City of Bloomington

401 N Morton St
Bloomington, IN 47402
812-349-3417
www.bloomington.in.gov

NEIGHBORHOOD TRAFFIC SAFETY PROGRAM
PROSPECT HILL NEIGHBORHOOD
WEST THIRD STREET
ENGINEERING REPORT

ENGINEERING DEPARTMENT

Contents

Contents	3
Abstract	4
Assesment	5
History	6
Process	7
Design Consideration	11
Remaining Processes	20
Recommendations	21
Appendices	22

List of Figures

Figure 1, Types of traffic calming.	12
Figure 2A, Percent of Vehicles by speed	13
Figure 2B, Traffic Counts, Rogers to Fairview	13
Figure 2C, Traffic Counts, Fairview to Davison	14
Figure 3, Comparison of 85th percentile.	15
Figure 4, Traffic Counts, How and 4th St	17
Figure 5, Traffic Counts, Kirkwood and 2nd	17
Figure 6, Ballot area.	18
Figure 7, 10 year accident history.	20
Appendix A, BPW Resolution 2004-28	23
Appendix B, Participation Application	26
Appendix C, BPSC Minutes 12/14/09	27
Appendix D, BPSC Minutes 05/17/2010	28
Appendix E, Speed cushion white paper.	29
Appendix F, Area Map	30
Appendix G, BPSC agenda 07/19/2010	31
Appendix H, Proposed Streetscape, South Rogers	32
Appendix I, Traffic Calming Ballot	33
Appendix J, Neighborhood Traffic Safety Program	34

Abstract

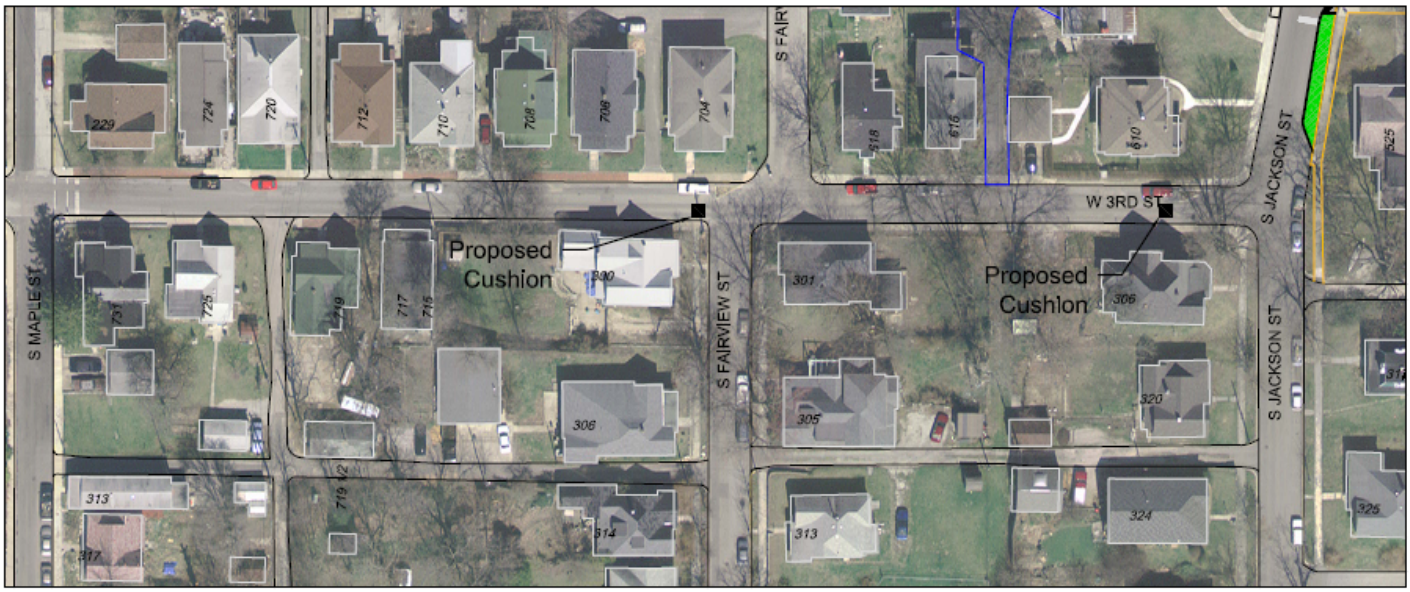
In 2002 the City of Bloomington Engineering Department received an application for participation in the Neighborhood Traffic Safety Program (NTSP) from the residents of the Prospect Hill Neighborhood. The principle street of interest was West 3rd Street from South Rogers Street to South Walker Street. Speeds and volume in the area had given the residents along West 3rd Street some concern and the completed NTSP process resulted in the installation of two forms of traffic calming along West 3rd Street. An Engineering Study and the installation of chicanes and staggered parking resulted in reducing the speeds and volumes along West 3rd Street to typical values as compared to other residential streets with similar classifications.

In 2009 the City has received a second application for participation from the Neighborhood to further reduce the speeds and volumes along West 3rd Street. City Engineering has reviewed the application and has collected data relative to the petition. In its review, City Engineering has found that the 85th percentile speed remains less than 30 mph and volumes have remained relatively unchanged from the 2003 installation to the initial 2009 traffic counts.

Following the Bicycle Pedestrian and Safety Commission recommendations and the input from two public meetings, it was determined that speed cushions and a bump-out along Jackson would be tested. A ballot of the project street was conducted by the City and indicated the necessary public support to continue into testing of the new proposal. Due to negative feedback and data that indicated no change in traffic patterns, the bump-out along South Jackson Street was removed and the positions of the speed cushions were adjusted.

City Engineering has studied the effects of the new configuration on neighborhood speeds, traffic volumes, vehicle classification, diverted traffic patterns, emergency services and accident history and has determined that the positive aspects of the new configuration do not out weigh the negative aspects.

Therefore, City Staff recommends that the street be returned to its initial 2004 configuration until the effects of the improvements at West 3rd Street and South Rogers Road are completed. The Rogers Street project has taken into consideration the neighborhood concerns with the addition of new lane configurations and Prospect Hill entrance that should contribute in a positive way to the neighborhood. Furthermore, improvements to both West Kirkwood Avenue and West 2nd Street should mitigate the negative effects of both speeds and volumes.



600 and 700 Block West 3rd Street, Between Jackson St and Maple St.

800 and 900 Block West 3rd St, Between Maple St and Buckner St.

Assessment

Over the course of the past several years, some residents In the Prospect Hill Neighborhood have requested to participate in the Cities Neighborhood Traffic Safety Program (NTSP). This assessment will focus on the installed traffic control devices and the current request for additional controls on West 3rd Street. The project area is defined as West 3rd Street from South Rogers Road to South Walker Street. It consists of one one-way street with parking on one side and a posted speed limit of 25 mph. The street is classified by the Master Thoroughfare Plan as a residential street with a signalized intersection to the East onto a primary arterial. In 2003 chicanes were installed and parking staggered as the result of a previous NTSP request. In 2009 the Neighborhood has again requested additional controls to be installed in order to reduce speeds and discourage cut-through traffic.

History

1983-1984 - CDBG to widen Jackson for improved drainage.

08/10/1994 - Application for traffic calming from Bill Sturbaum. Requested a neck down at 3rd and Rogers.

10/15/2001 - Traffic counts.

07/11/2001 - Traffic counts.

05/24/2002 - NTSP application submitted and endorsed by Council member Patricia Cole.

07/19/2002 - BPSC votes in favor of advancing the petition.

09/09/2002- Presentation at neighborhood meeting.

10/15/2002 - Public meeting with 19 residents.

April - May 2003 – Neighborhood ballot indicates 61.4% of returned ballots are in favor of Chicanes.

08/06/2003 - Ordinance 03-18 – City Council passes NTSP Chicanes.

Prior to taking action on Ord 3-18, Patricia Cole offered Amendment #1:
which authorized the installation of traffic calming devices two blocks further east than originally proposed in the ordinance (to Jackson) without requiring a second balloting of the directly affected households.

Mike Diekhoff, Andy Ruff, Tony Pizzo, Chris Gaal, Dave Rollo, Patricia Cole, David Sabbagh, Tim Mayer all voted Aye.

Jason Banach was not in the room during the vote

Ord 3-18 as amended was passed on August 6, 2003 8-0

Mike Diekhoff, Andy Ruff, Tony Pizzo, Chris Gaal, Dave Rollo, Patricia Cole, David Sabbagh, Tim Mayer all voted Aye.

Jason Banach was absent --

Fall 2003 – Parking on W 3rd Street is shifted to current staggered configuration.

11/17/2003 – Installation of Chicanes on W 3rd Street. $10,120.00.

06/30/2004 - BPW Resolution 2004-28, Traffic calming and Neighborhood Association maintains plantings in islands. See Appendix

06/21/2004 – Installation of bump outs next to staggered parking, $4,790.00.

08/03/2004 - $1,728.10 landscaping for W 3rd St.

11/15/2004 - Traffic counts.

05/14/2009 – Petition, neighborhood request to Police Department for increased monitoring.

07/06/2009 - Traffic counts.

11/05/2009 - NTSP application submitted and endorsed by Council member Chris Sturbaum. See Appendix.

Fall 2009 - Traffic counts.

12/14/2009 - BPSC votes 5-0-0 in favor of vindicating the petition.

01/25/2010 - Public meeting.

03/02/2010 - Traffic counts.

05/06/2010 - $8,323.49, test cushions for W 3rd St.

07/07/2010 - Traffic counts.

11/18/2010 - Public meeting.

02/14/2011 - Ballots received.

02/18/2011 - Traffic counts.

Install cushions and bump-out.

04/05/2011 - traffic counts.

Remove bump-outs and adjusted cushions to new locations.

06/13/2011 - Traffic Counts.

10/03/2011 – Traffic Counts. Recount for returning IU Students.

02/27/2012 - BPSC.

Process

The Neighborhood Traffic Safety Program (NTSP) offers a mechanism for groups to work with the City to make decisions about how traffic safety techniques might be used to manage traffic in their neighborhood. This section offers a detailed description of the steps involved in participating in the program from the initial application for involvement, to developing a traffic safety plan, to installing one or more traffic calming devices, to a follow-up evaluation of the plan's success.

The NTSP process is intended to ensure that all neighborhood stakeholders are provided the opportunity to be involved. This ensures that consideration of traffic problems on the study street do not result in the exacerbation of traffic problems on adjacent neighborhood streets and does not eclipse the needs and quality of the neighborhood as a whole. This includes a consideration of the impacts of traffic diversion onto collector and arterial streets.

The following is an account of the steps for the 2009 application for traffic calming in the Prospect Hill neighborhood.

Step: 1 – Apply to Participate

The City of Bloomington Engineering Department received a 'participant application' for traffic calming from Karen Knight on behalf of the Prospect Hill Neighborhood on November 5, 2009. The request was sponsored by Councilmember Chris Sturbaum. The application was accompanied by the required signed petition. With a total of 57 homes on the project street, the petition contained 40 signatures or 70.2% of the properties, well above the required 51% participation threshold required to advance the request.

The application provided the following description of the problem;

"We are asking for modification of the traffic problems we are experiencing on W 3rd St from Rogers to Walker. The traffic volume and driver aggressiveness has noticeable increased and we are shocked and disturbed by the change. Our core street has become an inappropriate cut through, a hazard to the public exist."

Furthermore, the application offered the following Suggestions;

"Justin Wyckoff has suggested a traffic island at the beginning of the neighborhood. Neighbors have recommended speed bumps or changing the direction of the road at certain points. We will continue to research other options."

Step: 2 – Engineering Staff Review and Preliminary Data Collection

The City of Bloomington Engineering Department completed traffic counts prior to the receipt of the application from petitioners regarding where they felt problems still existed following the installation of traffic calming in 2001. In early 2009, Engineering was contacted by Karen Knight and Susan Park regarding problems they felt existed with traffic aggression and speeding which resulted in traffic counts to determine the validity of their concern. Traffic counts did not indicate a problem as the 85th percentile speed was less than 30mph (26mph in several locations). These speeds are within typical norms as compared with other City streets of similar classification and volumes.

