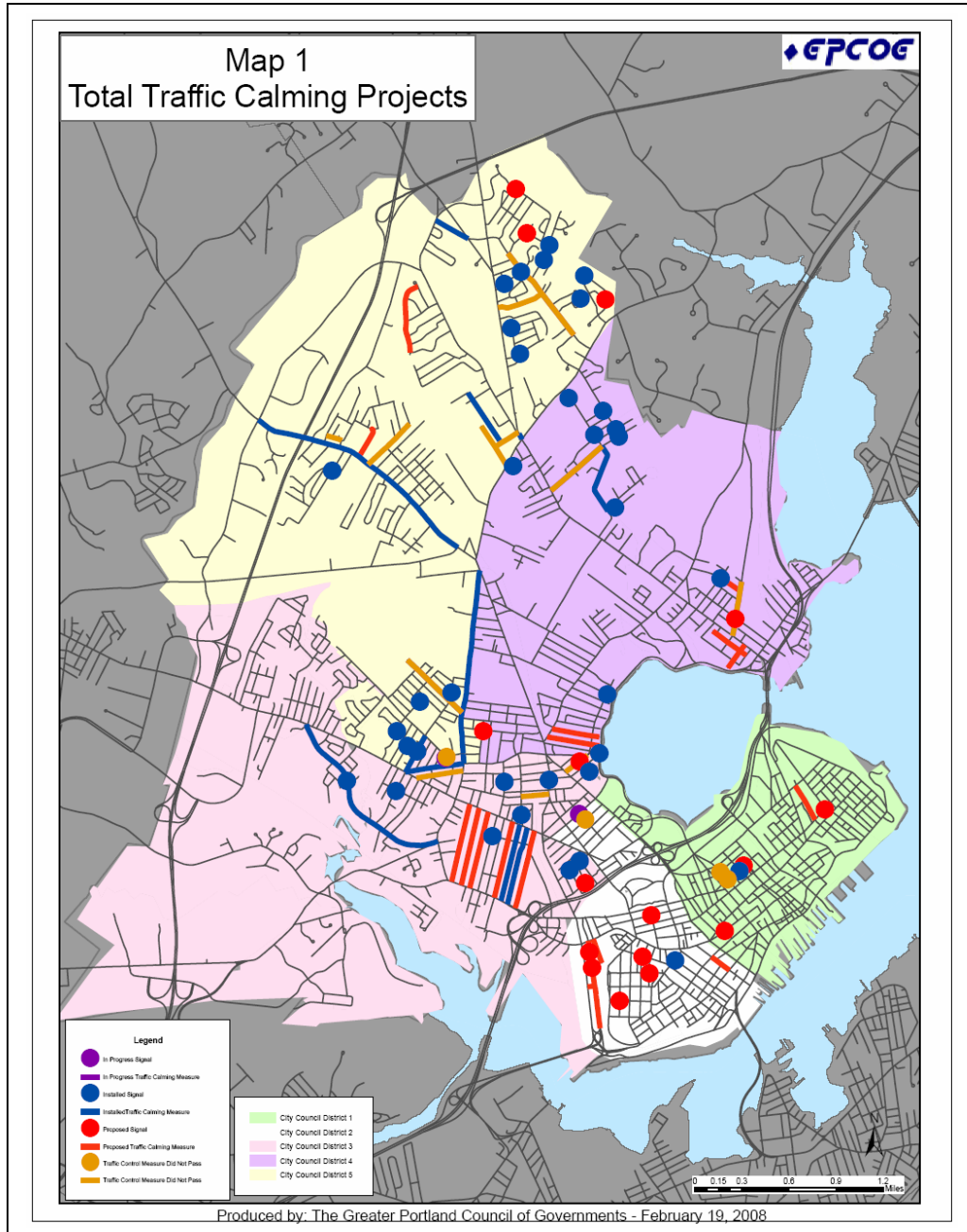


Portland Traffic Calming Report



Greater Portland Council of Governments
May 20, 2008 Final Draft

Portland Traffic Calming Report

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Table of Contents

Executive Summary	4
I. Introduction	5
II. Existing Conditions	7
III. Findings and Recommendations	18
IV. Appendices	19
A. Portland Code of Ordinances, Chapter 28	
B. Existing Conditions Traffic Calming Project Tables	
C. Manual on Uniform Traffic Control Devices (MUTCD) Excerpt	
D. Multi-way Stops Article – W. Martin Bretherton Jr., PE, Feb 2006	
E. Traffic Calming Case Studies	
1. Brooklyn, NY Action Program	
2. Greenville, NC (including Stop Sign Policy)	
3. Chapel Hill, N.C.	
4. Carlsbad, CA	
5. Charlottesville, Virginia	
6. Boulder, CO	

Executive Summary

Introduction

The City of Portland Department of Public Services (DPS) contracted with the Greater Portland Council of Governments (GPCOG) in 2005 to conduct this **Traffic Calming Study** with PACTS funds. The purpose of the study was to evaluate Portland's existing Traffic Calming Ordinance, inventory existing traffic calming conditions, present examples from other cities and make recommendations for improvements.

Existing Conditions

The types of traffic calming devices currently being employed by the City of Portland include (1) speed tables, (2) stop signs, (3) traffic islands, (4) traffic signals, (5) one-way streets (6) raised crosswalks and others. At this writing, there are a total of **97** traffic calming projects, including traffic calming devices installed, projects in progress, streetscapes, stop signs, and projects currently being proposed (see Table 1, below).

Table 1
Traffic Calming Project Status

Project Status	Number
Installed	47
In progress	6
Did not pass	11
Proposed	33
Total Projects	97

Key Findings and Recommendations

1. Introduce a three tier process describing (a) stop sign requests, (b) traffic calming measures and (c) streetscape designs. These are progressively more complicated measures, and the ordinance should reflect this tiered approach.
2. Develop a stop sign policy. In 2005, City Councilors set objectives for DPS to follow regarding the installation of multi-way stop signs. However, a formal policy was not adopted or incorporated into the ordinance.
3. Install traffic calming devices only if they meet the thresholds established in the ordinance and meet MUTCD warrant analysis.

Full recommendations can be found on p. 18.

I. Introduction

The City of Portland Department of Public Services (DPS) contracted with the Greater Portland Council of Governments (GPCOG) in 2005 to conduct a **Traffic Calming Study** with PACTS funds. The purpose of the study was to evaluate Portland's existing Traffic Calming Ordinance, inventory existing traffic calming conditions, present examples from other cities and make recommendations for improvements.

A. Planning Process

GPCOG staff met with the Department Public Services (DPS) staff in June 2005 and completed an inventory to document the total number of traffic calming projects either installed or proposed. What began as 59 projects in June 2005 increased to 97 projects by February 2008. Staff also conducted a review of case studies to compare Portland with other U.S. Cities. Tom Errico provided engineering expertise during the project. GPCOG also presented preliminary findings of existing conditions at the July 2005 and November 2007 Portland Transportation Committee Meetings. Draft reports were presented in Mar 2006, Nov 2007, Feb 2008, with the final report proposed for completion in May 2008.

B. Traffic Calming Overview

Currently, most Portland traffic calming projects are subject to a petition process, in which residents must first present a petition to request a project. DPS staff evaluates each project to determine if certain criteria are met before issuing a determination of finding. Some projects do not pass this test and are not considered further. Other projects passed the engineering tests and were subsequently installed.

Portland's Traffic Calming ordinance is contained in the Portland Code of Ordinances in Chapter 28.



Raised Intersection at Stevens and Pleasant

The purpose of Title VI in Chapter 28 "Traffic and Motor Vehicles" of the Portland Code of Ordinances is "to set forth a specific procedure and methodology for citizen or council requested traffic calming plans. . ." There are also portions of the ordinance dedicated to the selection of traffic calming devices, monitoring and evaluating their effectiveness. In short, this approach allows citizens to petition for this specific type of street design.

This process of evaluating traffic calming requests was delayed over several years because of changes in staffing. Portland Traffic Engineer Larry Ash died suddenly in 2002, and the Public Services Department had to rely on contract engineering staff for several years before another traffic engineer was finally hired. During this time period, many traffic calming projects were delayed.

Installing a traffic calming device is one of the many tools available to engineers and planners to address such problems as speeding or cutting through residential neighborhoods. Traffic calming is one way to re-design a street to force motorists slow down or take a different route. In some cities, other transportation improvements can be initiated by the public. In Brooklyn, NY, for example, citizens can request a type of pedestrian refuge island, a bus stop, or an improved sidewalk in addition to a traffic calming device.¹



to

Some residents install their own “SLOW” signs

Lessons Learned from Stevens Avenue

One of Portland’s most controversial set of projects was installed along Steven’s Avenue in 1997. Initially, numerous traffic calming devices were proposed, including a serpentine shift in the roadway (to slow traffic), curb extensions to define on-street parking and to define turning movements, raised crosswalks, speed platforms, and one raised intersection. After vocal and visible protests by neighbors and concerned citizens, DPS removed all of the devices except the six raised crosswalks and raised platforms.

Proponents of the Stevens Avenue Traffic Calming experiment contend vehicle speeds and incidents between pedestrians and vehicles have been reduced since the devices were installed.²

Opponents contend vehicle speeds have not changed but just become erratic, emergency vehicle response times have increased, and air quality mitigation funds used to design and construct the raised speed platforms were not justified.

Regardless of the outcome, City Officials created the Portland Traffic Calming Ordinance in response to the Stevens Avenue Traffic Calming Project to avoid future situations in which there was mixed neighborhood support for such a project.

¹ City of Brooklyn, NY: Traffic Management Themes.

² Stevens Avenue Traffic Monitoring Report, DeLucca Hoffman, 1999.

II. Existing Conditions

The types of traffic calming devices employed by the City of Portland include (1) speed tables, (2) stop signs, (3) traffic islands, (4) traffic signals, (5) one-way streets, and (6) raised crosswalks. Recent efforts to develop “streetscape” projects sometimes contain traffic calming elements as part of the streetscape design. Businesses and citizens have employed other measures, including “no access” signs and chains, “slow down” signs and “children playing” signs. Traffic calming measures are usually implemented to slow traffic, prevent or reduce cut-through traffic, and improve safety conditions in neighborhoods.

Since the development of the Traffic Calming Ordinance, DPS has taken a more holistic approach to traffic calming measures in the context of requests for “streetscape” improvements. Examples include Woodford Street, Auburn Street, and Allen Avenue Extension. Elements of “streetscape” improvements include bicycle lanes, sidewalks, street plantings, and the introduction of traffic islands at key intersections.

