WEST WINDSOR BICYCLE AND PEDESTRIAN ALLIANCE

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January 5, 2010

To: West Windsor Township Mayor Shing-Fu Hsueh; Mercer County Executive Brian Hughes; Mercer County Engineer Greg Sandusky; Mercer County Traffic Engineer George Fallat; John Kovar, Project Manager, Louis Berger Group; Patricia Ward, Coordinator, Community Development, West Windsor Township; Brian Aronson, Assistant Manager of Engineering, West Windsor Township; Francis Guzick, Township Engineer, West Windsor

Cc: West Windsor Township Council Members; West Windsor Township Planning Board Members; Mercer County Board of Freeholders; U.S. Representative Rush Holt; New Jersey State Senator Bill Baroni; New Jersey State Assemblywoman Linda Greenstein; New Jersey State Assemblyman Wayne O. DeAngelo; Robert Hary, West Windsor Township Business Administrator; Aaron Watson, Director, Mercer County Transportation and Infrastructure

Re: Main Street Princeton Junction / Rt. 571 Design Recommendations

Introduction

West Windsor Bicycle and Pedestrian Alliance (WWBPA) is pleased to see progress toward making our township more bicycle and pedestrian friendly, as evidenced by the public hearing December 15, 2009 on the planned improvements to the Main Street Princeton Junction area.

This letter documents our recommendations, building on previous communication, including letters to the Mayor, Township Council et al., in 2006, 2007 and 2009, a community walk in 2007 and an intersection walkability evaluation in 2008, as detailed on our Web site. County, state and federal officials are included in this communication because this county project is reportedly seeking state and federal funding.

Executive Summary

The Redevelopment Plan notes the project area is near “New Jersey Transit’s highest volume commuter rail station along the Northeast Corridor and at the heart of West Windsor Township”, and reflects the township’s historic agreement to “create a “Main Street” … that would transform the existing strip commercial form of development along Route 571 … to achieve a desirable mix of pedestrian-friendly, village scale development.”[i] These improvements to the roadway and streetscape are critical to realizing our plan.

The WWBPA is pleased to see continuous sidewalks planned for both sides of the roadway, and trust they will be implemented so as to bring the project area into compliance with Americans with Disabilities Act (ADA) standards.

Differing visions, resulting from Rt. 571's dual role as arterial and "Main Street," have delayed much-needed improvements, resulting in a reported vehicle collision rate 50% above state averages. Bicycle and pedestrian collision rates were not reported.

Fortunately, NJDOT guidelines to resolve these kinds of differences are included in the NJDOT Smart Transportation Guidebook (STG)[ii] published March, 2008. In addition, since the hearing NJDOT adopted a "Complete Streets" policy which will ensure that all users are accommodated on our state highway system.[iii]

Unfortunately, the state guidelines were not considered when developing the Rt. 571 design. Critically, the usage context of the roadway was not considered – using STG language, Rt. 571 is a Suburban Center, and the Township Master Plan envisions it a Town Center, as new buildings close to the street are developed over time.

This context is critical because it drives the choice of design features that work together to impact safety, e.g.:

1. Desired vehicle operating speed.
2. Two-way left turn lanes (TWLTL's) vs. curbed medians.
3. Midblock pedestrian crossings.
4. Bike lanes.
5. Intersection width.
6. Transitions and gateways to the main street area.

Based on the information below, the WWBPA recommends:

1. Lower desired operating speed to 25-30mph, supported by each roadway design element, not just a lower posted speed.
2. Curbed medians with appropriate pedestrian refuges.
3. Pedestrian-activated crossing signal that stops traffic at Sherbrooke.
4. Bike lanes per the Township Master Plan.
5. Increased safety at intersections through a variety of design changes, e.g.:
    a. pedestrian-only crossing time as part of the signalization of intersections.
    b. adopt NJDOT-recommended geometry of curb radius and right turn slip lane islands.
    c. allow sufficient crossing time to comply with ADA standards.
    d. provide pedestrian refuges in medians when crossing distance exceeds 60 feet, per NJDOT policy, or keep distance under 60 ft.
    e. eliminate right-turn-on-red permission at the Wallace/Cranbury and Clarksville intersections with Rt. 571.
6. Strengthen visual cues leading to and within the main street area, e.g.:
    a. reduce the posted speed limit in the transition areas leading to the main street to 35mph.
    b. reduce to one through-travel lane before the start of the area.
    c. provide gateway treatments defining the area boundaries.
    d. provide street furniture, trees and landscaping.

Cost can be reduced by staying within current right-of-way boundaries, implementing raised-curb medians instead of TWLTL's and eliminating roadway and intersection widening.

The WWBPA is confident that implementing these recommendations will reduce cost, increase safety for all roadway users and greatly increase the livability and desirability of the township.