Step: 3 – Bicycle and Pedestrian Safety Commission Review of Engineering Studies and Petitions

The Bicycle and Pedestrian Safety Commission review of the studies and petition resulted in an approval at their December 14, 2009 meeting. The Engineering Department presented the petition and a summarized update on the traffic calming that has been installed in the preceding years. The summary included the findings of current traffic counts that indicated the Chicanes have reduced the initial higher speeds to normal levels. Karen Knight (petitioner) was present at the meeting and indicated that the drivers have become more aggressive since the installation of the Chicanes. The Commission was unsure if more traffic calming would be effective but voted 5-0-0 to validate the petition and advance it to the next level.

Step: 4 – Public Meeting

Public meetings were held on Monday, January 25, 2010 and November 18, 2010 to discuss the Neighborhood Traffic Safety Program (NTSP). The meeting was advertised by distributing invitations to all the properties within the project area as well as all of the connecting streets. Represented at the January 25th meeting was City Engineering Department, Karen Knight (Petitioner), Chris Sturbaum (Sponsor) and 15 members of the general public. Represented at the November 18th meeting was City Engineering, Karen Knight (petitioner), Chris Sturbaum (Sponsor), Joe Qualters (City Police), and 9 members of the general public. At both meeting City Engineering presented the current findings of the neighborhood study as well as different methods of traffic calming. Some of the methods of traffic calming discussed included a center island at Rogers Street, the planned Rogers Street project, neighborhood signs, 2nd Street expansion and speed tables. Some of the concerns presented by the neighborhood included noise levels, traffic volume and speeds, diverted traffic onto 4th Street and Howe, bicycle issues, Patterson Point development and aggressive driving. The currently installed traffic calming was discussed and the current speeds on West 3rd Street were presented as being within normal levels. Those attending the meeting in favor of the petition appeared determined that City Engineering explores the installation of speed humps onto 3rd Street. City Engineering offered to consider the installation of speed cushions, a modified speed hump that allows larger emergency vehicles to straddle the control without losing speed.

Step: 5 – Preparation of Alternative Designs and Selection of Proposed Plan

This is a difficult step for the Engineering Department because we need to identify a problem before we can solve it. When a neighborhood is convinced they need traffic calming while traffic studies do not indicate a problem, it is difficult to make recommendations for a solution. Our approach was to identify a means of traffic calming that would be least obtrusive to emergency response vehicles (police, fire, ambulance). The neighbors had a general request that they wanted speed humps, which are not

desirable by emergency response personnel. As traffic calming has evolved over the years, a modified speed hump has been successfully used to mitigate some of the problems for emergency personnel. The speed cushion is designed and placed so that larger emergency vehicles (fire trucks, ambulances) can pass over (straddle) the cushion without their wheels touching it. This device along with the placement of curbing on Jackson Street was identified as desirable traffic calming that the neighborhood wanted to see put in place.

Step: 6 – Project Ballot

In February of 2011 Project Ballots were mailed to those eligible for voting according to the Neighborhood Traffic Safety Program. These included residents along the project street that must use the street as their primary access (fig 4). The results were 74.36% of balloted residents in favor of the traffic calming.

Step: 7 – Testing and Evaluation of Traffic Calming Device(s)

In order to determine the effect of the traffic calming a testing and evaluation period began in early March of 2011. Shortly after the testing and evaluation began, we were contacted by neighbors at issue with the location of the speed cushions in several locations, and additionally with the placement of curbing along Jackson Street. Our intention was to allow a minimum of 30 days for traffic to become accustomed to the changes, and then perform traffic counts to provide for improved accuracy of the result of the traffic calming.

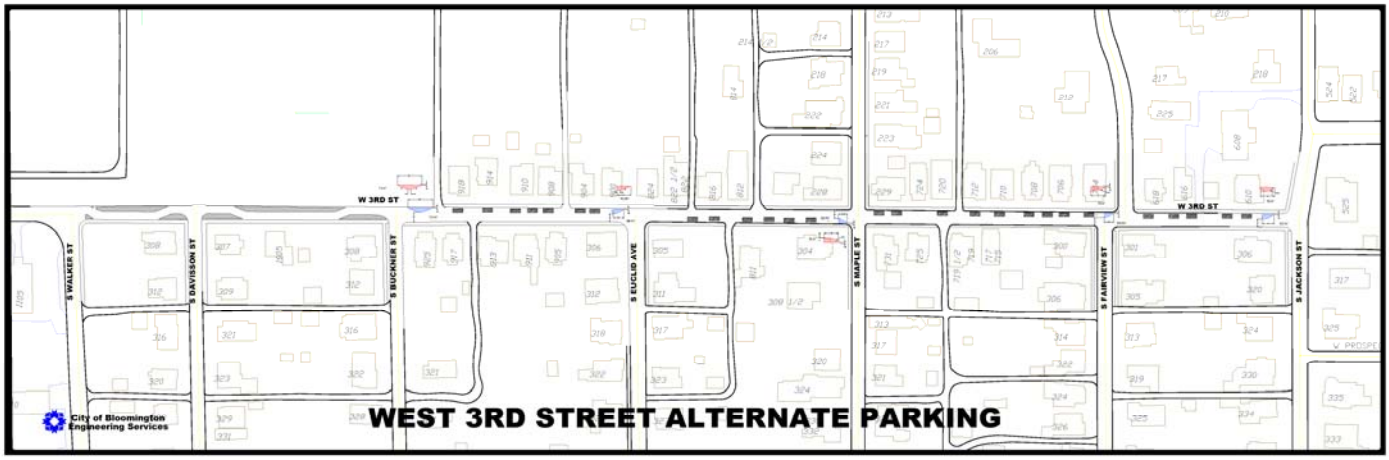
This schedule led to April of 2011 with the first round of testing as originally proposed. The Traffic Calming was modified in May of 2011 to not include the curbs on Jackson Street and to make location adjustments to the speed cushions. With Indiana University out for the summer delayed performing the follow-up traffic study to the fall of 2011. Due to existing workloads (Arterial Traffic Studies for Speed Limits) we completed the traffic counts for the Third Street Traffic Calming in October of 2011.

The final portion of step 7 is the determination of the Bicycle Pedestrian Safety Commission that the initial design criteria have been met. A scheduled hearing for the Commission is scheduled on February 27th, 2012.

Design Considerations / Methodology

Currently installed traffic calming measures.

In 2003 the Neighborhood and the City worked together for the successful completion of the NTSP request. The petitioner requested studies to address excessive speeds and volumes along 3rd Street. This petition resulted in the installation of chicanes, a horizontal deflection traffic control device, along W 3rd Street from S Walker St to S Buckner St. Additionally, staggered parking zones from S Buckner St to S Jackson St were created. Speeds along the street were reduced by 8 mph to 9 mph and brought in line with typical values for neighborhood streets.



DEVICES	SAFETY	SPEED REDUCTION	PEDESTRIAN BICYCLISTS ACCESS	TRAFFIC DIVERSION	NOISE	EXHAUST EMMISSIONS	EMERGENCY SERVICES	ACCEPTABLE FOR TRAFFIC MANAGEMENT
Police Enforcement	Improvement	Depends on Amount	Possible Improvement	No Effect	No Effect	No Effect	Diminished Reasorces	Yes
Speed Humps	Unknown	Yes	Mixed Results	Possible	Increase	Small Increase	Reduced Response	Yes
Education	Possible Improvement	Possible	Possible Improvement	N.A.	N.A.	N.A.	No Effect	Yes
Entrance Treatments	Possible Improvement	Unlikely	Possible Improvement	Mixed Results	No Effect	No Effect	Possible Problem	Yes
Curb Extensions	Improve Ped. Crossing	Unlikely	Yes	No Effect	No Effect	No Effect	Possible Problem	Yes
Partial diverters/ Diverters/Cul-de-Sac	Possible Improvement	Possible	Possible	Yes	Possible Reduction	No Effect	Possible Problem	Possible
Chicanes	Possible Improvement	Possible	Possible	Possible	No Effect	Small Increase	Possible Problem	Yes
Traffic Circles	Improved	Yes	Possible	Possible	No Effect	No Effect	Possible Problem	Yes
One-way Streets	Possible Improvement	No	Mixed Results	Possible	No Effect	No Effect	Possible Problem	Yes
Median Barrier	Possible Improvement	No	Mixed Results	Possible	No Effect	No Effect	Possible Problem	Yes
Improve Arterial Streets	Possible Improvement	Unlikely	Possible Improvement	Possible Improvement	Possible Improvement	Possible Decrease	No Effect	Limited
Traffic Control Devices: e.g. Prohibitory Signing	Possible Improvement	Unlikely	Possible Improvement	Yes	Possible Improvement	No Effect	No Effect	Possible
Traffic Control Devices: e.g. Prohibitory Signing	Possible Improvement	Unlikely	Possible Improvement	Yes	Possible Improvement	No Effect	No Effect	Possible

Figure 1, Types of traffic calming.

Street Classification.

West 3rd Street has been designated by the Growth Policies Plan (GPP) as a residential or local service street. However, a closer look at the function of the street has revealed that it is currently behaving more as a Neighborhood Collector Street. A neighborhood collector classification better represents the streets function as a connecting street from other areas in the neighborhood to major connection points on nearby arterials. The traffic volumes for West 3rd Street are nearly identical to other City collectors, for example North Lincoln Street and East Covenanter Drive. The neighborhood collector classification was further reinforced by neighborhood feedback that indicated that residents were changing their routes to use 4th Street and Howe to access their homes. Though it is favorable to reroute traffic to higher classification roadways it is unfavorable to promote any changes in a neighborhood that redirects local residents to other neighborhood streets. However, due to the limitations set forth in the NTSP and the current designation as a neighbor service street in the GPP, balloting for the project was limited to only those properties that must use the project street as their primary access.

Traffic Speeds

Initial 2001 85th percentile speeds in the project area, prior to the installation of any traffic calming, ranged from 28 MPH to 33 MPH. With the addition of the chicanes and parking configuration the 85th percentile speed was reduced to a range of 23 mph to 27 mph. These values are consistent with other neighborhood streets throughout the City (fig 3). As expected, traffic speeds were reduced after the installation of the traffic cushions by 1 mph to 7 mph. Final speeds on the project segment from S Rogers St to S Fairview St showed the smallest reduction of no more than 3 mph. The segment from S Fairview St to S Davison St showed the greatest reductions, ranging from 3 mph to 7 mph.

Street	Percent of Vehicles by speed													
	1 - 15 mph		16 - 20 mph		21 - 25 mph		26 - 30 mph		31 - 35 mph		36 - 40 mph		> 41 mph	
	2/18/2011	10/3/2011	2/18/2011	10/3/2011	2/18/2011	10/3/2011	2/18/2011	10/3/2011	2/18/2011	10/3/2011	2/18/2011	10/3/2011	2/18/2011	10/3/2011
S Buckner St to S Davison St	4.8%	26.2%	31.3%	61.3%	50.9%	11.0%	11.5%	1.2%	1.3%	0.2%	0.1%	0.0%	0.0%	0.0%
Change	21.4%		30.0%		-39.9%		-10.3%		-1.1%		-0.1%		0.0%	
S Maple St to S Euclid Ave	4.8%	8.5%	20.8%	35.9%	55.0%	46.9%	17.8%	7.9%	1.5%	0.8%	0.1%	0.0%	0.0%	0.0%
	3.7%		15.1%		-8.1%		-9.9%		-0.7%		-0.1%		0.0%	
S Fairview St to S Maple St	6.6%	42.6%	27.6%	49.1%	46.9%	7.3%	16.5%	0.8%	2.1%	0.1%	0.1%	0.0%	0.0%	0.0%
Change	36.0%		21.5%		-39.6%		-15.7%		-2.0%		-0.1%		0.0%	
S. Jackson St to S. Fairview St	10.2%	38.1%	63.7%	52.0%	25.1%	9.4%	1.1%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change	27.9%		-11.7%		-15.7%		-0.7%		0.0%		0.0%		0.0%	

Figure 2A, Percent of Vehicles by speed

		S Rogers St to S Jackson St		Jackson, 3rd to 3rd		S. Jackson St to S. Fairview St		
Street	**Start Date**	**85th %**	**ADT**	**85th %**	**ADT**	**85th %**	**ADT**	
W. 3rd St.	10/15/2001							
	7/11/2001							
	11/15/2004							
	7/6/2009							
		No configuration change		No changes		Shift Parking		STOP SIGN
	Fall 2009					26 mph	1242	
	3/2/2010	25 mph	1384					
	7/7/2010	24 mph	1403					
	2/18/2011	25 mph	1340	19 mph	1396	23 mph	1226	
		No configuration change		Bump-out		Cushion mid-block		
	4/5/2011	28 mph	1490	18 mph	1392	19 mph	1203	
		No configuration change		remove bump-out		Cushion moved East		
	6/13/2011	25 mph	1328	18 mph	1364	20 mph	1091	
	10/3/2011	24 mph	1202	No Data		18 mph	938	
Change from 2/18/2011 to 6/13/2011		0 mph	-12	1 mph	-32	3 mph	-135	
Percent change			-0.9%	5.3%	-2.3%	13.0%	-11.0%	

Figure 2B, Traffic Counts, Rogers to Fairview.