In Chapter 28 “Traffic and Motor Vehicles” of the Portland Code of Ordinances, or “the traffic calming ordinance,” citizens can request traffic calming measures for their neighborhood if they produce a petition with signatures from more than 2/3 of residents. The Public Works Department (DPS) reviews petition requests, conducts traffic analysis studies to determine if devices meet certain criteria, then installs devices as funding and time allows.

There are many types of traffic calming devices being tested and installed in other areas of the country and around the world. In Appendix C, see case studies and more information on traffic calming, street designs, streetscapes, neighborhood designs and other urban planning resources.

A. Traffic Calming Projects by Type

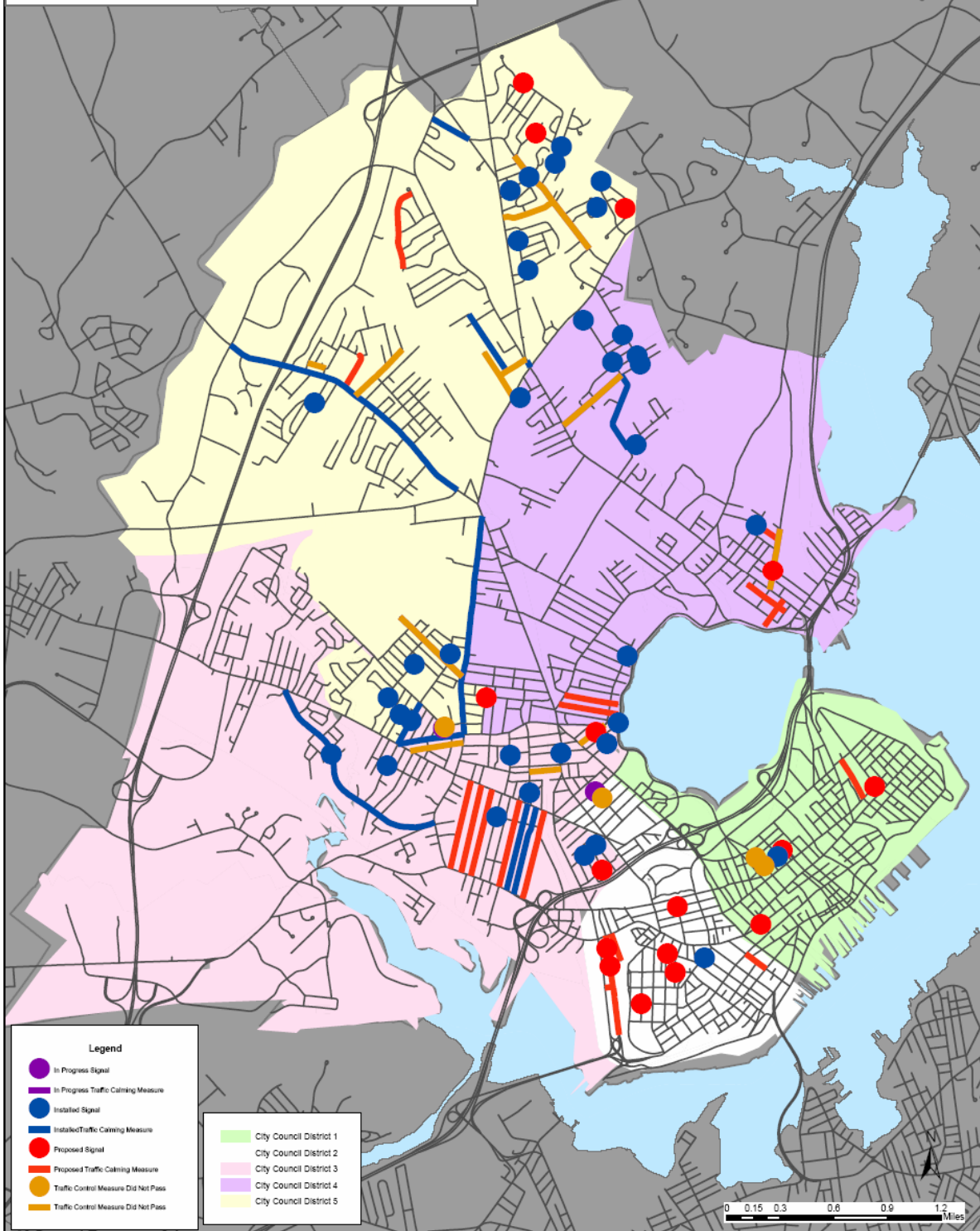
At this writing, there are a total of 97 traffic calming projects, including traffic calming devices installed, projects in progress, streetscapes, stop signs, projects submitted but did not pass, projects that were installed using the Stop Sign Policy, and projects currently being proposed (see Table 1, below).

Table 1
Traffic Calming Project Status

Project Status	Number
Installed	47
In progress	6
Did not pass	11
Proposed	33
Total Projects	97

A complete list of all 97 Traffic Calming Projects can be found in Appendix B.

Map 1 Total Traffic Calming Projects



Produced by: The Greater Portland Council of Governments - February 19, 2008

Some projects are incorporated into the city's streetscape design process, which may include changes to the street width, medians, pedestrian refuge islands, signage and other roadway improvements.

Stop Sign Installation Procedures

During 2005, City Councilors set objectives for DPS to follow regarding the installation of multi-way stop signs. The objectives allow city councilors to request multi-way stop signs provided DPS staff evaluates traffic conditions, crash history and other factors. The proposed stop sign may be installed as long as DPS has addressed any potential safety concerns at that location. This procedure was developed to streamline the petition process for stop sign installations only.

1. Installed Projects

There have been 19 projects installed over the past 10 years, including 20 raised speed tables, more than 10 stop signs, one traffic signal, one flashing beacon (later removed), raised islands, and on-street parking. During the past six months, 20 more stop signs were installed through a new councilor-initiated process, resulting in a total of 39 projects installed. Nearly all of the stops sign projects have been installed on local streets to discourage neighborhood cut-through traffic and reduce vehicle speeds. Since these devices were installed, one councilor reported the number of calls from citizens regarding cut-through traffic and speeding has been reduced.

The speed platforms measure between 15 and 22 feet in length and in most cases extend across all but the last two feet on either side of the roadway. The sloping sections of the platform are striped yellow. Some platforms, such as those on Steven's Avenue, are designed as part of a raised crosswalk (see right).

One traffic signal was installed at Baxter and Vannah as part of a comprehensive Traffic Calming Study.

A 4-way flashing beacon was installed in addition to stop signs on Deering Avenue at Coyle Street through the petition process. The same neighbors who petitioned to have this signal installed later petitioned to have the signal removed. The beacon was subsequently removed in October 2005.



Raised Platform w/Crosswalk on Stevens Avenue at Longfellow Elementary School (Willauer)

Table 2
Installed Traffic Calming Projects

#	Project	Description	Dist	Device
1	Bartley	Bartley @ Junior	5	Stop sign
2	Baxter/Vannah	intersection	4	traffic signal
3	Beacon	at Orland St		
4	Belmont St.	Belmont and Melrose	3	stop sign
5	Bolton St	Entire length	3	3 speed tables installed
6	Capisic St	Entire length	3	3 speed tables - circles
7	Chestnut	Chestnut and Oxford	1	Stop sign
8	Clifton St	at St. George		Stop sign
9	Colonial Rd	Entire length	3	stop signs
10	Columbia Rd	Entire length	3	small islands, stops signs
11	Curtis Rd	Entire length	5	stop signs
12	Curtis Rd	at Abbey	5	stop sign
13	Deepwood Dr.	Deepwood at R. Brook	5	Stop sign
14	Deering Ave	Deering @ Coyle	3	4-way flasher installed, removed
15	East Kidder	East Kidder @ Provid	4	Stop sign
16	Edgeworth	at Leeman	5	Stop sign at Leeman
17	Edwards St.	at Elizabeth	3	Stop sign at Elizabeth
18	Emery St.	Pine to Spring	2	Added on-street parking
19	Falmouth St.	Falmouth @ Exeter	3	stop signs
20	Falmouth St.	Falmouth @ Payson	3	stop signs
21	Forest Avenue	Warren to Riverside In.		Streetscape, bike lanes, islands
22	Hennessy	Entire length	5	3 speed tables, 2 remain
23	Highland St.	Fairmont to Prospect	3	stop signs at one intersection
24	Jackson St.	Entire length	5	stop signs and circle
25	Jeanne St	at Wingate Dr		Stop sign
26	Knight Street	Maplewood @ Knight	4	Stop sign
27	Lane	Lane and Pari Place	5	Stop sign
28	Leland	Leland and Richardson	5	Stop sign
29	Little Rd	Little and Starbird	3	Stop Sign
30	Madeline	Madeline and Fuller	5	Stop sign
31	Maine Ave.	Maine and Virginia	4	Stop sign
32	Marlborough	Marlborough @ Ivaloo	4	3-way stop installed via policy*
33	Mass Ave.	Entire length	3	3 speed tables installed
34	Pine St.	at Winter St.		stop sign
35	Pineloch Dr.	Pineloch & Heather	5	stop signs
36	Ray St	Ray @ Merrymeeting	4	stop signs
37	Ray St.	Maine to Ivaloo	4	speed tables installed
38	Ray St.	Ray @ Penn	4	stop signs
39	Rustic Ln	Rustic @ Fall	5	Stop sign, petition 4/19/02

Table 2, continued
Installed Traffic Calming Projects

#	Project	Description	Dist	Device
40	Stevens	Forest to Woodford	5	6 speed tables installed
41	Summit St.	Washington-Lambert	5	temporary island installed
42	Summit St.	at Jackson St	5	stop sign installed
43	Virginia	Virginia @ Nevada	4	Stop sign request
44	Virginia	Virginia @ Penn Ave	4	Stop sign request
45	Washington	Allen's Corner - R-side	5	Raised islands
46	Westminster	Westminster-Leeman	5	Stop sign request
47	Woodford St*.	Brighton and Stevens	3	reconstruction, narrowing

* Note Woodford Street was re-designed as part of a roadway improvement project.

Some of the projects were installed through the “streetscape” process to improve roadway design, including parking, landscaping, and other treatments. Examples include Woodford Street, Washington Avenue and Allen Avenue Extension.

A total of six projects include the installation of speed tables. These are often constructed with a raised crosswalk (such as on Capisic Street (right)).