Vehicle Operating Speed

The current desired operating speed is simply not pedestrian friendly. State guidelines call for a desired operating speed of 25-30mph,[iv] versus 40mph in the current design. If a pedestrian is hit by a vehicle traveling at 40mph, he/she has a 15% chance of survival, but if the vehicle is going 30mph, chance of survival increases to 55%[v]. In addition, "Faster speeds increase the likelihood of a pedestrian being hit."[vi] Last, motorist compliance with yielding to pedestrians in crosswalks is significantly improved by reducing vehicle speed to below 35mph.[vii]

The WWBPA urges reconsideration of the desired operating speed in the strongest terms possible.

Lowering the desired operating speed must not be just changing the speed limit sign, however. Each design element, including roadside features as well as features not directly related to design speed, should support the desired operating speed.[viii] This "livable streets" approach has been shown to greatly improve safety for motorists, pedestrians and bicyclists.[ix]

Two-way Left Turn Lanes (TWLTL's) vs. Medians

The WWBPA is concerned about the proposed TWLTL's, because the design:

1. Reduces pedestrian safety by half.[x] NJDOT notes "the raised median with curbing is preferred due to its ability to encourage safe pedestrian crossings".[xi]
2. Costs more to build (10-15%) and maintain (40%), vs. medians.[xii]
3. Is appropriate for roadways with low to moderate speeds and volume.[xiii]
4. Has only a "negligible" effect on motorist safety compared to the existing roadway, since there is no on-street parking.[xiv]
5. Appears utilitarian, compared with medians, which can be attractively landscaped.

The WWBPA strongly recommends the consideration of medians with appropriate pedestrian crossing refuges and left turn lane cutouts at driveways.

Midblock Crossings

Pedestrians are observed to cross at midblock[xv] because the distance between signals at Cranbury/Wallace and Alexander, about 1965 feet, exceeds NJDOT guidelines of

1320 feet.[xvi] Additional signals and/or midblock crossings should be provided. If TWLTL's are implemented, crossing design is even more critical, due to the extra lane. NJDOT notes:

> "There is no difference in safety between marked and unmarked midblock crosswalks on two-lane roads, and that marked midblock crossings on multi-lane roadways are actually less safe than unmarked midblock crossings."[xvii]

The WWBPA recommends a pedestrian-activated signal that stops traffic, called a HAWK Signal Beacon[xviii] or Pedestrian Hybrid Beacon, at the crossing at Sherbrooke Drive, meeting Community Arterial guidelines,[xix] as well as the new 2009 Manual of Uniform Traffic Control Devices (MUTCD) guidelines.[xx]

Bike Lanes

Bike lanes are missing in the design, yet they are an important traffic calming and bicyclist safety feature. Their absence is particularly puzzling since they are included in the Township Master Plan as well as in earlier concept drawings.

The WWBPA strongly recommends the provision of bike lanes to encourage bicycling for casual and child bicyclists.[xxi]

Intersection Safety

The WWBPA is concerned that current plans to expand the intersections in the project area meet capacity improvement goals but not safety goals, because:

1. Wider intersections lead to additional pedestrian collisions and greater motorist frustration, due to longer crossing times.
2. Proposed curb radius is too long (i.e., the turns are not sharp enough), which encourages drivers to make faster turns and provides less time to watch for pedestrians and bicyclists.[xxii]
3. At some intersections, a right turn slip lane island is proposed which does not follow the design geometry recommended by NJDOT,[xxiii] making it difficult for drivers to look both left for oncoming traffic and right for pedestrians in the crosswalk.

The WWBPA recommends a range of solutions, including:

1. Pedestrian-privileged crossing time as part of the intersection signalization, such as pedestrian-only crossing time, which must be sufficient to comply with ADA standards.
2. Adopt the NJDOT-recommended geometry of curb radius and pedestrian island geometry for right turn slip lanes.
3. Limit pedestrian crossing distance to 60 feet, or provide a median with a pedestrian refuge area whenever the distance exceeds 60 feet, per NJDOT policy.[xxiv]
4. At Clarksville, special consideration is strongly recommended to maintain the safety of children walking to the high school, as well as the safety of the crossing guard, by not including new right turn slip lanes, which encourage drivers to bypass the crossing guard's instructions to stop.