	S Fairview St to S Maple St		S Maple St to S Euclid Ave		S Euclid Ave to S Buckner St		S Buckner St to S Davison St	
	85th %	**ADT**	**85th %**	**ADT**	**85th %**	**ADT**	**85th %**	**ADT**
STOP SIGN			28 mph	1002			33 mph	984
							29 mph	1177
			28 mph	1029			27 mph	1032
			20 mph	1206	29 mph	1200	25 mph	1165
	Shift Parking		Shift Parking		Shift Parking		Chicanes	
			19 mph	1172	29 mph	1114	25 mph	1138
	27 mph	1239						
	28 mph	1201						
	27 mph	1260	27 mph	1242			25 mph	1217
	Cushion mid-block		Cushion mid-block		Cushion mid-block		No configuration change	
	18 mph	1248	21 mph	1224			25 mph	1206
	Cushion moved East		Cushion moved West		Cushion moved West		No configuration change	
	20 mph	1119	24 mph	1104			Low Battery	
	18 mph	974	24 mph	954			19 mph	950
	7 mph	-141	3 mph	-138	No Data	No Data	No Data	No Data
	25.9%	-11.2%	11.1%	-11.1%	No Data	No Data	No Data	No Data

Figure 2C, Traffic Counts, Fairview to Davison

A standard measure of traffic speeds is the 85th percentile speed. This value has been established as a sound engineering design parameter and takes into account the majority of driver's behaviors. The typical value for streets with similar volumes and characteristics as West 3rd Street is an 85th percentile speed of 20 to 30 MPH. Prior to any traffic calming on West 3rd, pre 2003, the typical speeds were in excess of desired speeds. The installation of the chicanes combined with the lowering of the speed limit and staggering of the parking has generated an 85th percentile speed of 23 mph to 27 mph, depending on the segment. This value is well within the values that are seen on similar streets within the City.

Initial 2001 85th percentile speeds in the project area, prior to the installation of any traffic calming, ranged from 28 MPH to 33 MPH. With the addition of the chicanes and parking configuration the 85th percentile speed was reduced to a range of 23 mph to 27 mph. These values are consistent with other neighborhood streets throughout the City (fig 3). As expected, traffic speeds were reduced after the installation of the traffic cushions by 1 mph to 7 mph. Final speeds on the project segment from S Rogers St to S Fairview St showed the smallest reduction of no more than 3 mph. The segment from S Fairview St to S Davison St showed the greatest reductions, ranging from 3 mph to 7 mph.

Street Name	Location	Date	ADT	85th Percentile
W 3rd St	From S. Jackson St. to S. Rogers St.	2/18/2011	1340	23
W 7th St	Waldron - East	1/16/2008	1126	24
E Blue Ridge Dr	From N. Walnut St. to N. Blue Slopes Dr.	6/1/2011	990	24
E Grimes Ln	West of Woodlawn	11/30/2005	1156	25
S Fess Ave	From E. Hunter Ave. to E. Atwater Ave.	3/25/2009	1020	26
W 3rd St	From S. Maple St. to S. Fairview St.	2/16/2011	1260	27
W 7th St	From N. Pine St. to N. Oak St.	10/29/2008	1106	28
N Willis Dr	From W. Westfield Rd. to W. Ridge Rd.	8/23/2010	1257	28
E Covenanter Dr	From S. Pickwick Pl. to S. Nota Dr.	8/3/2010	1170	29
E 7th St	From N. Bryan Ave. to N. Jefferson St.	4/19/2011	2052	29
W 15th St	E. of Woodburn	2/8/2006	855	30
E Covenanter Dr	From S. Nota Dr. to E. Woodbine Ave.	3/9/2011	941	30
E Heather Dr	West of Pepperchase	9/6/2005	1112	31
S Meadowbrook Dr	From S. Reisner Rd. to E. Cameron Ave.	2/2/2010	108	33
E Hagan St	From S. Smith Rd. to S. Park Ridge Rd.	6/9/2010	1049	34
S Mitchell St	From E. Southdowns Dr. to E. Maxwell Ln.	4/21/2009	1006	35

Figure 3, Comparison of 85th percentile.

Traffic Volumes

Traffic volumes in the West 3rd Street project area are slightly larger than most typical residential streets. This is a leading indication that some cut through traffic may exist. The difficulty of a traffic safety program is to find a solution that does not redirect traffic to neighboring roads of equal or less classification. An ideal solution would be to have any diverting traffic use higher order roads, in this case West 2nd Street or Kirkwood Ave. In order to monitor these affects of the calming devices, counts were conducted on neighboring street. As expected, the installation of speed cushions reduced the traffic volumes on the project street. The counts indicate an 11% reduction in traffic on 3rd St from S Jackson St to S Euclid. Consequently, an increase in traffic volume has been counted on the neighboring residential and arterial streets (Fig 2). The NTSP sets a threshold of 150 Vehicles per day increase on any adjacent neighborhood streets as a limiting warrant for traffic calming. The largest increase on a neighboring local street was seen on W 4th Street that experienced an increase of 148 vehicles or 26.3 %. W Howe Street experienced a smaller increase of 128 vehicles but a larger increase in impact with a 31.1% increase in traffic volume. Positive traffic diversion was experienced on both W 2nd Street and W Kirkwood Ave, with an average increase of 8.8%. It is important to note that some limitations exist in the traffic counts and that these percentages are subject to change from day to day. As a baseline, the combined volumes of W 2nd Street and W Kirkwood Ave were monitored. These volumes can change from day to day by up to 6 % and thus a +/- 6 % should be considered when comparing traffic volumes across any time frame. However, even with an error factor applied to the counts, a noticeable increase in both positive and negative traffic diversion has been observed.

Though there were a few incidences of excessive speeds recorded in the data prior to the installation of the speed cushions, there were not enough events to indicate an atypical pattern of aggressive driving. Comments from area residents indicated that after the installation of the cushions, there was a period of aggressive driving in response to the new traffic calming. As is typically observed, these incidences diminish as drivers become accustomed to the devices.

The majority of the traffic on West 3rd Street was classified as non-industrial and thus no noise studies were conducted for this evaluation.

Cut through traffic and exclusive use of the streets.

One of the concerns presented by the Neighborhood was that noise levels were too high. The classification data gathered in the neighborhood indicated a typical spread with a majority of passenger cars and trucks and an occasional larger vehicle, 3 axels or more. Noise levels on 3rd street were not observed to be higher than the typical values for a residential street. After the addition of the speed cushions, an anticipated increase in noise was observed as vehicles would brake and accelerate between the devices.

		S Rogers to S Jackson		S Jackson to S Fairview		S Fairview to S Maple		S Maple to S Waldron	
	Start Date	**85th %**	**ADT**	**85th %**	**ADT**	**85th %**	**ADT**	**85th%**	**ADT**
W. 4th St.	7/29/1996						765		
	3/2/2010	28 mph	838						
	7/7/2010	27 mph	950						
	1/12/2011						448		318
	2/18/2011			29 mph	562				
	Installation of traffic control on 3rd Street								
	4/5/2011			29 mph	655				
	Reconfiguration of traffic control on 3rd Street								
	6/13/2011			28 mph	710				
	10/3/2011			27 mph	638				
	10/10/2011	24 mph	823						
Change from 2/18/2011 to 6/13/2011		No Data	No Data	1 mph	148	No Data	No Data		
Percent change		No Data	No Data	5.3%	26.3%	No Data	No Data		

		S. Fairview St. to S. Rogers St.	
W Howe St	Start Date	85th %	ADT
	3/2/2010	26 mph	466
	7/7/2010	29 mph	514
	2/18/2011	30 mph	412
	Installation of traffic control on 3rd Street		
	4/5/2011	29 mph	651
	Reconfiguration of traffic control on 3rd Street		
	6/13/2011	28 mph	540
	10/3/2011	27 mph	474

Change from 2/18/2011 to 6/13 2011	1 mph	128
Percent change	No Data	31.1%

Figure 4, Traffic Counts, Howe and 4th St

		S. Fairview St. t N Jackson St	
W Kirkwood Ave	Start Date	85th %	ADT
	3/2/2010	34 mph	10900
	2/16/2011	34 mph	9967
	Installation of traffic control on 3rd Street		
	4/5/2011	34 mph	11338
	Reconfiguration of traffic control on 3rd Street		
	6/13/2011	32 mph	10688
	10/3/2011	32 mph	11803
Change from 2/18/2011 to 6/13/2011		2 mph	721
Percent change		5.9%	7.2%

Plus

		S. Maple St to S. Rogers St.	
W 2nd St	Start Date	85th %	ADT
	3/2/2010	36 mph	16421
	2/16/2011	38 mph	14742
	Installation of traffic control on 3rd Street		
	4/5/2011	35 mph	16605
	Reconfiguration of traffic control on 3rd Street		
	6/13/2011	36 mph	16206
	10/3/2011	34 mph	14438
Change from 2/18/2011 to 6/13 2011		2 mph	1464
Percent change		5.3%	9.9%

Equals

Total ADT Parallel Arterials
27321
24709
27943
26894
26241
2185
8.8%

Figure 5 Traffic Counts, Kirkwood and 2nd

Other Design options

- Installation of Stop Signs – The required warrants for additional stop signs along W 3rd Street were not met. Furthermore, it has been shown that the addition of unwarranted signs tend to decrease public safety.
- Entrance Treatments – As part of the South Rogers Streetscape project it is proposed to reconstruct the intersection of South Rogers Street and West 3rd Street. The exclusive straight lane will be eliminated for Westbound 3rd Street and new curbs and islands will be constructed to discourage pass-through traffic.
- Police Enforcement and Education – Police have been notified of the petition and have been present at the public meetings. They have indicated that they will make an effort to increase a presence in the area but that resources are tight and most Officers are being directed to higher crime areas.
- Partial diverters, Diverters and Cul-de-Sacs – Due to emergency services, these options have not been included into this study. Any total closure of a roadway may have the unintended consequence of delayed response times. It has further been demonstrated in other cities that these areas attract an undesirable criminal presence and thus are discouraged by law enforcement.

Public Opinion.

Two public meetings, the first on 01-25-2010 and the other on 11-18-2010, were conducted. Both meetings were advertised to the public by distributing flyers to properties located on the project street and all connecting streets within 300 feet of W 3rd Street.

City Engineering has received many calls from the public in regards to the installed test. The comments were nearly split 50/50 between positive and negative. Many of the negative comments were directed towards the bump-out on Jackson and the potential for traffic being diverted onto 4th Street and Howe. Positive feedback was more directed towards a perception of a more livable neighborhood and a feeling of elevated safety by the residents.