Most projects included placement of stops signs. One traffic signal was installed at Vannah and Baxter as part of a comprehensive traffic study. A four-way beacon was installed at Deering and Coyle and later removed.

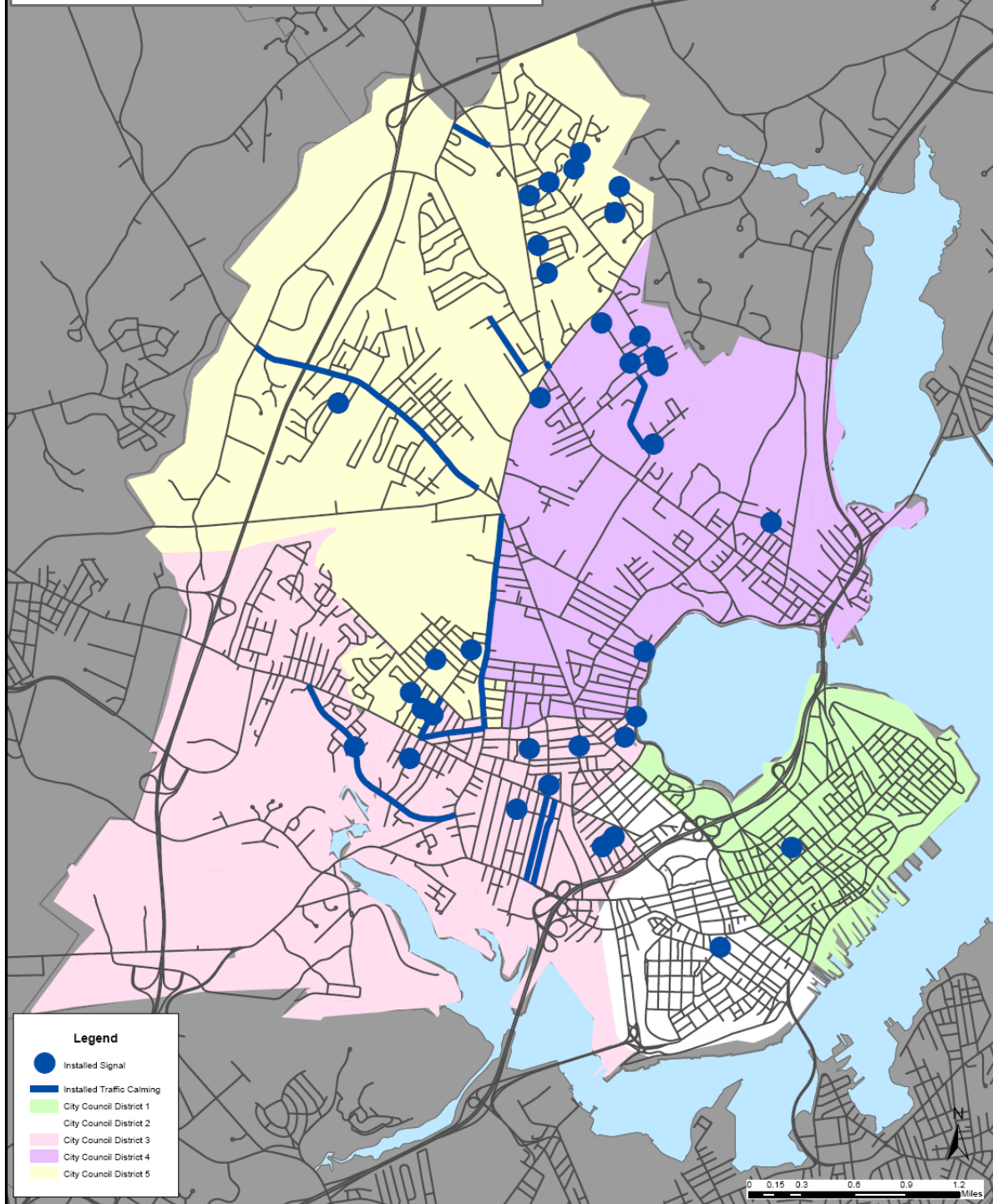
From the map on the next page, most of the projects are located between principal arterial avenues, such as between Congress and Brighton Avenues, and between Brighton and Forest Avenues. This is occurring due to the nature of peak commuter traffic patterns. As commuters try to avoid peak hour congestion, they travel on local streets to reach nearby arterials.



*Speed platforms on Capisic Street
(Willauer)*

One result is citizens are requesting more streets between Brighton Avenue and Congress Street be candidates for speed platforms. Second, new projects are being proposed on the Portland peninsula in District 1. Third, more projects are being requested between Washington Avenue and Presumpscot Street, and between Washington Avenue and Baxter Boulevard. These patterns confirm the fact that residents are using local streets to create shortcuts between principal arterial roadways.

Map 2 Traffic Calming Devices Installed



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2. Projects In-Progress

As of this writing, six projects are in progress, including a four-way stop sign, a speed table, and projects being completed as part of the streetscape process. See Table 3, below, and Map 3 of Projects in Progress on the next page.

Table 3
Projects In-Progress

#	Project	Description	Dist	Device
1	Brentwood St	Entire length	5	none
2	Dartmouth St.	At Oakdale	3	4-way stop proposed
3	Ludlow St.	Ludlow @ Marlow	5	Stop Sign
4	Maine Ave.8	Washington to Ray	4	speed tables proposed
5	Presumpscot	Washington to True	4	streetscapes completed
6	Summit St.	Bramblewood to Abby	5	concept plan in progress

* Note: Maine Avenue started as a traffic calming project from a petition process and was turned into a streetscape project in which more street improvements were made.

3. Projects That Did Not Pass

After citizens submit a petition for traffic calming, DPS staff conducts an engineering assessment to determine whether or not the proposed project will meet certain engineering standards as described in the ordinance. To date, 11 projects have not passed this test and have not been installed. Table 4, below, lists the 11 projects that did not pass to date.

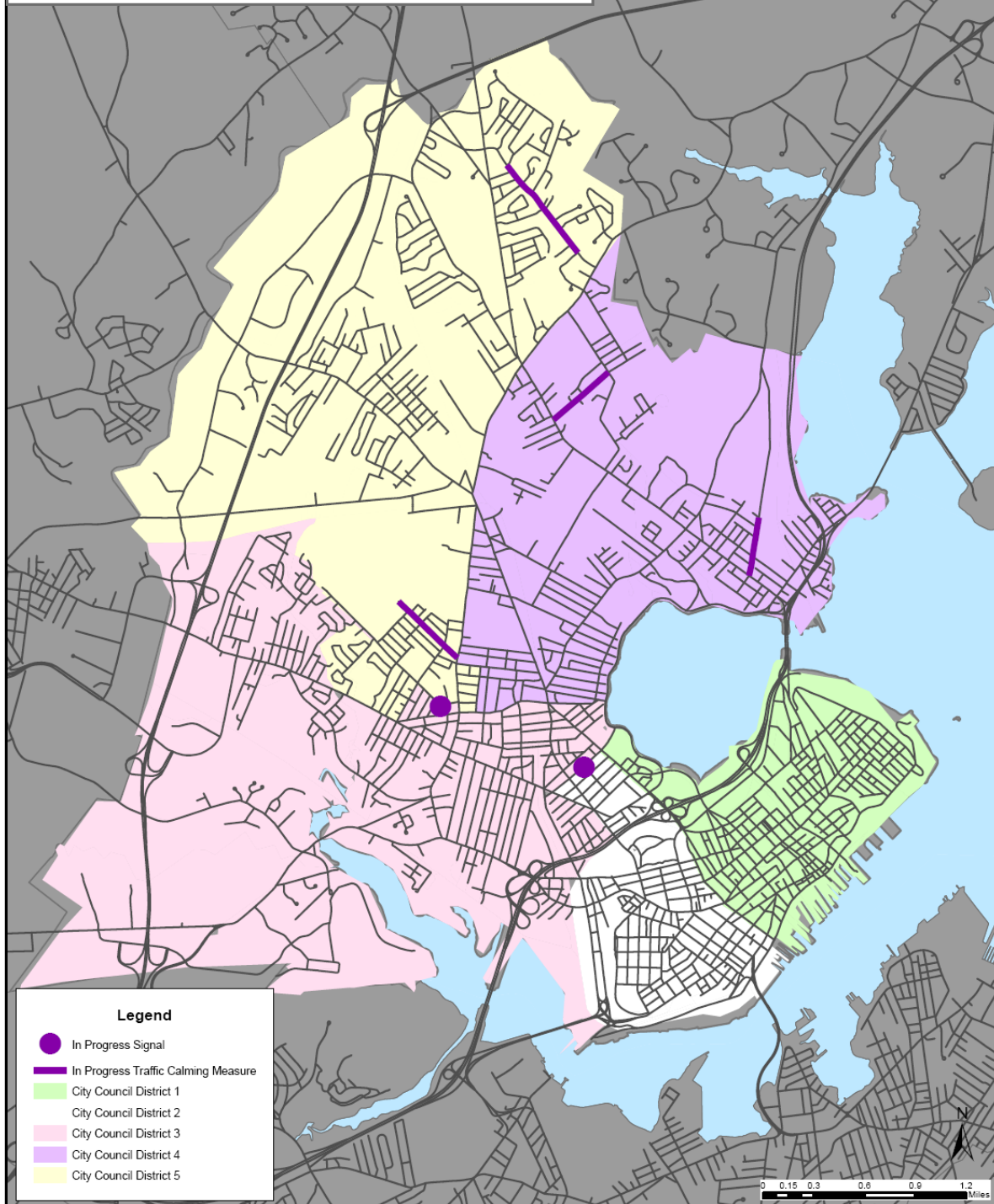
Table 4
Traffic Calming Projects that Did Not Pass

#	Project	Description	Dist	Device
1	Alpine Rd	Entire length	5	none
2	Clifton St	Vannah to Forest	3	none
3	Cypress St	Entire length	5	none
4	Eastman Ave	Entire length	5	none
5	Elm	Elm and Oxford	1	Stop sign request
6	Elm	Elm and Lancaster	1	Stop sign request, signal?
7	Montrose Ave.	Entire length	3	none
8	Newton	Entire length	5	none
9	Pennell Ave.	Entire length	5	none
10	Prospect St.	Deering to Beacon	3	none
11	Stone	Entire length	1	none

