeding into the circulating roadway, and all exiting turns are right-turn movements. Therefore, roundabouts eliminate dangerous left-turning vehicular movements which reduce conflicts and increase safety over a conventional intersection design. Through the design of the intersection geometry and utilizing traffic calming philosophy, vehicle speeds are greatly reduced when roundabouts replace stop sign or traffic signal controlled intersections. Pedestrians are directed to cross roundabouts on the approaches with well-marked crosswalks located at least one design vehicle-length away from the circulating roadway. This design treatment allows for the lead vehicle to watch for gaps in traffic circulating in the roundabout while pedestrians cross behind the lead vehicle. It also allows an exiting vehicle to stop prior to the crosswalk in a potential conflicting pedestrian event while still remaining clear in the rear of the vehicles traveling in the circular roadway. Another design enhancement is the use of refuge areas that are located in the approach splitter islands that reduce the amount of time pedestrians are in the travel lane during crossing.

2. Below is a list of locations in the US with urban roundabouts:

- a. Towson MD
- b. Fort Pierce, FL
- c. East Lansing, MI
- d. South Portland, ME
- e. Lake Worth, FL at end of the Downtown
- f. Clearwater Beach, FL
- g. Augusta, GA

Source:
Michael J. Wallwork, P.E.
President
Alternate Street Design, P.A.
1516 Plainfield Avenue
Orange Park, FL 32073
Telephone (904) 269-1851
Fax (904) 278-4996

Check out these web sites for more information at:
<http://www.roundabouts.net>

<http://www.roundaboutsusa.com>

3. Other Web Sites and Articles Regarding Roundabouts:

a. Excellent articles about roundabout safety and efficiency can be found at:
<http://www.roundabouts.com>

<http://www.tfhrc.gov/safety>

b. A good article that reinforces the idea of the removal of stop signs or signals at intersections and utilizing roundabouts with YIELD control can be found at:

<http://www.sdearthtimes.com/et0501/et0501s12.html>

c. The following article talks about roundabout safety and the reduction of accidents up to 75% after the removal of the existing stop sign or traffic signal that had controlled the intersection movements.

<http://www.hwysafety.org/srpdfs/sr3607.pdf>

4. Other Web Sites and Articles Regarding Road Diets:

a. Excellent articles about road diets can be found at:

Burden, D. and P. Lagerwey. *Road Diets: Fixing the Big Roads*
<http://www.walkable.org/download/rdiets.pdf>.

FHWA Summary Report, *Evaluation of Lane Reduction "Road Diet" Measures and Their Effects on Crashes and Injuries*
<http://www.tfhrc.gov/safety/hsis/pubs/04082/04082.pdf>

Authors Information:

Jean A. Celender
Mayor
Village of Great Neck Plaza
P.O. Box 440
Great Neck, NY 11022-0440
Phone (516) 482-4500, ext. 114
Fax (516) 482-3503
Email: mayorjean@greatneckplaza.net

Albert T. Dawson, P.E.
Vice President
L.K. McLean Associates, P.C.
437 South Country Road
Brookhaven, NY 11719
Phone (631) 286-8668
Fax (631) 286-614
Email: adawson@lkma.com

Raymond G. DiBiase, PE, PTOE™
Executive Vice President
L.K. McLean Associates, P.C.
437 South Country Road
Brookhaven, NY 11719
Phone (631) 286-8668
Fax (631) 286-614
Email: rdibiase@lkma.com