In general, public opinion for the proposed traffic cushions appears to be based on the location of the resident. A strong negative feedback has been displayed from residents on West 4th Street and West Howe Street. Most of the feed back has been a general concern about re-routed traffic on other local streets. However, the residents along the project street appear to be in favor of the installation of the additional traffic calming.

Balloting.

As directed in step 6 of the NTSP, the Engineering Department mailed confidential ballot forms (appendix A) to the residents of properties that must use West 3rd Street as their primary access. Of the initial 57 ballots, 39 were returned or 68.4%, with 74.4% of the returned ballots voting 'Yes' and 25.6% voting 'No'. In total, out of the original 57 ballots, 50.9% returned a vote in support of the traffic calming.

Out of the 38 homes on the original petition, 23 voted in favor of the speed cushions, 5 voted in opposition of the cushions and 9 failed to return a ballot.

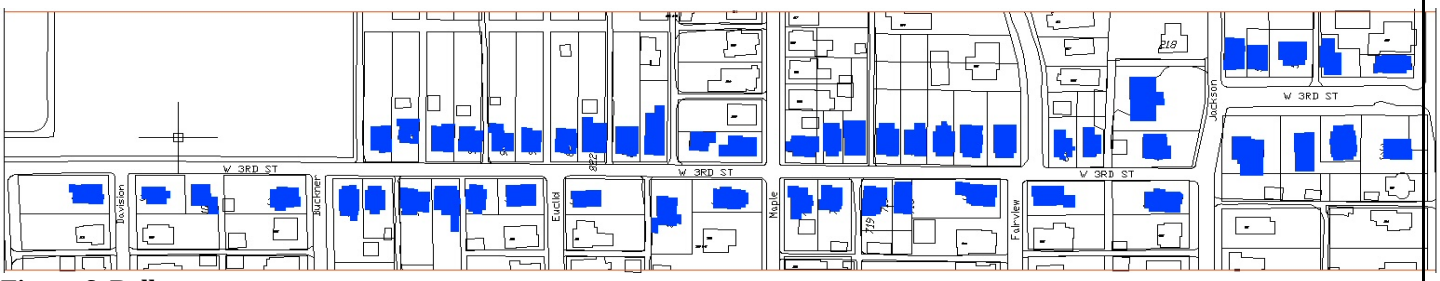


Figure 6, Ballot area.

.

Emergency services

09/27/2011 – IU Health ambulance service was interviewed on site. In that interview, they had mentioned that the ambulance service will route North on Maple or Euclid and

thus avoid the majority of the speed humps. They did not indicate that this is a change in their pattern but rather the best path from the Hospital to 3rd. They indicated that the older style of humps has a negative effect on patients and equipment but that the newer style seems to be OK. It was observed in testing that the newer style of cushions is too large for the ambulances to straddle and therefore the vehicles must slow down.

03/30/2011 - Bloomington Fire Department were interviewed on site to evaluate the speed cushions. There comments were mostly negative and felt the cushions would slow response times and cause damages to their trucks. Video tape was taken of them driving their larger ladder truck #1 across the speed humps at different speeds. The Fire Department also video taped the assessment and voiced a considerable opposition to the controls.

Early March 2011 – Bloomington Police Department was asked to evaluate the cushions. They declined to do any testing and have a neutral position.

Accidents

Accidents play a major contributing factor in the implementation of any traffic calming device. For this project, a 10 year time frame was selected so that an evaluation of past improvements could be analyzed. From 2003 to December 2004 a total of 11 accidents have been reported (fig 5). Five accidents involved the installed 2003 traffic control devices. Of these five accidents, two were a result of snow or ice and two had contributing circumstances of unsafe speeds. Eight of the eleven accidents involved a driver 20 years old or less. No reported accidents involved a bicycle or pedestrian.

Accident	Date	Light Conditions	Weather Conditions	Surface Conditions	Driver Contributing Circumstances	Vehicle Contributing Circumstances	Environment Contributing Circumstances	Notes
901674687	8/10/2011	Daylight	Clear	Dry	Wrong way on One Way	None	None	OWI, involved in accident at Jackson and 3rd.
901227349	12/8/2009	Dark	Cloudy	Dry	Unsafe Backing	None	None	Garbage truck backing Eastbound into parked car.
901085676	4/5/2009	Daylight	Clear	Dry	Ran off Road.	None	None	Collision with Traffic Calming Device.
901048388	1/23/2009	Daylight	Clear	Dry	Unsafe Speed	None	None	Driver struck curb while driving through traffic calming.
900941264	8/11/2008	Daylight	Clear	Dry	None	None	None	Damage to parked car.
900549676	9/16/2006	Daylight	Clear	Dry	Failure to Yield	None	None	3rd and Fairview, disregarded stop sign.
900446490	3/2/2006	Dark	Clear	Dry	Wrong way on One Way	None	None	Turned onto 3rd from Walker and hit Traffic Calming Device
1907897	2/24/2005	Daylight	Snow	Snow/Slush	Speed too Fast for Weather Conditions	None	Roadway Surface Condition	Westbound on 3rd and lost control on snow then struck wall.
1488372	5/8/2004	Daylight	Clear	Dry	Overcorrecting /Over steering	None	None	Swerved to miss curb (Traffic Calming) and hit wall.
1442400	1/31/2004	Unknown	Clear	Snow/Slush	Other	None	None	Hit and run during the night.
210878	12/20/2003	Daylight	Clear	Ice	Unsafe Speed	None	None	Skidded on ice into traffic calming device.

Figure 7, 10 year accident history.

Remaining Processes

The remaining steps for completion of the application are as follows;

Step: 7 Testing and Evaluation of Traffic Calming Device. The Bicycle Pedestrian Safety Commission will determine whether the testing and evaluation have met the original criteria. If they are satisfied with the results they may validate the petition and advance it to the step 8.

Step 8. Common Council Action. Based on the project evaluation and a positive ballot, City staff members prepare a report and recommendations for the Bicycle and Pedestrian Safety Commission to forward to the Common Council for action. The report outlines the process followed, includes the project findings, and states the reasons for the recommendations.

If a project does not obtain the required ballot approval, it is not forwarded to the Common Council.

Step 9. Board of Public Works. After the project has been approved by the Common Council, detailed project plans, specifications and estimates will be prepared by City Engineering staff.

Before the project(s) can be constructed by the City's Street Department or let for bidding by construction companies, the project plans and construction fund expenditures must be approved by the Board of Public Works.

If a project is not approved, it will be referred back to the Engineering staff to address the Board's concerns.

Step 10. Construct Permanent Traffic Calming Device(s). Construction is administered by the City and is generally completed during the following construction season.

Step 11. Maintenance. The City of Bloomington Engineering and Street Departments are responsible for the construction and maintenance of any traffic calming device implemented as part of this program. The Traffic Division is responsible for any traffic signing and pavement marking or delineation. Any trees planted within the right-of-way are the responsibility of the Parks and Recreation Department and any landscaping (not including trees) is the responsibility of the neighborhood association.

Step 12. Follow-up Evaluation. Within six months to one year after construction of an NTSP project, the City may conduct a follow-up evaluation to determine if the project's goals and objectives continue to be met. This evaluation may entail traffic studies of volumes, speeds and accidents as well as public opinion surveys.

Recommendations

At this time, Staff does not recommend the installation of permanent speed cushions along West 3rd Street. Staff feels that negative effects of the cushions on the entire Prospect Hill Neighborhood and emergency services out weigh the small decrease in traffic speed and volume. Other negative impacts of the cushions have been more aggressive drivers and an increase in noise levels. The 26% increase in traffic on West 4th Street and the 31% increase on West Howe Street is a strong indication of diverted traffic and not consistent with the outlined principles of the Neighborhood Traffic Safety Program. Furthermore, Staff could not find any evidence that an increase in volume or noise has resulted from the initial traffic calming installation. Although the volume data

does indicate a portion of the traffic on West 3rd Street is cut-though traffic, it does not appear to be larger than the 40% standard threshold for correction. Engineering Staff recommends the following actions be taken in the project area.

(1) Removal of the temporary traffic calming test cushions and restoration to the initial traffic calming plan.
(2) Improvements are made to the intersection of West 3rd Street and South Rogers Street as indicated in the proposed Streetscape plan.
(3) Improvements to West 2nd Street and West Kirkwood Avenue are made to increase safety and efficiency of vehicular traffic.
(4) Working with law Enforcement to increase Police presence.
(5) Continue to monitor the area as part of the initial NTSP request for any changes to traffic patterns.

RESOLUTION 2004-28
BOARD OF PUBLIC WORKS
Prospect Hill Neighborhood Association Landscaping Agreement

WHEREAS, Indiana Code 9-21-4-3 authorizes cities to install traffic calming devices on public streets as long as their design and use conform to generally accepted engineering principals of road design; and

WHEREAS, On May 24, 2002, the Prospect Hill Neighborhood Association applied to the City of Bloomington Neighborhood Traffic Safety Program for a traffic calming installation, and said traffic calming installation on West Third Street has been installed as of June 24, 2004, but has not been landscaped; and

WHEREAS, according to the Neighborhood Traffic Safety Program Section Entitled "Landscaping", landscaping will be selected by the neighborhood association or the City Parks and Recreation Department from an approved landscaping materials list provided by the City. Materials will be provided and installed by the City and will be maintained by the neighborhood association. If the landscaping is not maintained, the traffic control device will be topped with concrete or asphalt pavement; and

WHEREAS, Prospect Hill Neighborhood Association agrees to maintain the landscaping in a safe and reasonable manner without leaving tools where they will be a hazard for pedestrians or vehicles.

Now, Therefore, Be it Resolved, that the City of Bloomington will proceed with landscaping said traffic devices on West Third Street upon acceptance of this Agreement.

Board of Public Works
City of Bloomington

_____
Beth Hollingsworth, President

Frank N Hrisomalos MD
Dr. Frank N. Hrisomalos

Charlotte Zietlow
Charlotte Zietlow

Approved and Accepted by the Prospect Hill Neighborhood Association of the City of Bloomington, Monroe County, Indiana upon this 30th day of June, 2004.

Prospect Hill Neighborhood Association Representative

Appendix A, BPW Resolution 2004-28

Signature Patrick Murray

Title Secretary

RELEASE, HOLD HARMLESS AND INDEMNIFICATION AGREEMENT

WHEREAS, the undersigned, Prospect Hill Neighborhood Association, hereinafter referred to as "Releasor," has agreed by Board of Public Works Resolution 2004-28, to maintain plantings in traffic calming islands on West 3rd Street; and

WHEREAS, in order to maintain said plantings Releasor will be working on public property of the City of Bloomington, specifically: traffic calming devices on West 3rd Street; and

WHEREAS, the Releasor seeks permission by the City of Bloomington Board of Public Works to use the described property, and in partial consideration of such permission, agrees to execute this Release, Hold Harmless and Indemnification Agreement; and

NOW THEREFORE, in consideration of permission from the City of Bloomington Board of Public Works for use of the described property, the Releasor hereby agrees to release, hold harmless and indemnify the City of Bloomington, its officers, employees, agents and assigns from any and all claims, causes of action, suits, proceedings or demand which may arise as a result of Releasor's use of the described property. This includes, but is not limited to, claims for personal injury, property damage, and/or breach of contract, whether brought by the Releasor, its employees or agents, or any third party.

IN WITNESS WHEREOF, the undersigned has executed this Agreement with full knowledge of its significance and with the intent to be bound by it.

Prospect Hill Neighborhood Association

by Patrick Murray
Signature

June 30, 2004
Date

PATRICK MURRAY
Printed Name

Secretary, PHNA.
Position

Appendix

Appendix B, 2009 Application.

City of Bloomington, Neighborhood Traffic Safety Program
Participation Application

Please fill out the following request form as accurately as possible hand deliver to the City of Bloomington Engineering Department, 401 N. Morton St., Suite 130, or return by mail to address at bottom of page.