The thresholds for determining eligible projects in Portland, ME include traffic volume (vehicles/day), speed (85th percentile speed of vehicles traveling at the posted speed limit), residential density (75-100%), truck volume (six axle trucks or larger), the presence of a school on the street, accident history, the number of children under 12 years old living on the street, and, for traffic control devices, MUTCD warrant analysis. DPS staff scores each proposal using a point system to determine eligibility.³

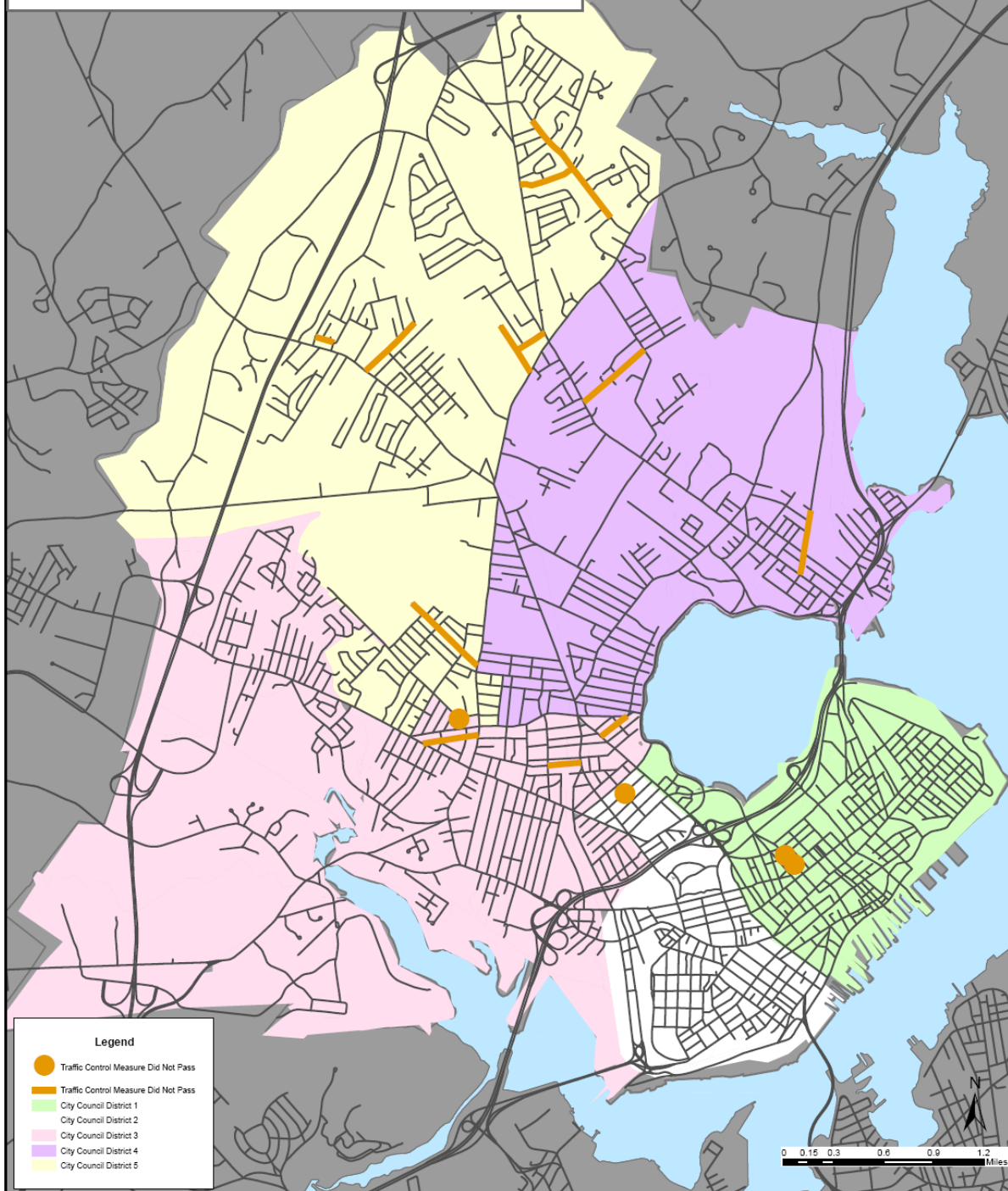
³ Portland Code of Ordinances, Chapter 28, Section 28-2.

Map 3 Traffic Calming Projects In Progress



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Map 4 Traffic Calming Proposed Projects Did Not Pass



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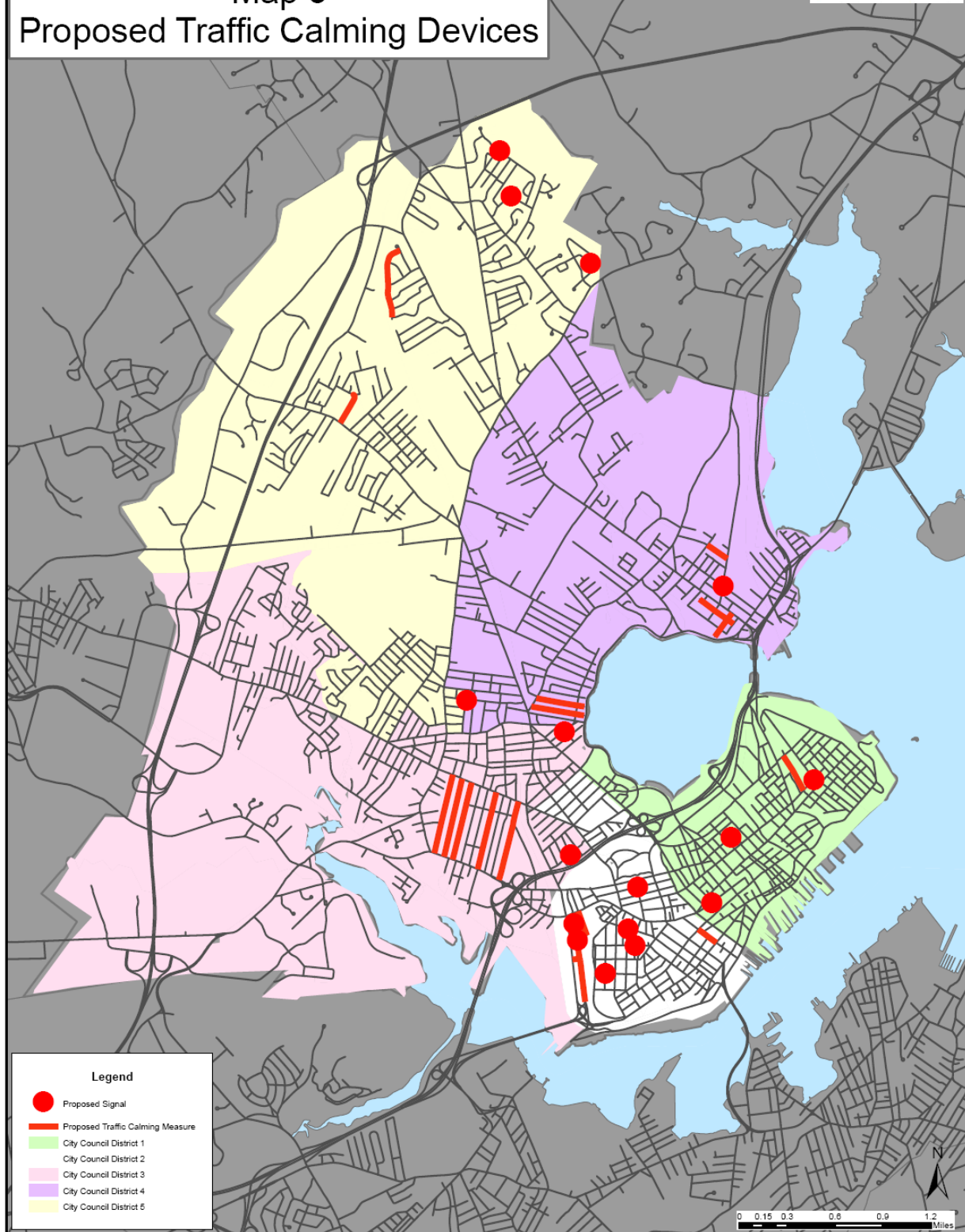
5. Proposed Projects

At this writing, a total of 33 traffic calming projects have not been reviewed and are still considered proposed. Most of these are stop sign requests. See Table 6, below and Map 6 on the following page:

Table 6
Proposed Traffic Calming Projects

#	Project	Description	Dist	Device
1	Abby Ln	at Pamel Rd	5	Stop sign request
2	Alice St	at Hope Ave		Stop sign request
3	Brackett St.	Brackett and Neal	3	Stop sign request, petition 2004
4	Bradley		3	Congress to Brighton
5	Caleb St.		3	Traffic calming
6	Chadwick	Chadwick & Carroll	2	Stop sign request
7	Codman	study done	4	study done 1999 Gorrill Palmer
8	Concord	Concord and Lawn Ave	4	Stop sign request
9	Craigie	Traffic Calming	3	Petition for traffic calming
10	Cumberland Ave	at North St.	1	Stop sign
11	Deepwood Dr.	at Pineloch Dr	5	Stop Sign
12	Douglas	St. James to West Sch	3	Petition for traffic calming
13	Frances St.	Congress and Brighton	3	
14	Free St.	Free @ Oak	1	Stop sign request
15	Gilman St	Congress to MMC	2	Traffic calming
16	Granite	Granite @ Deane	3	Stop sign request
17	Hersey St.		4	speed bumps proposed
18	Illsley St.		4	Entire length
19	Mellen	at Grant St.		Stop sign
20	Oxford St.	Oxford @ Stone	1	Stop sign request
21	Palmer Ave	Allison to Shepherd	5	none
22	Park St.	Spring to Danforth	2	
23	Providence	Lower E. Kidder to Pres	4	Traffic calming
24	Randall St.	Entire length	4	none
25	Sheridan St.	Walnut-Cumberland	1	
26	Sherwood St.	Ocean to Presumpscot	4	4-way stops proposed
27	Stuart St.	Entire length	5	none
28	Valley St	at "A" St	2	counselor request
29	Valley St.	at "C" St	2	counselor request
30	Valley St.	Valley and "D" Street	2	On hold
31	West St.	at Carleton St		Stop sign request
32	Whitney Ave	Entire length	3	speed tables requested
33	Woodford	Woodford @ Melrose	3	Stop sign request

Map 5 Proposed Traffic Calming Devices



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III. Findings and Recommendations

A total of 97 projects have been either installed or proposed in Portland and they represent primarily multi-way stop signs and speed platforms. The following findings and recommendations are intended to address this growing problem of traffic control, roadway design and the overall traffic calming process. The Portland traffic calming ordinance was developed to ensure strong citizen support for, and the thorough planning of, traffic calming measures.