5. Eliminate right-turn-on-red permission at the Wallace/Cranbury and Clarksville intersections with Rt. 571

Visual Cues Defining Main Street

To function effectively as a pedestrian-friendly Main Street, the design should provide visual cues to drivers, including transition zones, reduced speed, bike lanes, gateway treatments, street furniture and trees and other landscaping.[xxv]

The WWBPA recommends:

1. Transition from 2 to 1 eastbound travel lanes before the Cranbury/Wallace intersection, by using the existing left lane as a left turn only lane.
2. Reduce travel speed eastbound to 35mph starting on the approach to the Station Drive intersection
3. Transition from 2 to 1 westbound travel lanes before the Clarksville intersection, by using the existing left lane as a left turn only lane.
4. Reduce travel speed westbound to 35mph starting at the South Mill intersection.
5. Bike lanes and/or a multi-use path (such as bordering the Rogers Arboretum and/or the high school) per the Township Master Plan.
6. Gateway treatments with landscaping, signage, medians and decorative pavement at the Cranbury/Wallace and Clarksville intersections.
7. Street furniture and lighting per the Township Master Plan.

The WWBPA is concerned that the design does not reflect current state policies and guidelines that balance capacity, safety and usability for motorists, bicyclists and pedestrians. We believe implementing these recommendations is critical to achieve this balance, and look forward to working with our public officials to make West Windsor a more bicycle and pedestrian friendly community.

Respectfully submitted on behalf of the Trustees of the WWBPA,

Jerry Foster
2nd Vice President
West Windsor Bicycle and Pedestrian Alliance

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[i] Township of West Windsor Redevelopment Plan for Princeton Junction, adopted March 23, 2009 http://westwindsornj.org/redevelopment/2009/20090323ADOPTEDVERSIONREDEVPLAN.pdf

[ii] http://www.state.nj.us/transportation/community/mobility/pdf/smarttransportationguidebook2008.pdf

[iii] http://blog.bicyclecoalition.org/2009/12/new-jersey-issues-complete-streets.html

[iv] NJ DOT Smart Transportation Guidebook, p.37

[v] Federal Highway Administration (2002). Pedestrian Facilities Users Guide: Providing Safety and Mobility. Available at: http://drusilla.hsrc.unc.edu/cms/downloads/PedFacility_UserGuide2002.pdf

[vi] U.S. Department of Transportation Federal Highway Administration and Pedestrian and Bicycle Information Center within the University of North Carolina Highway Safety Research Center. http://www.walkinginfo.org/pedsafe/crashstats.cfm

[vii] "Figure 26 shows motorist yielding by treatment type and speed limit. … Figure 26 shows a clear break between two groups of treatments at the 35-mph (55-km/h) speed limit. The most effective treatments are all red signal or beacon devices. On a 35-mph (55-km/h) roadway, the best compliance rate observed for a

treatment not showing a red indication to the motorist is about 63 percent. Compliance rates go as low as 8 percent for the 35-mph (55-km/h) speed limit group. For the 25-mph (40-km/h) speed limit roadways, all the devices have a high compliance (greater than 60 percent)."
Transit Cooperative Research Program and National Cooperative Highway Research Program, TCRP REPORT 112/NCHRP REPORT 562, Improving Pedestrian Safety at Unsignalized Crossings
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf

[viii] "In the interest of highway safety, it is desirable to have a stronger relationship between the posted speed limit, design speed, and operating speed.13 Therefore, this guidebook recommends that the desired operating speed for most roadway types be the same as the design speed, and also the same as the posted speed. Under this policy, all of the controlling design elements directly related to design speed – horizontal curvature, gradient, superelevation, and stopping sight distance – would be set equal to, and therefore reinforce, the desired operating speed. Roadway features not directly related to design speed, such as lane and shoulder width, and the presence or absence or a parking lane, should also support the desired operating speed. Roadside design features, such as the building setback or use of street trees, should likewise support the desired speed." Smart Transportation Guidebook, p. 42

[ix] "Dumbaugh (2005) examined this concept in his study of an arterial highway in Orlando, Florida. Comparing two approximately 1-mile segments of an arterial highway having the same right-of-way width but different cross-sectional configurations, he found that the section that had been designed to be "livable" was safer in every respect than the comparison section (see Table 5 for the design characteristics). During a five-year evaluation period, the livable section had fewer vehicular collisions of every kind and far fewer pedestrian and bicyclist injuries and fatalities. While six midblock fatalities occurred on the comparison section, including three that involved pedestrians, none occurred on the livable section."
The Effects of Transportation Corridors' Roadside Design Features on User Behavior and Safety, and Their Contributions to Health, Environmental Quality, and Community Economic Vitality: a Literature Review
http://www.escholarship.org/uc/item/12047015

[x] "In suburban areas, the (pedestrian crash) rate was 6.31 per 100 million miles for raised median, versus 12.89 for TWLTL and 13.91 for undivided roadways." NJDOT Smart Transportation Guide, p. 54, citing Bowman, B.L. and R.L. Vecellio. "Effect of Urban and Suburban Median Types on Both Vehicular and Pedestrian Safety." Transportation Research Record 1445, Transportation Research Board, National Research Council, Washington, D.C., 1994, pp. 169-179.
And "The advantage in pedestrian safety for raised medians has been found in other studies." citing Zegeer, C.V., J.R. Stewart and H. Huang. Safety Effects of Marked vs Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines. FHWA, U.S. Department of Transportation, November 2000.