Name: Karen Knight Date: 11/5/9
Telephone #: 812 361 4362 e-mail: Knight3058@gmail.com
Neighborhood Association (If Applicable): Prospect Hill
Street Name(s): Third St.
Section and Township of Neighborhood (If known):
City Councilperson Signature:
Chris Sturbaum Date: 11/5/09

General Description of Problem:
Please be as descriptive as possible. Include references, if applicable, to excess speed, cut through traffic, congestion/excess volume, safety concerns, running/ignoring regulatory signs, etc. If necessary, use another sheet of paper and attach to this application.

We are asking for modifications of the traffic problems we are experiencing on W. 3rd St from Rogers to Walker. The traffic volume and driver aggressiveness has noticeably increased and we are shocked and disturbed by the change. Our street has become an inappropriate cut through [illegible]

Suggestions and Comments:
Suggestions are very helpful to City staff so that we can get a better feel of what your neighborhood wants to accomplish from this program, and what types of studies would be most appropriate. This can include changes to infrastructure, educational programs, increased enforcement, or any other measure that you, as a neighborhood or group, feel that the City can do to address your concerns. A process that has proven to be very helpful is when neighborhoods and groups conduct surveys beforehand and include them with the application. If necessary, use another sheet of paper and attach to this application.

Justin Wyatt has suggested a traffic island at the beginning of the neighborhood. Neighbors have recommended speed bumps or changing the direction of the road at certain points. We will continue to research other options.

NOTES

Neighborhood Traffic Safety Program:
Copies of the complete NTSP are available from the City Engineering Department anytime during regular business hours. It is highly recommended that the entire process be carefully reviewed before any application is made.

Questions about the application or the NTSP:
Any questions about the NTSP or the application should be directed to: Sara Kloosterman (812) 349-3417 or kloostes@bloomington.in.gov

In General:
It is also encouraged for the applying party to have a 'pre-application' meeting. In this meeting the Engineering Department can provide assistance such as mailing lists, maps of the areas in question and general advise and guidance in other matters, such as determining effected areas for the application.

Resident Signatures:
A petition, with signatures and addresses, from at least 51% of the effected residences/businesses in the neighborhood or area must be attached to this application for submittal. Each household or business is entitled to ONE signature on the petition. The City Engineering Department will verify all addresses.

Mailing address: Sara Kloosterman
City of Bloomington Engineering Department
P. O. Box 100
Bloomington, IN 47402

Thank you for your interest in the City of Bloomington Neighborhood Traffic Safety Program

Appendix A, BPW Resolution 2004-28

MINUTES
BICYCLE AND PEDESTRIAN SAFETY COMMISSION
December 14, 2009

MEMBERS	Present: Mike Gavin, Melissa Henige, Mitch Rice, Jim Rosenbarger, Gayle Stuebe Absent: Christie Popp
EX OFFICIO	Joe Fish, Planning Department Susie Johnson, Public Works Department Justin Wykoff, Engineering Department Margie Rice, Legal Department Denise Dean, Public Works Department
ADVISORY MEMBERS	Steve Cotter, Parks & Recreation Kevin Sears
PUBLIC	
APPROVAL OF MINUTES	Rice made the motion to approve the minutes of the October 19th & November 16th meetings. Henige seconded the motion. The motion carried with a vote of 5-0-0.
PUBLIC COMMENT	There was none at this time.
COMMISSION MEMBER'S COMMENTS	
PROJECT UPDATE	Henige stated she had gone to the Board of Public Works meeting two weeks ago and gave them an update on what the Commission has been working on.
DEPARTMENT UPDATES	
Planning Department - Joe Fish	Fish had none at this time.
Engineering Dept. – Justin Wykoff	**West 3rd Street Traffic Calming:** Wykoff stated the neighborhood had gone through the NTSP process in 2001 for traffic calming and the chicanes were installed. The neighborhood is now coming back for additional traffic calming. They neighborhood feels the volume and speeds are still too high and the chicanes are not effective enough. Wykoff stated the Engineering Department had conducted counts before and after the installation of the

chicanes. The numbers show the speeds have gone down. Wykoff stated the neighborhood recently went before the Traffic Commission to have the speed limit lowered to 25 MPH and this was approved and the signage has been changed. The City temporarily installed a multi-way stop at 3rd & Walker but the findings showed there was not much of a difference in speeds. Karen Knight stated the stop sign was only up for 2 weeks but in that time the residents saw a difference in speeds. Knight stated the residents have talked with Wykoff & the City about alternative traffic calming ideas and some suggestions were: changing the directions of some streets, speed bumps and changing the timing of the signal at Rogers & 3rd Streets. One main aspect was having the entrance into the neighborhood at 3rd & Rogers be similar to that at 6th & Rogers (i.e. traffic circle). Knight stated the neighborhood and the traffic coming through has changed since they first came before the Commission in 2001. The drivers are more aggressive. Gavin stated he did not know if more traffic calming will make drivers more civil but it could help to slow down traffic. Cotter stated the numbers show the chicanes worked. It seems people may have become aggressive due to the initial traffic calming devices and more traffic calming may make them more aggressive. Sears stated he has walked through this area for the past 4 years and doesn't see the speeding. He mainly goes through in the a.m. so the problem may be more in the evenings. Wykoff stated at this time he needs to the approval of the Commission to enable the neighborhood to go onto the next step which would be the public meeting. Stuebe made the motion to approve the request that the West 3rd Street Traffic Calming proposal go onto the next step of the NTSP. Henige seconded the motion. The motion carried with a vote of 5-0-0.

East 17th Street East/West of Jordan Avenue:

The project from last year ended at the Church just west of the intersection. This project will continue with the side path on the north side as well as bring down the grade of the hill to improve visibility. Cotter stated there needed to be street cuts for the side paths. Rosenbarger stated he is worried about the speeds coming from 17th & Fee. Wykoff stated that there had been 2 accidents in the past year but none were related to speeds. Johnson stated the City would bring an actual set of plans for the Commission members to review.

Appendix C, BPSC Minutes 12/14/09

Bicycle and Pedestrian Safty Commission, 12-14-2009.

MINUTES
BICYCLE AND PEDESTRIAN SAFETY COMMISSION
May 17, 2010
INTRODUCTIONS

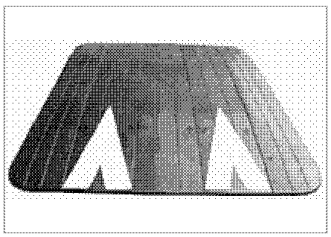
MEMBERS	Present: Mike Gavin, Melissa Henige, Anne Phillips Holahan Mitch Rice, Jim Rosenbarger, Jacob Sinex, Gayle Stuebe Absent:
EX OFFICIO	Joe Fish, Planning Department Justin Wykoff, Engineering Department Sara Kloosterman, Engineering Department Denise Dean, Public Works Department
ADVISORY MEMBERS	Steve Cotter, Parks & Recreation

Prospect Hills-Traffic Calming:
Wykoff stated chicanes were installed in 2002. The City did recent counts in the area which show the speeds have lowered but the neighbors are concerned with the increase in volume. The City was getting ready to install a mock up traffic calming circle at 3rd & Rogers. This would be similar to the one at 6th & Rogers. They were also going to install speed "cushions". These devices allow some emergency vehicles (i.e. fire trucks) to go through but cars/trucks need to go over. The City would conduct counts before and after the installation. Rice asked if the neighborhood was trying to eliminate cut through traffic or trying to slow traffic down. Rosenbarger stated he is glad the City is doing the mock up.

Toll Free: 866-424-6981

Speed Cushion Speed Table

RubberForm's speed cushion - speed table safely control traffic and reduce vehicle speeds to 20-30 mph with RubberForm Speed Cushions. Made from 100% recycled rubber tires, our high-traction speed cushions are highly visible and extremely durable. Unlike a traditional traffic calming devices, our speed cushion is designed to slow traffic while having a minimal effect on emergency response time. Easy-to-install, modular sections. Place them strategically on streets, residential thoroughfares and pedestrian zones; in parking lots and parking garages; and at schools, universities, hospitals and apartment complexes. Our speed cushions quietly and effectively slows traffic without vehicle or tire damage. Increases pedestrian safety. Installs easily with lag bolts. Simply drill a hole with a masonry bit and penetrate the asphalt or concrete surface below. Removable for road surface maintenance. In addition, adding speed cushions typically reduces traffic volume approximately 20% on cut-through sreets.



Got a question?
Ask Mr. Crumb

(http://www.rubberform.com/contact.php

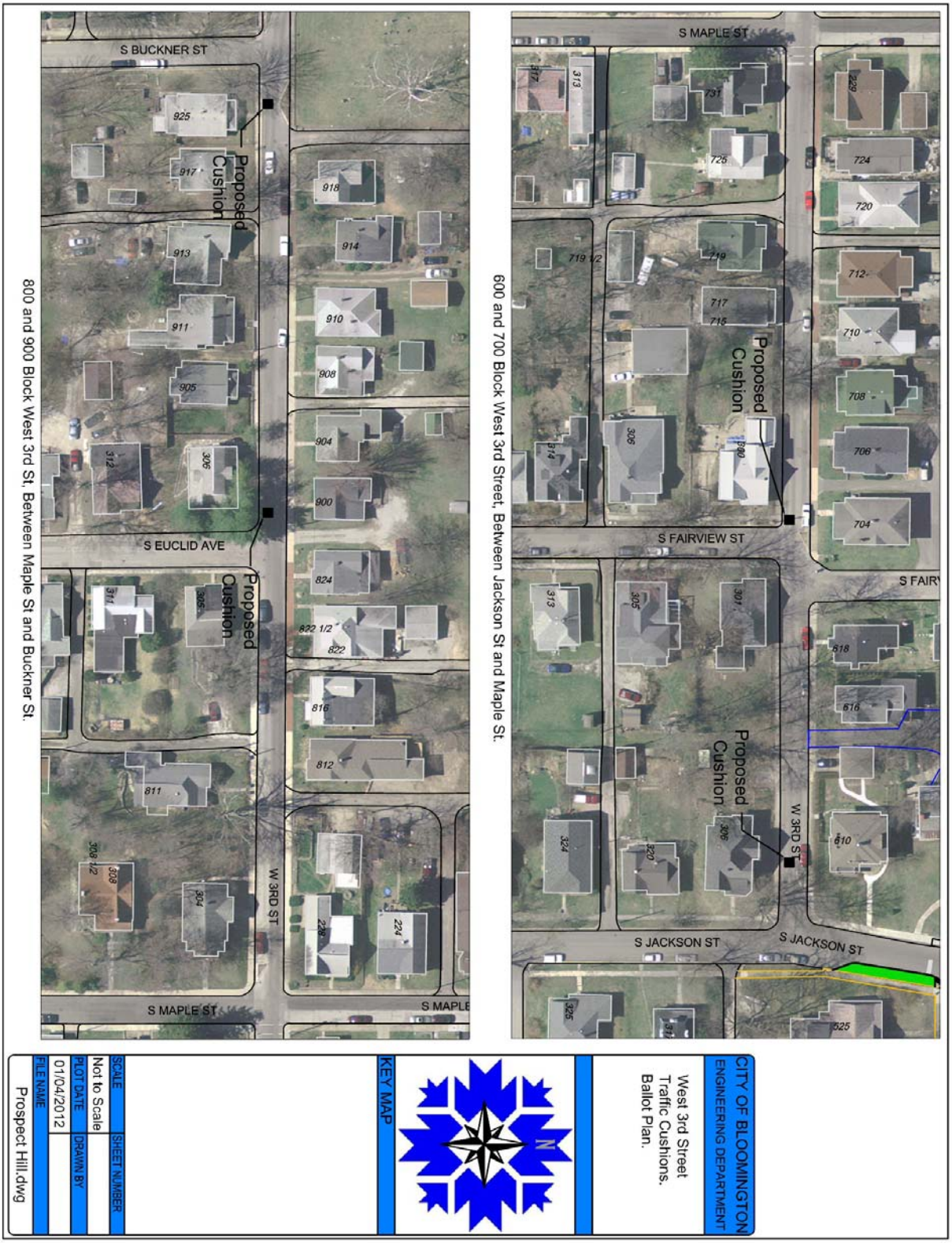
Features (#features) | **Specifications (#specifications)** | **Photos (#photos)**

Request A Quote (#getquote)

RF-SPC
The cushion is bolted to the pavement using anchors, stainless steel lag bolts and stainless steel washers.
Standard Size: 6'6" Wide x 6'8" Long x 3" High
Made In America with American Recycled Tire Rubber
Standard Size: 6'6" Wide x 10' Long x 3" High
Width can be altered in 16" increments and length can be added in 40" increments.