1. Introduce a three tier process describing (a) stop sign requests, (b) traffic calming measures and (c) streetscape designs. These are progressively more complicated measures, and the ordinance should reflect this tiered approach.
2. Develop a stop sign policy. In 2005, City Councilors set objectives for DPS to follow regarding the installation of multi-way stop signs. However, a formal policy was not adopted or incorporated into the ordinance.
3. Install traffic calming devices only if they meet the thresholds established in the ordinance and meet MUTCD warrant analysis.
4. Incorporate traffic calming elements into roadways undergoing the “streetscape” process such as during reconstruction or replacement of water and sewer. Examples of this approach include Woodfords Street and Auburn Street.
5. Publish a compendium of *Traffic Calming Best Practices* and post on the City Web Site or provide links to traffic calming resources on line to educate citizens and to illustrate different types of traffic calming measures.
6. Remove principal arterials and minor arterials as eligible roadways for traffic calming.⁴ Best practices suggest traffic calming measures only are considered for local and collector roadways.
7. Crash history is referenced as part of the traffic calming analysis on p.22 of the Code of Ordinances, but not referenced as part of the thresholds for a traffic calming plan on p.27.
8. Update the *Portland Transportation Plan* to include a section on traffic calming.

⁴ Note: Capasic St. was recently re-classified as a minor arterial – this should be re-evaluated with MaineDOT.

9. Conduct an annual traffic calming review to increase public awareness and ensure new projects are consistent with the *Portland Transportation Plan*.
10. Coordinate traffic calming projects with other transportation improvements, including sidewalks, traffic signals, streetscapes and bus stops.

Appendix A

City of Portland
Code of Ordinances
Sec. 28-2

Traffic and Motor Vehicles
Chapter 28
Rev. 2-17-05

ARTICLE VI. TRAFFIC CALMING.

Sec. 28-250. Statement of Purpose.

The purpose of this Ordinance is to set forth a specific procedure and methodology for: citizen or council requested traffic calming plans; determining that a problem exists and the need for traffic calming devices to solve it; selecting the proper device or devices to correct the problem; and monitoring the effectiveness and impact of installed devices on traffic on both the subject street and abutting streets. The Ordinance shall be interpreted and applied in a manner that is consistent with the City of Portland's Transportation Plan.
(Ord. No. 234-99, 3-29-99)

Sec. 28-251. Definitions.

(a) "City Manager" means the City Manager or the Manager's designee.

(b) "Public Works Director" means the Public Works Director or the Director's designee.

(c) "Street" means a city-accepted street or a portion of such a street.

(d) "Resident" means a person at least 18 years of age who lives in a dwelling unit that is the person's principle place of living or home.
(Ord. No. 234-99, 3-29-99)

Sec. 28-252. Petition or request for determination of preliminary eligibility.

(a) Petition procedure. Any ten or more residents or business owners on a specific City street may file a petition with the City Clerk on a form supplied by the Clerk a petition stating:

- (1) That the signers are at least 18 years of age and residents or business owners on the specific street;
- (2) The printed names and addresses of the person signing the petition and the person's signature;
- (3) The address and name of the individual to whom all notices or

correspondence to the petitioners are to be sent;

- (4) That the signators of the petition seek a determination of preliminary eligibility for traffic calming from the City's Traffic Engineer for a specified street.

(b) Forwarding of Petition. Copies of the petition shall be sent forthwith by the Clerk to the City's Traffic Engineer and to each member of the City Council.

- (c) Councilor Initiated Process. Any City Councilor may file a written request with the Clerk seeking a determination of preliminary eligibility from the City's Traffic Engineer for a specified street. That request will initiate the process for the determination of preliminary eligibility of such street. Copies of the request shall be sent forthwith by the Clerk to the City's Traffic Engineer and to each member of the City Council. The request may designate a person or persons to whom notices or decisions shall be sent that would otherwise be sent to petitioners. In the absence of such a designation, all such notices or decisions shall be sent to the Councilor.

(Ord. No. 234-99, 3-29-99; Ord. No.198-03/04, 6-7-04)

Sec. 28-253. Action by City Traffic Engineer upon receipt of petition or request seeking determination of preliminary eligibility.

(a) Upon receipt of a petition from the Clerk or a written request from a Councilor, the Traffic Engineer shall determine whether the street is in a category identified in Sec. 28-264 as eligible for traffic calming.

(b) If the street is in a category eligible for traffic calming, pursuant to paragraph (a), the Traffic Engineer shall send a written inquiry to the Chief of Police, the Chief of the Fire Department, the Director of MEDCU, and the Director of Public Works asking whether there are public safety or convenience factors which render the petitioned street inappropriate for traffic calming.

(c) The Traffic Engineer shall make a determination as to whether the street is eligible for traffic calming. As part of the analysis, the Traffic Engineer shall consider the speed, volume, and accident history of the street. A Street shall be deemed eligible for traffic calming if it is in a category for which traffic calming is appropriate as identified in Sec. 28-265 and the designated departments conclude that traffic calming could take place in a manner consistent with public safety and convenience.

(d) The Traffic Engineer shall notify the petitioners in writing sent by regular mail, whether the street is eligible or ineligible for traffic calming within forty-five (45) days of receiving the petition from the City Clerk. If the street is ineligible, the decision must state the reasons for the determination. A copy of such notice shall be provided to each Councilor residing within the district where the street is located.

(Ord. No. 234-99, 3-29-99; Ord. No. 198-03/04, 6-7-04)

Sec. 28-254. Appeal of decision of ineligibility following petition for determination of preliminary eligibility.

(a) If the determination by the Traffic Engineer under Section 28-253(c) is that the street is ineligible because the street is not in a category that is eligible for traffic calming, the determination may not be appealed.

(b) If the street is determined ineligible by the Traffic Engineer under section 28-253(c) due to public safety or convenience factors identified by one or more of the officials designated to review the petition, the petitioners may appeal the decision to the City Manager or designee within twenty (20) days of the date upon which the decision is mailed to the petitioners under section 28-253(d). Any such appeal must be in writing and must state the grounds upon which the appealing petitioners disagree with the public safety or convenience determination. The City Manager or designee shall hold a hearing within ten (10) business days of receiving the written appeal and shall issue a written decision within twenty (20) days of the hearing unless either time period is extended by agreement. In the event the City Manager or designee overturns a decision on ineligibility for traffic calming, a street shall be deemed eligible for traffic calming. The decision of the Manager or the Manager's designee may not be appealed to court.

For the purpose of this ordinance, "convenience factors" means factors that would adversely affect the ability of the traveling public to use a street, would interfere with construction or maintenance activities on the street, or would divert an unreasonable amount of traffic to other streets. (Ord. No. 234-99, 3-29-99; Ord. No. 198-03/04, 6-7-04)

Sec. 28-255. Development of traffic calming plan.

Within forty-five (45) days after a final determination that a petitioned street is eligible for traffic calming, the Traffic Engineer will develop a proposed traffic calming plan for the particular street which may integrate several traffic calming methods and options as set forth in section 28-265(b). In developing a plan, the Traffic Engineer shall consider the potential for traffic diversion and other possible impacts on the broader neighborhood in which the street is located, as well as other related public safety and convenience factors that may result from particular traffic calming measures. The Traffic Engineer will submit the proposed traffic calming plan and any options in writing to the Director of Public Works, and any Councilor residing in the district of such street, for review and comment prior to issuing a final traffic calming plan. (Ord. No. 198-03/04, 6-7-04)

Sec. 28-256. Neighborhood Meeting

The Traffic Engineer will hold a public hearing in or near the neighborhood affected by the proposed traffic calming plan within forty (40) days after issuing the proposed plan. Notice of the hearing shall be published in a newspaper having general circulation in the City at least ten (10) business days prior to the hearing. In addition, a notice of the hearing shall be mailed by regular mail to each petitioner, to the head of all residential households, and businesses on the petitioned street and within

five hundred (500) feet of the petitioned street and to the president or designated representative of any area Neighborhood Association. The failure of an individual or entity to receive the notice of Public Hearing shall have no effect on the process or decision on traffic calming. At the meeting the Traffic Engineer will explain the proposed plan and options and take a vote on them of those in attendance who claim to be age 18 or older and who reside or who have a business on the petitioned street and announce the results. The results shall be advisory only to the Traffic Engineer. Following the meeting, the Traffic Engineer will issue a final plan within thirty (30) days and mail a copy by certified mail return receipt requested to the petitioners, the City Manager, and to any Councilor residing in the district where the street is located. (Ord. No. 234-99, 3-29-99; Ord. No. 198-03/04, 6-7-04)

Sec. 28-257. Petition approving traffic calming plan.

(a) In all zones except the R-4 and R-6 zones, following receipt from the Traffic Engineer of a final traffic calming plan, the plan shall be classified as approved if a petition accepting the plan is filed with the City Clerk containing a number of signatures of residents and business owners on the petitioned street who are eighteen (18) years of age or older equal to or exceeding sixty percent (60%) of the base number applicable to that zone.

(b) In the R-4 and R-6 zones, following receipt from the Traffic Engineer of a final traffic calming plan, the plan shall be classified as approved if a petition accepting the plan is filed with the City Clerk containing a number of signatures and residents and business owners on the petitioned street who are eighteen (18) years of age or older equal to or exceeding fifty one percent (51%) of the base number applicable to that zone.

(c) The petition process in (a) or (b) must be initiated within ninety (90) days of the date of mailing of the traffic calming plan.

(d) The petitioners shall follow the process established in Section 9-36(c) of this Code and the Clerk shall provide the petitioners with appropriate petition forms pursuant to that Section except that the Clerk shall have twenty (20) days to prepare the petition forms to be circulated. Prior to providing the forms the Clerk shall verify the number of dwelling units on the street and the base number for the purpose of establishing the number of signatures needed for a petition. The Clerk shall inform the Petitioners' Committee in writing of both numbers. In all zones except the R-4 and R-6 zones, the base number shall equal the number of dwelling units multiplied by one and one-half (1.5). In the R-4 and R-6 zones, the base number shall equal the number of dwelling units multiplied by one. The one and one-half (1.5) multiplier shall apply to any traffic calming petitions with a filing deadline on or after May 1, 2003.