[xi] NJ DOT Smart Transportation Guidebook, p.54

[xii] Florida Department of Transportation cites a study showing "Medians average a 5-10% reduction in materials and labor costs compared to a TWLTL. While there is only a slight savings in cost to build a raised median versus a TWLTL, there is substantial savings in maintenance. A study … found medians save an average of 40% of maintenance costs based on a 20 year roadway life."
http://www.dot.state.fl.us/Safety/ped_bike/handbooks_and_research/ped12_15.pdf , p.102

[xiii] John Kovar of the Louis Berger Group, the project manager for the Rt 571 improvements, noted in his presentation at the public hearing that the current volume is about 17,000 vehicles per day, with a design speed of 45mph, posted speed of 40mph.
Iowa Department of Transportation notes "The upper limit for using a three lane (TWLTL) design is about 17,000 vehicles per day of traffic." http://www.iowasudas.org/design/Chapter05/5I-5-08.pdf
Florida Department of Transportation "does not employ two-way left turn lanes on multi-lane roadway sections with design speeds greater than 40 mph."
http://www.dot.state.fl.us/research-center/Completed_Proj/Summary_PL/FDOT_BC353_40.pdf
TWLTL's "are suggested for consideration on roadways with volumes from 10,000 to 24,000 vpd.53, 54, ". NJDOT Smart Transportation Guidebook, p. 55, citing 53 McCoy, P., J.L. Ballard, D.S. Eitel, and W.E. Witt. "Two-Way Left-Turn Guidelines for Urban Four-Lane Roadways." Transportation Research Record 1195. Transportation Research Board, National Research Council, Washington, D.C., 1988. and
54 Transportation Research Board, Access Management Manual.

[xiv] National Cooperative Highway Research Program Report 395, Capacity and Operational Effects of Midblock Left-Turn Lanes, p.2
"The undivided cross section has a significantly higher accident frequency than the TWLTL and raised-curb median treatments when parallel parking is allowed on the undivided street. When there is no parking allowed on either street, the difference between the undivided and TWLTL treatments generally is small and negligible for average daily traffic demands of less than 25,000 vpd. In general, the raised-curb median treatment appears to be associated with fewer accidents than the undivided cross section and TWLTL, especially for average daily traffic demands that exceed 20,000 vpd."
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_395.pdf
[xv] "Pedestrians were also observed crossing Hightstown Road north of the Acme Shopping Center and north of the Sunoco Station." West Windsor Bicycle/Pedestrian Plan, 2004, p.24
[xvi] "On lower order suburban roadways, spacing of 660 ft. (1/8 mile) permits safe pedestrian crossings at the upper boundary of desirable block lengths. Signal spacing of 1320 ft. (1/4 mile) begins to permit the speed progression sought by NJDOT or PennDOT on those corridors where traffic flow is a priority. On higher-order roadways where major pedestrian generators straddle the corridor, the best choice is sometimes smaller signal spacing and acceptance of a lower progression speed." NJDOT Smart Transportation Guidebook, p. 34
[xvii] NJ DOT Smart Transportation Guidebook, p. 64
[xviii] HAWK beacons are signals that stop traffic when activated by a pedestrian or bicyclist. See the Tucson, AZ engineering description on the Safe Routes To School Web site: http://www.saferoutesinfo.org/guide/case_studies/case_study.cfm?CS_ID=CS651&CHAPTER_ID=C353 , and a Portland, OR video describing it's operation: http://www.youtube.com/watch?v=uHihP2t5mdQ
[xix] "Community Arterial. On multi-lane roadways, a raised median and advanced yield markings are desirable. Accompanying lights are recommended for two-lane roadways of 35 mph or above, as well as multi-lane roadways." Smart Transportation Guidebook, p. 65
[xx] http://mutcd.fhwa.dot.gov/kno_2009.htm
[xxi] "Bike lanes are the ideal facility for accommodating basic bicyclists. By designating a space only for bicyclists, they give bicyclists a measure of comfort that motorists will not move into their path. They serve to advise motorists of the possible presence of bicyclists." NJ DOT Smart Transportation Guidebook, p. 50
[xxii] In "town center contexts, where pedestrian activity is often intense, the smallest possible curb radii should be used. As indicated in the AASHTO Green Book, a curb return radius of 10 to 15 feet is used at most urban intersections, partly to minimize pedestrian crossing distances." Smart Transportation Guidebook, p. 57
[xxiii] NJDOT Smart Transportation Guidebook, p. 58
[xxiv] NJDOT Pedestrian Compatible Planning and Design Guidelines, p. 28
[xxv] NJDOT Smart Transportation Guidebook, p. 44