One 6'6" x 6'8", 500-pound recycled rubber speed cushion diverts 33 to 34 tires out of an American landfill.

Appendix E, Speed cushion white paper.



Appendix F, Area Map

Bicycle and Pedestrian Safety Commission
Agenda
Monday, July 19, 2010
5:30 p.m. - Hooker Conference Room

I. INTRODUCTIONS

II. APPROVAL OF MINUTES

May 17, 2010

III. PUBLIC COMMENT
(Items not on the agenda) Limit 3 minutes per person.

IV. COMMISSION MEMBER'S COMMENTS

V. PROJECT UPDATE

A. Individual Comments

VI. DEPARTMENTAL UPDATES

A. City Planning
1). Bicycle and pedestrian counts
B. City Engineering

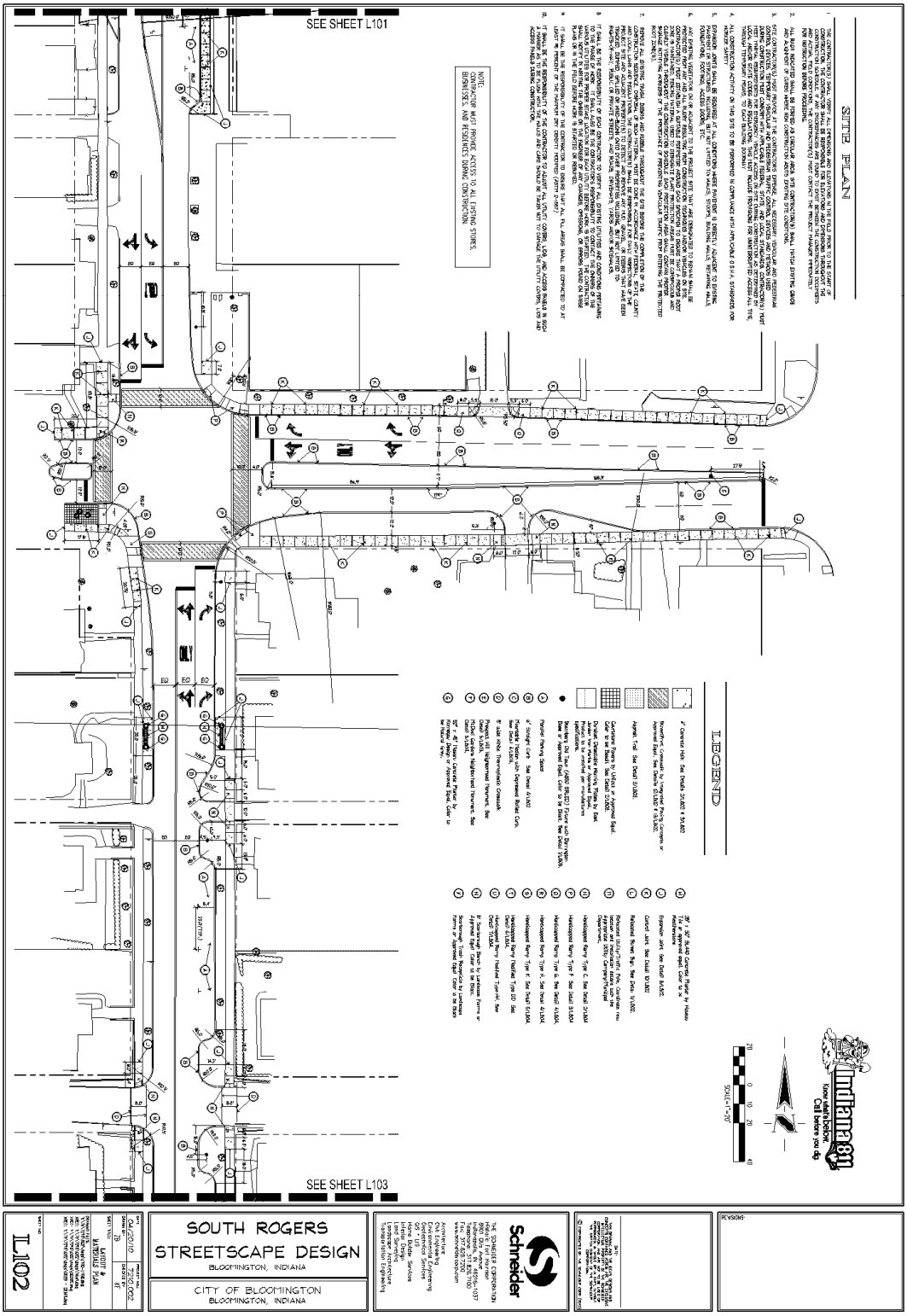
VII. NEW BUSINESS

A. Platinum Bicycle Task Force appointment

VIII. OLD BUSINESS

NEXT WORK SESSION: Monday, August 2, 2010 at 5:30 p.m. in the Hooker Conference Room at the Showers Building.

NEXT MEETING: Monday, August 16, 2010 at 5:30 p.m. in the Hooker Conference Room at the Showers Building.



Appendix H, Proposed Streetscape, South Rogers

West 3rd Street Traffic Calming Ballot

On November 5th, 2009, the City of Bloomington received a formal application from Prospect Hill Neighborhood Association for traffic calming for West 3rd Street from South Rogers Street to South Walker Street. The City Engineering Department has reviewed the case, conducted Public meetings and has prepared this proposed plan. The plan will call for the installation of a grass plot bump-out on the East side of Jackson Street and 4 speed cushions on 3rd Street (see enclosed prints). Speed cushions are comparable to small speed bumps except that they lessen the negative effects on emergency vehicles or bicycles and are gentler on cars. The street modifications that have been requested by your neighborhood are considered traffic calming and therefore must follow the guidelines and processes of the Neighborhood Traffic Safety Program "NTSP". The next phase of the NTSP process (Step 6) calls for a ballot to determine neighborhood support for the proposal. This ballot will be used to determine if the street modifications will be approved by the residents and if so, then a 1 month period of testing the proposed plan will take place. After a successful testing period the plan will be forwarded to the Bloomington City Council for their consideration.

Please **PRINT** your name and address so that we may verify the eligibility of your response to this survey. Your response below will be separated from this information — your name will not be associated with your vote on this issue. Only one vote is allowed per residence, and only original ballot forms will be accepted.

RESIDENT NAME: _____

RESIDENT ADDRESS: _____

_____

This ballot will be separated by City Engineering Department staff. Please do not separate before sending.

DRAFT

West 3rd Street Traffic Calming Ballot

Please check only one answer. No special comments will be considered on this form. If a given response is not marked, this ballot will be considered a non-response. If you have a question, concern, OR need clarification prior to voting please call **Roy Aten, Engineering Field Specialist**, at (812) 349-3417.

This BALLOT must be received or postmarked by ***DATE* to be considered valid.**

☐ ***YES:*** As a resident in the Prospect Hill Neighborhood, I ***AM*** in favor of the permanent placement of the specified traffic calming devices on 3rd Street.

☐ ***NO:*** As a resident in the Prospect Hill Neighborhood, I ***AM NOT*** in favor of the permanent placement of any traffic calming devices on 3rd Street.

UNAUTHORIZED DUPLICATION OF THIS BALLOT IS PROHIBITED
ONLY ORIGINAL BALLOT FORMS WILL BE ACCEPTED

.

Appendix I, Traffic Calming Ballot

NEIGHBORHOOD TRAFFIC SAFETY PROGRAM

cityofbloomingtonindiana

PREPARED BY THE
CITY OF BLOOMINGTON, INDIANA
ENGINEERING DEPARTMENT
AND THE BICYCLE AND

PEDESTRIAN SAFETY COMMISSION

Table of Contents **Page**

INTRODUCTION 2
Objectives 2
Policies 3
Procedure/Process 3
Step 1. Apply to Participate 4
Step 2. Engineering Staff Review and Preliminary Data Collection 4
Step 3. BPSC Review of Engineering Studies and Petitions 4
Step 4. Public Meeting 4
Step 5. Preparation of Alternative Designs and Selection of Proposed Plan 5
Step 6. Project Ballot 5
Step 7. Testing and Evaluation of Traffic Calming Device 6
Step 8. Common Council Action 6
Step 9. Board of Public Works 7
Step 10. Construct Permanent Traffic Calming Devices(s) 7
Step 11. Maintenance 7
Step 12. Follow-up Evaluation 7

APPENDIX A
VISION AND MISSION STATEMENT OF THE CITY OF BLOOMINGTON 8

APPENDIX B
POINT ASSIGNMENT FOR RANKING NTSP REQUESTS 9

APPENDIX C
TRAFFIC CALMING DEVICES 10
1. Street and Lane Narrowing 10
2. Bicycle lanes 10
3. Raised Street Sections or Speed Humps 11
4. Full or Partial Road Closures (Semi-Diverters/Diverters/Cul-de-sacs) 12
5. Chicanes 12
6. Traffic Circles 12
7. Stop Signs 14

APPENDIX D
NEIGHBORHOOD TRAFFIC SAFETY TECHNIQUES 15

INTRODUCTION:

The City of Bloomington places a high value on neighborhood livability. Although livability can have several definitions, it can be generally thought of as encompassing the following characteristics:

- The ability of residents to feel safe and secure in their neighborhood.
- The opportunity to interact socially with neighbors without distraction or threats.
- The ability to experience a sense of home and privacy.
- A sense of community and neighborhood identity.
- The ability to conveniently, safely and enjoyably walk, bike and take transit.
- The ability of parents to feel that their children's safety is not at risk by playing in the neighborhood.
- A balanced relationship between multiple uses and needs of a neighborhood.

Neighborhood traffic conditions can have a significant impact on these characteristics.

As population and employment in the City of Bloomington and Monroe County continue to grow, Bloomington streets can be expected to experience increased pressure from traffic. One of several goals of the City of Bloomington is to manage this growth to balance our economic, social and environmental health and to maintain a sustainable City. Quality neighborhoods are the fundamental building blocks of a sustainable city, and to maintain this quality, Bloomington neighborhoods should be protected from the negative impacts of traffic.

Neighborhood groups across Bloomington have become increasingly concerned about the effects of traffic on their streets. Restraining traffic has become a common goal of concerned residents. A vision now being promoted for local streets is that motorists should be guests and behave accordingly. Many City streets used to be multi-purpose places which not only provided physical access but also encouraged social links within a community. Now, the balance has changed so that the main function of many streets has become the accommodation of traffic--some of it unrelated to the residents themselves.

At the same time, traditional Traffic Engineering means of controlling traffic--speed zoning, stop signs, traffic signals--have less and less effect in the management of driver behavior. Police enforcement is and will remain an effective tool to reinforce motorist behavior. However, it is recognized that providing an enforcement level that is effective in modifying driver behavior will require a significant commitment of Police resources.

The City of Bloomington is committed to developing an effective approach to managing neighborhood traffic. Neighborhood involvement will be an important component of this approach.

To maximize neighborhood involvement in improving local traffic conditions, the City of Bloomington Bicycle and Pedestrian Safety Committee (BPSC) with assistance from the Public Works, Engineering and Planning Departments has developed a Neighborhood Traffic Safety Program (NTSP).

Objectives

The following objectives of the NTSP are derived from existing City policies and the BPSC:

1. Improve neighborhood livability by mitigating the negative impact of vehicular traffic on residential neighborhoods.

2. Promote safe, reasonably convenient, accessible and pleasant conditions for bicyclists, pedestrians, motorists, transit riders and residents on neighborhood streets.