(e) The petition shall be circulated, filed and processed pursuant to Section 9-36(c) and (d) except that the petitioners shall have 120 calendar days to circulate the petition and file it.

(f) The petition shall be verified pursuant to the process in Section 9-36(e) with the additional requirement that the Clerk's Certificate of Sufficiency shall be sent to the City Traffic Engineer as well as to the City

Council. In verifying the petition the Clerk shall only have to verify that it contains the necessary number of signatures and is timely filed.

(Ord. No. 234-99, 3-29-99; Ord. No. 21 03/04, 7-21-03; Ord. No. 198-03/04, 6-7-04)

Sec. 28-258. Financing traffic calming plans.

(a) Approved traffic calming plans under section 28-257 shall be submitted to the City Council for financing in accordance with subsections (b) and (c).

(b) The cost of traffic calming plans approved by petitioners shall be included by the Director of Public Works with the Department's annual CIP budget requests in the same manner that funding is requested for sidewalk work.

(c) In its preparation of the annual City budget and Capital Improvement Program, the City Council may provide such funding for traffic calming projects as it deems appropriate. Funds allocated for traffic calming shall be disbursed on a District basis in the same manner that sidewalk funds are disbursed.

(Ord. No. 234-99, 3-29-99; Ord. No. 198-03/04, 6-7-04)

Sec. 28-259. Elimination or modification of traffic calming plan.

(a) After six (6) months from the date on which a traffic calming plan was installed or implemented, any ten or more residents or business owners on a specific City street or a City Councilor may file a written petition or request to eliminate or modify the traffic calming plan with the City Clerk. The petition or request shall meet the requirements of Sec. 28-252.

(b) If at any time following the installation of a traffic calming plan the Public Works Director or the Director's designee determines that such measure is creating a hazard to public health and safety, the Public Works Director may take immediate steps to remove or modify a traffic calming plan accordingly. There is no right to appeal such a determination; however, further modifications to a traffic calming plan on such affected street may be undertaken as provided in section 28-258.

(Ord. No. 234-99, 3-29-99; Ord. No. 198-03/04, 6-7-04)

Sec. 28-260. Process following filing of petition or request for elimination or modification of a traffic calming plan.

(a) Following receipt of a petition or a written request from a councilor for the elimination or modification of a traffic calming plan that has been forwarded by the Clerk, the Traffic Engineer will call and conduct a neighborhood meeting on that issue pursuant to Sec. 28-256.

(b) Following the neighborhood meeting, the Traffic Engineer will issue a written decision regarding the elimination or modification of a traffic calming plan and file it with the Clerk who shall forward copies forthwith to the petitioners and each member of the City Council.

(c) If the decision of the Traffic Engineer calls for the elimination or modification of the traffic calming plan, the decision shall go into effect if a petition is filed and certified following the process established in §28-257, that supports the decision and that contains the signatures of fifty one percent (51%) or more of the residents and business owners on the same street that was the subject of the traffic calming plan, regardless of the zone where the street is located.

(d) If the decision of the Traffic Engineer is to leave the traffic calming plan in place, the decision may be appealed by the petitioners or any ten residents or business owners, age eighteen (18) or over, who reside or have a business on the petitioned street pursuant to Sec. 28-257. If the appeal is successful, the appellants must follow the petition process in (c) above in order to eliminate or modify the traffic calming plan.
(Ord. No. 234-99, 3-29-99; Ord. No. 198-03/04, 6-7-04)

Sec. 28-261. Funding for elimination or modification of traffic calming plans.

Funding for the elimination of traffic calming plans shall be done in accordance with Sec. 28-258.
(Ord. No. 234-99, 3-29-99)

Sec. 28-262. Installation of traffic calming devices.

(a) The physical installation of traffic calming devices shall be consistent with the traffic calming plan approved by the Traffic Engineer. The associated traffic control devices must conform to design standards established by the Traffic Engineering Department.
(Ord. No. 234-99, 3-29-99; Ord. No. 198-03/04, 6-7-04)

Sec. 28-263. Limitation on petitions or requests.

The same street or one that is substantially the same may not be the subject of a petition or request for a traffic calming plan for a period of two (2) years from the date of a final decision rejecting or denying a plan pursuant to Sec. 28-253. If a plan is implemented, a petition or request to eliminate or modify it cannot be initiated for six (6) months from the date on which the plan is in place. If a plan is eliminated, a petition or request to implement a plan cannot be initiated for two (2) years from the date on which the elimination was complete.
(Ord. No. 234-99, 3-29-99; Ord. No. 198-03/04, 6-7-04)

Sec. 28-264. Street categories for determining preliminary eligibility.

(a) Streets eligible for traffic calming.

- (1) Principal arterials, minor arterials and collector streets as defined in the Federal Classification system and shown on a map on file in the Clerk's Office and the Public Works Office.
- (2) Local streets: a street that is in a zone that permits residential dwelling units and on which seventy five (75%)

percent or more of the abutting properties have residential structures.

(b) Streets not eligible for traffic calming.

(1) Limited access freeways and expressways that are part of an Interstate System as defined in the Federal Classification System.

(2) Streets that score less than 200 points on the threshold eligibility table in Sec. 28-265(a).

(Ord. No. 234-99, 3-29-99)

Sec. 28-265. Tables.

(a) Thresholds for traffic calming plan.

Threshold	Criteria	Max. Pts.
Volume	Vehicles per day X .05	100 pts.
Speed Warrant	(85 th percentile speed- Posted Speed Limit)	100 pts.
Children	1 pt./child for each child less than 12 years of age living on street (75 max.) 25 pts. For school on the street	100 pts.
Heavy Vehicles (HVPD)	2 pts. For each heavy vehicle defined as 2 axle-6 tire and larger. Applicable only to residential streets	100 pts.
Residential Density	75% - 25 pts. 80% - 30 pts. 85% - 35 pts. 90% - 40 pts. 95% - 45 pts. 100% - 50 pts.	50 pts.
	Total Points (max.)	450 pts.

Minimum of 200 pts. Required to qualify for traffic calming.

(b) Guidelines for use of traffic calming devices.

Type of Road	Description of Problem	Potential Solution (In Order of Preference)
Local/collector	Speed	Review speed limit
		Review or modify stop sign locations
		Check warrants for traffic signals
		Neighborhood watch
		Road humps
		Speed tables
		Colored paving/textured paving
		Raised intersections
		Medians
		Curb extensions or vegetation
		Traffic circle/roundabout
	Cut-through traffic	Review or modify stop sign locations
		One way streets
		Road humps
		Speed tables
		Turn or entry prohibited
	Pedestrian Safety	Check warrants for traffic signals
		Colored and textured paving
		Barrels
		Raised crosswalk
		Curb extensions
		Medians
		Raised intersection
		One way street
		Traffic circles/roundabout
		Turn or entry prohibited
Arterial	Speed	Review Speed limit
		Review or modify stop sign locations
		Check warrants for traffic signals
		Medians, curb extensions, or vegetation
	Cut-through traffic	Review or modify stop sign locations
		One way streets
		Turn or entry prohibited
	Pedestrian safety	Check warrants for traffic signals
		Barrels
		Medians
		One way streets

(Ord. No. 234-99, 3-29-99; Ord. No. 198-03/04, 6-7-04)

Sec. 28-266. Applicability.

This Ordinance shall not apply to any traffic calming projects implemented before the effective date of this Ordinance.

(Ord. No. 234-99, 3-29-99)

Appendix B

Portland Traffic Calming Projects

Existing Conditions

Traffic Calming Project Status

Table 1
Traffic Calming Project Status

Project Status	Number
Installed	47
In progress	6
Did not pass	11
Proposed	33
Total Projects	97

Friday, February 15, 2008

Status	Project	Description	Dist	Device	How	Requested	Installed	Notes
Did not pass	Alpine Rd	Entire length	5	none		10/1/2002		did not qualify
Did not pass	Clifton St	Vannah to Forest	3	none		5/11/2001		did not qualify
Did not pass	Cypress St	Entire length	5	none		3/25/2001		
Did not pass	Eastman Ave	Entire length	5	none		7/24/2003		vocal group
Did not pass	Elm	Elm and Oxford	1	Stop sign request		2/10/2004		
Did not pass	Elm	Elm and Lancaster	1	Stop sign request, signal?		12/19/2003		
Did not pass	Montrose Ave.	Entire length	3	none	P	7/18/2001		
Did not pass	Newton	Entire length	5	none		4/1/2001		collected data
Did not pass	Pennell Ave.	Entire length	5	none				cut-through traffic
Did not pass	Prospect St.	Deering to Beacon	3	none		4/17/2001		
Did not pass	Stone	Entire length	1	none		7/21/2003		
in progress	Brentwood St	Entire length	5	none	5			review # children
in progress	Dartmouth St.	Deering to Forest	3	4-way stop proposed	3	6/11/2003		qualifies, no action
In Progress	Ludlow St.	Ludlow @ Marlow	5	Stop Sign	P	1/1/1999	?	parking and issues
in progress	Maine Ave.	Washington to Ray	4	speed tables proposed	4			awaiting Capisic results
in progress	Presumpscot	Washington to True	4	school streetscapes completed	4			Petition status? Data collected 01
in progress	Summit St.	Bramblewood to Abby	5	concept plan in progress				now safety
Installed	Bartley	Bartley @ Junior	5	Stop sign	C	8/1/2005	10/11/2005	SS policy
Installed	Baxter/Vannah	intersection	4	traffic signal	P			Study done
Installed	Beacon	at Orland St					10/3/2007	SS policy
Installed	Belmont St.	Belmont and Melrose	3	stop sign	P/C	7/1/2004	8/20/2004	two petitions, SS Policy
installed	Bolton St	Entire length	3	3 speed tables installed	P			pre-ordinance
installed	Capisic St	Entire length	3	3 speed tables - circles	P	2002	2004	circles to tables
Installed	Chestnut	Chestnut and Oxford	1	Stop sign	MGR	2/10/2004	6/30/2004	SS policy
Installed	Clifton St	at St. George		Stop sign		3/31/2006		SS policy
installed	Colonial Rd	Entire length	3	stop signs	P	6/1/1999	9/9/2003	Colonial/Rockland
installed	Columbia Rd	Entire length	3	small islands, stops signs	P	3/27/2002	9/9/2003	Gay and Leeman
Installed	Curtis Rd	Entire length	5	stop signs	C	7/30/2003	9/30/2003	Curtis/Abby
Installed	Curtis Rd	at Abbey	5	stop sign	C			SS policy
Installed	Deepwood Dr.	Deepwood at R. Brook	5	Stop sign	C	6/23/2003	7/21/2003	SS policy
installed	Deering Ave	Deering @ Coyle	3	4-way flasher installed, removed	P		Apr-04	Petition no flasher, removed Nov 05
Installed	East Kidder	East Kidder @ Provid	4	Stop sign	C	?	11/19/2004	SS policy