3. Encourage citizen involvement in all phases of Neighborhood Traffic Safety activities.

4. Make efficient use of City and citizen resources and energy.

Policies

The following policies are established as part of the NTSP:

1. Through traffic should be encouraged to use higher classification arterials, as designated in the *Master Thoroughfare Plan for the City of Bloomington Comprehensive Plan*.

2. A combination of education, enforcement and engineering methods should be employed. Traffic calming devices should be planned and designed in keeping with sound engineering and planning practices. The City Engineer shall direct the installation of traffic control devices (signs, signals, and pavement markings) as needed to accomplish the project, in compliance with the Bloomington Municipal Code. (Refer to Appendix C for a detailed description of traffic calming devices.)

3. Application of the NTSP shall be limited to local streets and to those neighborhood collector streets that are primarily residential (at least 75 percent of the properties with frontage on the street must be in residential zoning). Traffic safety projects on neighborhood collector streets shall not divert traffic off the project street through the use of traffic diversion devices. As a result of a project on a neighborhood collector, the amount of traffic increase acceptable on a parallel local service street shall not exceed 150 vehicles per day.
4. Reasonable emergency and service vehicle access and circulation should be preserved.

5. NTSP projects should encourage and enhance pedestrian and bicycle mobility and access within and through the neighborhood and enhance access to transit from the neighborhood. Reasonable automobile access should also be maintained.

6. Some traffic may be rerouted from one local service street to another as a result of an NTSP project. The amount of rerouted traffic that is acceptable should be defined on a project-by-project basis by the BPSC and City Engineering staff.

7. To implement the NTSP, certain procedures shall be followed by the Engineering Department in processing traffic safety requests in accordance with applicable codes and related policies and within the limits of available and budgeted resources. At a minimum, the procedures shall provide for submittal of project proposals, citizen participation in plan development and evaluation; communication of any test results and specific findings to area residents, businesses, emergency services and affected neighborhood organizations before installation of permanent traffic calming devices; and appropriate Common Council review.

Procedure/Process

The NTSP provides a mechanism for groups to work with the City to make decisions about how traffic safety techniques might be used to manage traffic in their neighborhood. This section describes in detail the steps involved in participating in the program from the initial application for involvement, to developing a traffic safety plan, to installing one or more traffic calming devices, to a follow-up evaluation of the plan's success.

The NTSP process is intended to ensure that all neighborhood stakeholders are provided the opportunity to be involved. This ensures that consideration of traffic problems on the study street do not result in the exacerbation of traffic problems on adjacent neighborhood streets and does not eclipse the needs and quality of the neighborhood as a whole. This includes a consideration of the impacts of traffic diversion onto collector and arterial streets.

Step 1. Apply to Participate

NTSP projects can be requested by neighborhood associations or groups, Common Council members representing a neighborhood, neighborhood business associations or individuals from the neighborhood. It should be noted that although individuals are eligible to apply they are encouraged to work with or form a neighborhood association. Requests for participation in NTSP will be made through the BPSC (application form will be provided by and returned to City Engineering staff).

The petition from a problem street or area must describe the problem (i.e., speeding, inappropriate cut-through, ignoring stop signs, etc.) and request some infrastructure change to reduce the problem. The specific form of the infrastructure change may not be known at this point. The petition must also include signatures from at least 51% of the affected street or area

households or business. This must include any other street that must use the problem street as its primary access (for example, a dead end street or cul-de-sac off the problem street). Each household or business is entitled to one signature.

Finally, any Common Council member must sign the petition as a sponsor.

Step 2. Engineering Staff Review and Preliminary Data Collection

City Engineering staff will collect preliminary information about current conditions. This will include location, description of the problem and may include preliminary collection of traffic accident data, bicycle volume pedestrian activity, traffic speed and through traffic. The Engineering Department will verify the percentage of households and businesses on the petition and if the percentage is sufficient, they shall notify the affected safety and emergency services of the initiative. The affected safety and emergency services shall include, but not be limited to, the City Police and Fire Departments and the local ambulance service. This information will be relayed to the BPSC for consideration to decide whether the request will be prioritized for inclusion in the NTSP. Requests are also reviewed for possible solutions. If the preliminary review shows that a hazard to the public exists, the City may address the problem separately from the NTSP.

Step 3. BPSC Review of Engineering Studies and Petitions

The BPSC will review the petition submitted as well as the preliminary data collected by the Engineering Department. At this point, the BPSC will either validate or reject the petition. They will also prioritize the petition with respect to other petitions and available resources within the current funding cycle (detailed in Appendix B). Petition validation is a commitment to try to do something about the problem.

Petitions with the highest priority ranking will continue to the next step.

Step 4. Public Meeting

The BPSC will send notices to all households and businesses within a defined project area to provide background information about the proposed project. The project area depends on the specific project, but generally includes all properties on the project street, on cross streets up to the next parallel local street (or up to 300 feet from the project street) and on any other street that must use the project street as its primary access. For neighborhood collector streets, the next parallel local street (if one exists within 500 feet of the problem street) will also be included in the notification area. Representatives of the emergency service providers will also receive notification of the meeting. This notice will include an invitation to participate in a public meeting to help exchange ideas, address concerns and discuss possible traffic safety alternatives.

In addition to considering traffic calming and traffic control devices, plans developed in the NTSP will also consider the positive effects of education and enforcement.

Step 5. Preparation of Alternative Designs and Selection of Proposed Plan

The Engineering Department and the BPSC will hold an informal work session to prepare alternatives that address the neighborhood problem. The neighborhood is welcome to participate in this workshop to provide input.

The BPSC will assess the problems and needs of the neighborhood and propose solutions based on citizen input and sound engineering principles. Possible solutions and their impacts will be evaluated with consideration given to:

- Estimated costs vs. potential gain
- Effectiveness
- Pedestrian, bicycle and transit access
- Community wide benefit to bicycle and pedestrians
- Overall public safety
- Positive and negative consequences of traffic division
- Emergency and service vehicle access

The BPSC will identify the preferred alternative and City staff shall prepare a ballot for neighborhood approval.

If it is determined from both the public meeting and an informal work session of the BPSC that traffic safety techniques other than traffic calming devices are the preferred alternative, the proposal may not need to proceed through the additional steps as designated in the NTSP. The City Engineering Department will continue to work with the neighborhood on alternative neighborhood traffic safety techniques.

Step 6. Project Ballot

Local Service Streets:

All of the properties on the project street and on any other street that must use the project street as their primary access are sent notification that a proposed alternative has been selected. This notification will consist of a description of the proposal as well as a confidential mail ballot asking if they are in support of the project. Each household and business is entitled to one response.

To forward a project to Common Council for action, a majority of the eligible households and businesses must respond favorably by ballot. If over 50% of all eligible ballots respond in favor of the project, then it will be forwarded to the Common Council. If, however, less than 50% of all eligible ballots respond in favor of the project, but at least 60% of those returned ballots are in favor of the project, then a second ballot shall be mailed to those addresses that did not respond to the first ballot. Ballots will be tallied for a period of four weeks from the time of distribution; ballots postmarked after the expiration date of the four-week period will not be tallied.

Neighborhood Collector Streets:

All of the properties on the project street, on cross streets up to the next parallel street (or up to 300 feet from the project street) and on any other street that must use the project street as their primary access are sent notification that a proposed alternative has been selected. This notification will consist of a description of the proposal as well as a confidential mail ballot asking if they are in support of the project. Each household and business is entitled to one response.

To forward a project to Common Council for action, a majority of the eligible households and businesses must respond favorably by ballot. If over 50% if all eligible ballots respond in favor the project, then it will be forwarded tot he Common Council. If, however, less than 50% of all eligible ballots respond in favor of the project, but at least 60% of those returned ballots are in favor of the project, then a second ballot shall be mailed to those addresses that did not respond tot he first ballot. Ballots will be tallied for a period of four weeks from the time of distribution; ballots postmarked after the expiration date of the four-week period will not be tallied.

Step 7. Testing and Evaluation of Traffic Calming Device

A test of the traffic calming plan may occasionally be required to determine its effectiveness. If the Engineering Department and BPSC determine that testing is necessary, temporary traffic calming devices shall be installed for a period of at least one month.

Following the test period, data will be collected to evaluate how well the test device has performed in terms of the previously defined problems and objectives. The evaluation includes the project street and other streets impacted by the project and is based on before-and-after speeds and volumes, impacts on emergency and service vehicles or commercial uses, and other evaluation criteria determined by the BPSC. If the evaluation criteria are not met to the satisfaction of the BPSC and City Engineering staff, the traffic plan may be modified and additional testing conducted. If the test installation does not meet the project objectives, the request will need to go back to Step 5 for additional alternatives and neighborhood ballot.

If the City Engineer finds that an unforeseen hazard exists, the test may at any time be revised or discontinued. City Engineering staff will inform the BPSC and the neighborhood of any actions taken to modify or terminate a test.

When testing of traffic calming or traffic control devices is not possible or necessary, the plan will proceed to Step 8.

Step 8. Common Council Action

Based on the project evaluation and a positive ballot, City staff members prepare a report and recommendations for the Bicycle and Pedestrian Safety Commission to forward to the Common Council for action. The report outlines the process followed, includes the project findings, and states the reasons for the recommendations.

If a project does not obtain the required ballot approval, it is not forwarded to the Common Council.

Step 9. Board of Public Works

After the project has been approved by the Common Council, detailed project plans, specifications and estimates will be prepared by City Engineering staff.

Before the project(s) can be constructed by the City's Street Department or let for bidding by construction companies, the project plans and construction fund expenditures must be approved by the Board of Public Works.

If a project is not approved, it will be referred back to the Engineering staff to address the Board's concerns.

Step 10. Construct Permanent Traffic Calming Device(s)

Construction is administered by the City and is generally completed during the following construction season.

Step 11. Maintenance

The City of Bloomington Engineering and Street Departments are responsible for the construction and maintenance of any traffic calming device implemented as part of this program. The Traffic Division is responsible for any traffic signing and pavement marking or delineation. Any trees planted within the right-of-way are the responsibility of the Parks and Recreation Department and any landscaping (not including trees) is the responsibility of the neighborhood association.

Step 12. Follow-up Evaluation

Within six months to one year after construction of an NTSP project, the City may conduct a follow-up evaluation to determine if the project's goals and objectives continue to be met. This evaluation may entail traffic studies of volumes, speeds and accidents as well as public opinion surveys.

APPENDIX A

VISION AND MISSION STATEMENT OF THE CITY OF BLOOMINGTON

MISSION OF CITY GOVERNMENT

- QUALITY DELIVERY OF BASIC SERVICES AND PROGRAMS

  Do well those things that municipal government is uniquely expected and able to do – public safety, streets and roads, parks, etc.

- CONTINUOUS GOVERNMENT IMPROVEMENT

  Develop and implement the management and information systems that allow the determination and evaluation of the best practices and methods for the delivery of services and programs.

- PRESERVE AND ENHANCE COMMUNITY CHARACTER

  Maintain, develop and implement policies that foster those aspects of our community spirit and our civic life that, combined, constitute the cherished quality of life that is uniquely Bloomington's.