Installed	Edgeworth	at Leeman	5	Stop sign at Leeman	P	7/1/2002	10/22/2001	pre SS policy
Installed	Edwards St.	at Elizabeth	3	Stop sign at Elizabeth	P	7/1/2002	11/25/2003	pre SS policy
installed	Emery St.	Pine to Spring	2	Added on-street parking	P	9/30/1999	9/27/2001	On street parking
installed	Falmouth St.	Falmouth @ Exeter	3	stop signs	P	8/20/2002	4/1/2003	
Installed	Falmouth St.	Falmouth @ Payson	3	stop signs	P	8/20/2002	4/1/2003	
Installed	Forest Avenue	Warren to Riverside In.		Streetscape, bike lanes, islands	DPS		Nov-07	island painted in first as test
installed	Hennessy	Entire length	5	3 speed tables, 2 remain				pre-ordinance
Installed	Highland St.	Fairmont to Prospect	3	stop signs at one intersection	P/C	7/9/2003	7/1/2004	Highland/Fairmont
installed	Jackson St.	Entire length	5	stop signs and circle	P	5/1/2001	7/1/2002	Jackson/Kenneth
Installed	Jeanne St	at Wingate Dr		Stop sign	C		12/11/2007	SS policy
Installed	Knight Street	Maplewood @ Knight	4	Stop sign	C	11/1/2005	11/23/2005	SS policy
Installed	Lane	Lane and Pari Place	5	Stop sign	C	8/1/2005	9/27/2005	SS policy
Installed	Leland	Leland and Richardson	5	Stop sign	C	9/1/2005	11/8/2005	SS policy
Installed	Little Rd	Little and Starbird	3	Stop Sign	P	9/1/2004	11/16/2005	SS policy
Installed	Madeline	Madeline and Fuller	5	Stop sign	C	9/1/2005	10/17/2005	SS policy
Installed	Maine Ave.	Maine and Virginia	4	Stop sign	P/C	7/25/2005	9/27/2005	SS policy
Installed	Marlborough	Marlborough @ Ivaloo	4	3-way stop installed via policy*		7/1/2003	9/29/2005	SS policy
installed	Mass Ave.	Entire length	3	3 speed tables installed	P	11/29/2001	11/17/2004	installed fall 2004
Installed	Pine St.	at Winter St.		stop sign			8/31/2007	SS policy
Installed	Pineloch Dr.	Pineloch & Heather	5	stop signs	C	7/30/2003	9/15/2003	SS policy
installed	Ray St	Ray @ Merrymeeting	4	stop signs	P	4/1/2001	6/26/2002	no action taken
Installed	Ray St.	Maine to Ivaloo	4	speed tables installed	P	7/1/1999	7/1/2000	Speed tables
installed	Ray St.	Ray @ Penn	4	stop signs	P	4/1/2001	6/26/2002	
Installed	Rustic Ln	Rustic @ Fall	5	Stop sign, petition 4/19/02	C	9/1/2005	10/11/2005	SS policy
installed	Stevens	Forest to Woodford	5	6 speed tables installed			10/1/1997	10/1/1997, pre-ord
Installed	Summit St.	Washington-Lambert	5	temporary island installed			2001	island later removed
installed	Summit St.	at Jackson St	5	stop sign installed			2005	four way stop
Installed	Virginia	Virginia @ Nevada	4	Stop sign request	C	10/1/2005	11/7/2005	SS policy
Installed	Virginia	Virginia @ Penn Ave	4	Stop sign request	C	10/1/2005	11/7/2005	SS policy
Installed	Washington	Allen's Corner - R-side	5	Raised islands				islands installed 2007
Installed	Westminster	Westminster-Leeman	5	Stop sign request	C	11/1/2005	12/1/2005	SS policy
Installed	Woodford St.	Brighton and Stevens	3	reconstruction, narrowing			2006	island installed 2005
proposed	Abby Ln	at Pamel Rd	5	Stop sign request		10/1/2005		petition received Oct 04
proposed	Alice St	at Hope Ave		Stop sign request	C/Cit	12/16/2005		

proposed	Brackett St.	Brackett and Neal	3	Stop sign request, petition 2004	P	12/1/2004		Request for new data 11/07
proposed	Bradley		3	Congress to Brighton		11/1/2004		
proposed	Caleb St.		3	Traffic calming	P	6/11/2004		
proposed	Chadwick	Chadwick & Carroll	2	Stop sign request	Cit	11/1/2005		
proposed	Codman	study done	4	study done 1999 Gorrill Palmer		1998		No action
proposed	Concord	Concord and Lawn Ave	4	Stop sign request		9/1/2005		
proposed	Craigie	Traffic Calming	3	Petition for traffic calming	P	7/22/2005		
proposed	Cumberland Ave	at North St.	1	Stop sign	C	2005		No parking extended sight distance
proposed	Deepwood Dr.	at Pineloch Dr	5	Stop Sign	P	11/14/2006		
Proposed	Douglas	St. James to West Sch	3	Petition for traffic calming	P	9/28/2005		
proposed	Frances St.	Congress and Brighton	3		P	9/26/2003		
proposed	Free St.	Free @ Oak	1	Stop sign request	Cit	11/1/2005		Data collected, not installed
proposed	Gilman St	Congress to MMC	2	Traffic calming		3/14/2002		petition submitted
Proposed	Granite	Granite @ Deane	3	Stop sign request	Cit	9/1/2005		
proposed	Hersey St.		4	speed bumps proposed		9/5/2000		cut through
proposed	Illsley St.		4	Entire length		7/1/2004		
proposed	Mellen	at Grant St.		Stop sign	C	10/27/2007		Status?
proposed	Oxford St.	Oxford @ Stone	1	Stop sign request	Cit	11/1/2005		
proposed	Palmer Ave	Allison to Shepherd	5	none		Sep-08		counts were done
proposed	Park St.	Spring to Danforth	2			10/12/2004		
proposed	Providence	Lower E. Kidder to Pres	4	Traffic calming	P	9/6/2005		petition received
proposed	Randall St.	Entire length	4	none		10/9/2001		
proposed	Sheridan St.	Walnut-Cumberland	1			4/19/2005		speeding
proposed	Sherwood St.	Ocean to Presumpscot	4	4-way stops proposed				2002 data collected
proposed	Stuart St.	Entire length	5	none				data collected 2001
proposed	Valley St	at "A St	2	counselor request	C	May-07		
proposed	Valley St.	at "C" St	2	counselor request	C	May-07		
proposed	Valley St.	Valley and "D" Street	2	On hold	Cit	2/12/2004		pending I-295 Connector data
proposed	West St.	at Carleton St		Stop sign request		Nov-07		
proposed	Whitney Ave	Entire length	3	speed tables requested				
proposed	Woodford	Woodford @ Melrose	3	Stop sign request		9/14/2004		

Appendix C

Excerpt from

Manual of Uniform Traffic Control Devices, 2003 Edition

Section 2B.07 Multi-way Stop Applications

Multi-way stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multilayer stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal. The restrictions on the use of STOP signs described in Section 2B.05 also apply to multi-way stop applications.

The decision to install multi-way stop control should be based on an engineering study. The following criteria should be considered in the engineering study for a multi-way STOP sign installation:

- A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.
- B. A crash problem, as indicated by 5 or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right- and left-turn collisions as well as right-angle collisions.
- C. Minimum volumes:
 - 1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and
 - 2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but
 - 3. If the 85th-percentile approach speed of the major-street traffic exceeds 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the above values.
- D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Other criteria that may be considered in an engineering study include:

- A. The need to control left-turn conflicts;
- B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;
- C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop; and
- D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.

Appendix D

Multi-way Stops - The Research Shows the MUTCD is Correct!

W. Martin Bretherton Jr., P.E. (M)

Abstract

This paper reviewed over 70 technical papers covering all-way stops (or multi-way stops) and their success and failure as traffic control devices in residential areas. This study is the most comprehensive found on multi-way stop signs

The study looked at how multi-way stop signs have been used as traffic calming measures to control speed. There have been 23 hypotheses studied using multi-way stop as speed control. The research found an additional 9 hypotheses studied showing the effect multi way stops have on other traffic engineering problems.

The research found that, overwhelmingly, multi-way stop signs do NOT control speed except under very limited conditions. The research shows that the concerns about unwarranted stop signs are well founded.

Introduction

Many elected officials, citizens and some traffic engineering professionals feel that multi-way stop signs should be used as traffic calming devices. Many times unwarranted stop signs are installed to control traffic. The Manual on Uniform Traffic Control Devices (MUTCD) (16) describes warrants for installing multi-way stop signs. However, it does not describe many of the problems caused by the installation of unwarranted stop signs. These problems include concerns like liability issues, traffic noise, automobile pollution, traffic enforcement and driver behavior.

This paper is a result of searching over 70 technical papers about multi-way stop signs. The study concentrated on their use as traffic calming devices and their relative effectiveness in controlling speeds in residential neighborhoods. The references found 23 hypotheses on their relative effectiveness as traffic calming devices. One study analyzed the economic cost of installing a multi-way stop at an intersection. The reference search also found 9 hypotheses about traffic operations on residential streets.

The literature search found 85 papers on the subject of multi-way stops. There are probably many more references available on this very popular subject. The seventy-one references are shown in Appendix A. There was a problem finding the 14 papers found in literature searches. The 14 papers are listed in Appendix

B for information only. Most of the papers were from old sources and are probably out of print.

Multi-Way Stop Signs as Speed Control Devices

A summary of the articles found the following information about the effectiveness of multi-way stop signs and other solutions to controlling speeds in residential neighborhoods.