A VISION OF COMMUNITY

- A SAFE AND CIVIL CITY
- A PLACE OF BEAUTY
- A CAPITAL OF KNOWLEDGE
- A CULTURAL OASIS
- BIG CITY ADVANTAGES, SMALL TOWN FEEL
- NEIGHBORHOODS AS VILLAGES, CONNECTED TO EACH OTHER AND COMMUNITY
- THE FRIENDLIEST TOWN AROUND
- DIFFERENT FOLKS, DIFFERENT STROKES

CIVIC VALUES

- ABOVE ALL, NO VIOLENCE
- KIDS FIRST
- COMPASSION FOR CITIZENS IN CRISIS
- CHARACTER THROUGH DIVERSITY
- DISCOURSE SHOULD BE CIVIL
- AESTHETICS MATTER
- HEARTS AND SOULS NEED NOURISHED TOO

APPENDIX B

POINT ASSIGNMENT FOR RANKING NTSP REQUESTS

		Point Assigned
1)	Percent of vehicles traveling over the posted speed limit	
	low = 33%	1
	medium = 33 - 67%	2
	high = 68+%	3
	A) Cut through traffic versus within (intra?) neighborhood speeding:	
	Further study? Yes / No	

2)	Average daily traffic volumes		
	Local Service Streets	Neighborhood Collector Streets	
	low = 1 – 599	low = 500 – 1,499	1
	medium = 600 – 1,499	medium = 1,500 – 3,499	2
	high – 1,500+	high = 3,500+	3

3)	Number of accidents along proposed calming area in 3 year period		
	low = 1 – 2		1
	medium = 3 – 4		2
	high = 5+		3

		Yes	No
4)	Creation of pedestrian and bicycle networks		
	school walk route	1	0
	school on proposed traffic calming street	1	0
	designated bicycle route	1	0
	route in or to pedestrian area (e.g., park, shopping, etc.)	1	0
	proposed calming street has NO sidewalks	1	0
	proposed calming area has NO bike lanes	1	0
	within walking distance to transit	1	0
5)	Scheduled road construction/reconstruction in proposed calming area	2	0

TOTAL POINTS: _____

Priority rank:

Comments and recommendations:

Calculated points are summed and competing projects' point totals are compared. The project with t he greater point total moves ahead of those projects with less total points.

APPENDIX C

TRAFFIC CALMING DEVICES

Traffic calming relies upon physical changes to streets to slow motor vehicles or to reduce traffic volumes. These changes are designed to affect drivers' perceptions of the street and to influence driver behavior in a manner that is self-enforcing. Unlike traditional methods of traffic management, traffic calming does not rely primarily upon the threat of police enforcement for its effectiveness. Items which may be considered as traffic calming devices and which may be applied in a NTSP project are shown in Table 2.

1. Street and Lane Narrowing

Motorists tend to drive at speeds they consider safe and reasonable and tend to drive more slowly on narrower roads and traffic lanes than wider ones. Reducing road widths by widening boulevards or sidewalks intermittently or introducing medians can reduce traffic speeds. The judicious placement of parking (protected by curbs and made more visible by landscaping) can achieve the same effect. Road narrowing has the added advantage of reducing the expanse of road to be crossed by pedestrians, thus reducing pedestrian crossing time.

Other criteria to be applied and considered prior to street narrowing include:

Bicycle Accommodations: On local streets designated as a bike route or serving a significant volume of bicycle traffic, a sufficiently wide bicycle lane should be provided through the narrowed area. Where traffic and /or bicycle volumes are sufficiently low, exclusive bicycle lanes may not be required.

Snow Removal: The pavement width of streets shall not be narrowed to a point where it becomes an impediment to snow removal.

Parking Restrictions: In most cases on local access streets, street narrowing will require the prohibition of parking at all times along the street curb the full length of the narrowed section plus 20 feet.

Landscaping: Median landscaping can be selected by neighborhood associations from an approved landscaping materials list provided by the City. Landscaping will be provided and installed by the City and will be maintained by the neighborhood association or landscape volunteer. If the landscaping is not maintained, the median will be topped with concrete or asphalt pavement.

Median Width/Lane Width: Where medians are used to narrow streets, the medians shall not be constructed at less than four feet in width. Travel lanes shall not be narrowed to a width less than nine feet, exclusive of gutter. Bicycle lanes where required shall be four feet wide exclusive of gutter, unless the gutter is poured integral to the bicycle lane, in which case the bicycle lane will be five feet wide. If parking is allowed, the parking and bicycle lane combination shall be a minimum of 13 feet.

2. Bicycle Lanes

Lane widths available to motorists can be reduced on some streets by the installation of bicycle lanes, either next to the curb (preventing stopping or parking by motor vehicles or adjacent to parking. The space needed for bicycle lanes introduced on an existing street may reduce the width or number of general traffic lanes or the amount of parking. Bicycle lanes shall be constructed to the standard specifications of the Bloomington Public Works Department.

3. Raised Street Sections or Speed Humps

Raised street sections or speed humps can reduce vehicle speeds on local streets. The hump is a raised area, no greater than 3 inches high, extending transversely across the street. For local streets, speed humps typically are constructed with a longitudinal length of 12 feet. If speed humps are determined to be appropriate for neighborhood collector streets, they shall be constructed with a longitudinal length of 22 feet. These longer speed humps may also be considered on local service streets that serve as primary emergency response routes.

Other criteria to be applied prior to installation of speed humps include:

- Signing/Marking: Speed humps are required to be signed with a combination of signs and pavement marking to ward motorists and bicyclists of their presence.

- Traffic Safety and Diversion: Any use of speed humps must take into consideration the impact the installation will have on long-wheel-based vehicles (fire apparatus, ambulances, snow plows and garbage trucks) and the potential to divert traffic to other adjacent streets. Speed humps should only be installed to address documented safety problems or traffic concerns supported by traffic engineering studies.

- Street Width: Speed humps should be used on streets with no more than two travel lanes and less than or equal to 40 feet in width. In addition, the pavement should have good surface and drainage qualities.

- Street Grade: Speed humps should only be considered on streets with grades of 8% or less approaching the hump.

- Street Alignment: Speed humps should not be placed within severe horizontal or vertical curves that might result in substantial horizontal or vertical forces on a vehicle traversing the hump. Humps should be avoided within horizontal curves of less than 300 feet centerline radius and on vertical curves with less than the minimum safe stopping sight distance. If possible, humps should be located on tangent rather than curve sections.

- Sight Distance: Speed humps should generally be installed only where the minimum safe stopping sight distance (as defined in AASHTO's *A Policy on Geometric Design of Streets*) can be provided.

- Traffic Speeds: Speed humps should generally be installed only on streets where the posted or prima facie speed limit is 30 mph or less. Speed humps should be carefully considered on streets where the 85th percentile speed is in excess of 40 mph.

- Traffic Volumes: Speed humps should typically be installed only on streets with 3,000 vehicles per day or less. If considered for streets with higher volume, their use should receive special evaluation.

- Emergency Vehicle Access: Speed humps should not be installed on streets that are defined or used as primary emergency vehicle access routes. If humps are considered on these routes, special care must be taken to ensure reasonable access is provided.

- Transit Routes: Speed humps should generally not be installed along streets with established transit routes. If humps are installed on transit routes, their design should consider the special operational characteristics of these vehicles.

4. Full or Partial Road Closures (Semi-Diverters/Diverters/Cul-de-sac)

Roads can be closed to motor vehicles at intersections, preventing through movement and requiring access to be gained from other streets. Closure should be undertaken in such a way as to avoid simple displacement of traffic to adjacent residential streets. It will usually be possible and desirable to retain pedestrian and bicycle access.

- Partial intersection closures can be achieved by narrowing a street to one lane at an intersection and instituting an entry restriction. Another technique is to introduce a "diagonal diverter" or barrier diagonally across an intersection which forces traffic off favored short-cut. Gaps can be left to allow access by pedestrians and bicycles.

- Partial Closures: Partial roadway closures at intersections will require consideration of pedestrian and bicycle access and lane width requirements similar to those defined under Street and Lane Narrowing.

5. Chicanes

Chicanes are a form of curb extension which alternate from one side of the street to the other. The road is in effect narrowed first from one side then the other and finally from the first side again in relatively short succession. Chicanes break up the typically long sight lines along streets and thus combine physical and psychological techniques to reduce speeds.

- Lane Width: Where chicanes are used, the travel lanes shall not be narrowed to a width less than nine feet, exclusive of gutter. Bicycle lanes where required shall be four feet wide exclusive of gutter, unless the gutter is poured integral to the bicycle lane, in which case the bicycle lane will be five feet wide.

- Snow Removal: Chicanes shall be designed to minimize the accumulation of snow piles and trash in the gutter interface between existing curb and gutter and chicane.

- Landscaping: Landscaping will typically consist of grass. Other landscaping may be selected from an approved landscaping list provided by the City. Landscaping may be provided and installed by the City and will be maintained by the neighborhood Association or landscaping volunteer. Landscaping will not be approved which will obstruct the driver's vision of approaching traffic, pedestrians or bicyclists.

6. Traffic Circles

Traffic circles are circles of varying diameter formed by curbs. Motorists must drive around the circle, or in the case of longer vehicles, drivers may drive slowly onto and over a mountable concrete curb forming the circle. Traffic circles reduce motor vehicle speeds through the intersections, depending on current intersection controls in place.

Other criteria to be applied and considered to prior to installation include:

- Design Considerations: For each intersection the size of the circle will vary depending on the circumstances for that specific intersection. In general, the size of the circle will be determined by the geometry o f the intersection.

- Where intersecting streets differ significantly in width, it may be more appropriate to design an elongated "circle" using half circles with tangent sections between them. Smaller circles will be constructed on a case-by-case basis. Normally the circle will be located as close to the middle of the intersection as practical. Under special circumstances, such as being on a Fire Department response route, bus route or due to snow removal accommodations, the size and/or location of the circle will be adjusted to more appropriately meet the special circumstances.

- Design Considerations for "T" type intersections: For "T" type intersections, all of the above design considerations apply. In addition, curb extensions (or curb bulbs) may be included along the top of the "T" at the entrance and exit to the intersection.

- Signage: Appropriate signage for traffic circles will be determined by the City Engineer and may vary based on the location of the circle.

- Channelization: Where curbs do not exist on the corner radii, painted barrier lines, defining the corners, should be installed.

  Yellow retro-reflective lane line markers shall be placed on top of the circle at its outer edge.

- Parking Removal: Normally, parking will not be prohibited in the vicinity of the circle beyond that which is prohibited by the City of Bloomington, i.e., "within the intersection" or "within 20 feet of a crosswalk area". However, where special circumstances dictate, such as where the circle is on a response route for the Fire Department or to accommodate snow removal, or in an area where there is an unusually high use by trucks, additional parking may be prohibited as needed.

- Sign Removal: At intersections where circles are to be installed, any previous right-of-way controls may be removed at the time of circle construction completion. However, where special circumstances dictate, the existing traffic control may remain in place or be otherwise modified at t the direction of the City Engineer.

- Landscaping: Landscaping will be selected by the neighborhood association or the City Parks and Recreation Department from an approved landscaping materials list provided by the City. Landscaping will be provided and

installed by the City and will be maintained by the neighborhood association. If the landscaping is not maintained, the traffic circle will be topped with concrete or asphalt pavement.

Volunteer Required:
Plant Material will only y be installed at traffic circles where a local resident or neighborhood association has volunteered to maintain the plant material. This maintenance will include watering, weeding and litter pick-up, as needed. All volunteers will be provided with information on maintenance of the plant material and common problems.

Points at which volunteers will be required: During initial contact, the person or neighborhood association requesting participation in the NTSP will be informed of the need for a volunteer for landscaping. In the notice of the neighborhood meeting, before construction, all residents will be informed of the need for a maintenance volunteer. This will be reiterated at the meeting if no one has volunteered. If no one has volunteered by the time that the circle is constructed, a special letter will be distributed to all residents informing them of the need for a volunteer (Figure 4). A final notice to residents will be included in the cover letter for the "after" survey of the residents.

Plant Replacement:
Where the Public Works Department has had installed plant material in a traffic circle, the Department will replace any plant material which is damaged by traffic or vandalism or which dies due to planting, for a period of one year after the initial planting. If such damage is a persistent problem, the Department may decide to cover the circle with a concrete or asphalt topping rather then to continue to replace plant material.

7. Stop Signs:

In some instances stop signs can be used as an effective traffic management and safety device. However, stop signs are not used as a traffic claming device within the NTSP.

Stop signs are used to assign right-of-way at an intersection. They are installed at intersections where an accident problem is identified, where unremoveable visibility restrictions exist (such as buildings or topography), and/or where volumes are high enough that the normal right-of-way rule is potentially hazardous.

Stop signs are generally not installed to diver traffic or reduce speeding. Studies from other jurisdictions show that such use of stop signs seldom has the desired effect. In fact, the use of stop signs solely to regulate speed typically causes negative traffic safety impacts (non-compliance with the signs and increased accidents as well as mid-block speeding).