1. Multi-way stops do not control speeds. Twenty-two papers were cited for these findings. (Reference 1, 2, 7, 8, 10, 12, 13, 14, 15, 16, 17, 19, 20, 39, 45, 46, 51, 55, 62, 63, 64, 66 and 70).
2. Stop compliance is poor at unwarranted multi-way stop signs. Unwarranted stop signs means they do not meet the warrants of the MUTCD. This is based on the drivers feeling that the signs have no traffic control purpose. There is little reason to yield the right-of -way because there are usually no vehicles on the minor street. Nineteen references found this to be their finding. (Reference 7, 8, 10, 12, 13, 14, 15, 17, 19, 20, 39, 45, 46, 51, 55, 61, 62, 63 and 64).
3. Before-After studies show multi-way stop signs do not reduce speeds on residential streets. Nineteen references found this to be their finding. (Reference 19 (1 study), 55 (5 studies), 60 (8 studies) and 64(5 studies)).
4. Unwarranted multi-way stops increased speed some distance from intersections. The studies hypothesizing that motorists are making up the time they lost at the "unnecessary" stop sign. Fifteen references found this to be their finding.(Reference 1, 2, 7, 8, 10, 13, 14, 17, 19, 20,39, 45,46, 51, 55, 70 and 71).
5. Multi-way stop signs have high operating costs based on vehicle operating costs, vehicular travel times, fuel consumption and increased vehicle emissions. Fifteen references found this to be their finding. (Reference 3, 4, 7, 8, 10, 14, 15, 17, 45, 55 ,61, 62, 63, 67 and 68).
6. Safety of pedestrians is decreased at unwarranted multi-way stops, especially small children. It seems that pedestrians expect vehicles to stop at the stop signs but many vehicles have gotten in the habit of running the "unnecessary" stop sign. Thirteen references found this to be their finding. (References 7, 8, 10, 13, 14, 15, 17, 19, 20, 45, 51, 55 and 63).
7. Citizens feel "safer" in communities "positively controlled" by stop signs. Positively controlled is meant to infer that the streets are controlled by unwarranted stop signs. Homeowners on the residential collector feel safer on a 'calmed' street. Seven references found this to be their finding. (Reference 6, 14, 18, 20, 51, 58 and 66).
Hypothesis twelve (below) lists five references that dispute the results of these studies.
8. Speeding problems on residential streets are associated with" through" traffic. Frequently homeowners feel the problem is created by 'outsiders'. Many times the problem is the person complaining or their neighbor. Five references found this to be their finding. (References 2, 15, 45, 51 and 55).

9. Unwarranted multi-way stops may present potential liability problems for undocumented exceptions to accepted warrants. Local jurisdictions feel they may be incurring higher liability exposure by 'violating' the MUTCD. Many times the unwarranted stop signs are installed without a warrant study or some documentation. Cited by six references. (Reference 7, 9, 19, 46, 62 and 65).

10. Stop signs increase noise in the vicinity of an intersection. The noise is created by the vehicle braking noise at the intersection and the cars accelerating up to speed. The noise is created by the engine exhaust, brake, tire and aerodynamic noises. Cited by five references. (Reference 14, 17, 20, 45, 55).

11. Cost of installing multi-way stops are low but enforcement costs are prohibitive. many communities do not have the resources to effectively enforce compliance with the stop signs. Five references found this to be their finding. (Reference 1, 10, 45, 51, 55).

12. Stop signs do not significantly change safety of intersection. Stop signs are installed with the hope they will make the intersection and neighborhood safer. Cited by five references. (Reference 55, 60, 61, 62, 63).

Hypothesis seven (above) lists seven references that dispute the results of these studies.

13. Unwarranted multi-way stops have been successfully removed with public support and result in improved compliance at justified stop signs. Cited by three references. (Reference 8, 10, 12).

14. Unwarranted multi-way stops reduce accidents in cities with intersection sight distance problems and at intersections with parked cars that restrict sight distance. The stop signs are unwarranted based on volume and may not quite meet the accident threshold. Cited by three references. (Reference 6, 18, 68).

15. Citizens feel stop signs should be installed at locations based on traffic engineering studies. Some homeowners realize the importance of installing 'needed' stop signs. Cited by two references. (References 56, 57).

16. Multi-way stops can reduce cut-through traffic volume if many intersections along the road are controlled by stop signs. If enough stop signs are installed on a residential or collector street motorists may go another way because of the inconvenience of having to start and stop at so many intersections. This includes the many drivers that will not stop but slowly 'cruise' through the stop signs. This driving behavior has been nicknamed the 'California cruise'. Cited by two references. (Reference 14, 61).

17. Placement of unwarranted stop signs in violation of Georgia State Law 32-6-50 (a) (b) (c). This study was conducted using Georgia law. Georgia law requires local governments to install all traffic controls devices in accordance with the MUTCD. This is probably similar to traffic signing laws in other states. Cited by two references. (Reference 19, 62).

18. Special police enforcement of multi-way stop signs has limited effectiveness. This has been called the 'hallo' effect. Drivers will obey the 'unreasonable' laws as long as a policeman is visible. Cited by two references. (Reference 39, 46).

19. District judge orders removal of stop signs not installed in compliance with city ordinance. Judges have ordered the removal of 'unnecessary' stop signs. The problem begins when the traffic engineer and/or elected officials are asked to consider their intersection a 'special case'. This creates a precedent and results in a proliferation of 'special case' all-way stop signs. Cited by two references. (Reference 59, 62).

20. Some jurisdictions have created warrants for multi-way stops that are easier to meet than MUTCD. The jurisdiction feel that the MUTCD warrants are too difficult to meet in residential areas. The reduced warrants are usually created to please elected officials. Cited by two references. (Reference 61 and 70).

21. Citizens perceive stop signs are effective as speed control devices because traffic "slows" at stop sign. If everybody obeyed the traffic laws, stop signs would reduce speeds on residential streets. Cited by one reference. (Reference 55).

22. Removal of multi-way stop signs does not change speeds but they are slightly lower without the stop signs. This study findings support the drivers behavior referenced in item #4, speed increases when unwarranted stop signs are installed. Speed decreases when the stop signs were removed! Cited by one reference. (Reference 64).

23. Multi-way stops degrade air quality and increase CO, HC, and Nox. All the starting and stopping at the intersection is bad for air quality. Cited by one reference. (Reference 68).

Speed Control Issues

24. There are many ways to "calm" traffic. Cited by twenty-two references. (Reference 1, 14, 20, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 44, 45, 46, 47, 48, 50, 51, 53 and 66).

They include:

- (a) Traffic Chokers (f) Sidewalks and Other Pedestrian Solutions
- (b) Traffic Diverters (g) Neighborhood Street Design
- (c) Speed Humps (h) On-Street Parking
- (d) Roundabouts (i) One Way Streets
- (e) Neighborhood Speed Watch (j) Street Narrowing

25. Other possible solutions to residential speed. Most speeding is by residents - Neighborhood Speed Watch Programs may work. This program works by using the principle of 'peer' pressure. Cited by seven references. (Reference 2, 30, 31, 36, 42, 48 and 53).

26. Reduced speed limits are not effective at slowing traffic. Motorists do not drive by the number on the signs, they travel a safe speed based on the geometrics of the roadway. Cited by five references. (Reference 1, 20, 39, 46 and 69).

27. Local streets should be designed to discourage excessive speeds. The most effective way to slow down traffic on residential streets is to design them for slow speeds. Cited by two references. (Reference 43, 52).

28. Speeding on residential streets is a seasonal problem. This is a myth. The problem of speeding is not seasonal, it's just that homeowners only see the problem in 'pleasant' weather. That's the time they spend in there front yard or walking the neighborhood. Cited by one reference. (Reference 2).

29. Speed variance and accident frequency are directly related. The safest speed for a road is the speed that most of the drivers feel safest driving. This speed creates the lowest variance and the safest road. Cited by one reference. (Reference 47).

30. The accident involvement rate is lowest at the 85th percentile speed. The 85th percentile speed is the speed that most drivers feel comfortable driving. The lowest variance is usually from the 85th percentile speed and the 10 mph less. Cited by one reference. (Reference 47).

31. Psycho-perceptive transverse pavement markings are not effective at reducing the 85th percentile speed but do reduce the highest speed percentile by 5 MPH. Cited by one reference. (Reference 47).

32. The safest residential streets would be short (0.20 miles) non-continuous streets that are 26 to 30 feet from curb to curb width. The short streets make it difficult of drivers to get up to speed. Cited by one reference. (Reference 52).

Economics of Multi-Way Stop Signs

Studies have found that installing unwarranted stop signs increases operating costs for the traveling public. The operating costs involve vehicle operating costs, costs for increased delay and travel time, cost to enforce signs, and costs for fines and increases in insurance premiums.

The total costs are as follows (Reference 55):

Operating Costs (1990) (\$.04291/Stop)	\$ 111,737/year
Delay & Travel Costs (1990) (\$.03401/Stop)	\$ 88,556 /year
Enforcement Costs (1990)	\$ 837/year
Cost of Fines (19 per year)	\$ 1,045/year
Cost of 2 stop signs (1990)	\$ 280

Costs of increased insurance (1990) \$7,606/year

Total (1990) \$210,061/year/intersection

The cost to install two stops signs is \$280. The cost to the traveling public is \$210,061 (1990) per year in operating costs. This cost is based on about 8,000 vehicles entering the intersection per day.

Another study (62) found that the average annual road user cost increased by \$2,402.92 (1988 cost) per intersection when converting from two to four way stop signs for low volume intersections.

Summary of Stop Signs as Speed Control Devices

Researchers found that multi-way stop signs do not control speed. In analyzing the 23 hypotheses for multi-way stop signs, five were favorable and 18 were unfavorable toward installing unwarranted all-way stop signs. The Chicago study (6) was the only research paper that showed factual support for "unwarranted" multi-way stop signs. They were found to be effective at reducing accidents at intersections that have sight distance problems and on-street parking.

It is interesting to note that residential speeding problems and multi-way stop sign requests date back to 1930 (63). The profession still has not "solved" this perception problem.

Summary of Economic Analysis

Benefits to control speeds by installing multi-way stop signs are perceived rather than actual and the costs for the driving public are far greater than any benefits derived from the installation of the multi-way stop signs.

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Appendix E

Case Studies and Traffic Calming Examples

Staff researched comparable cities around the United States to present traffic calming case studies and examples (see pp 41-53). One City Councilor suggested adding “Woonerfs,” or examples of traffic restricted streets, such as those found in Europe (see page 54).

City	2000 Population⁵	Page
Brooklyn, NY Action Program	2,465,326	41
Greenville, NC	60,476	43
Chapel Hill, N.C. (swells to 75,000 during school)	48,715	46
Carlsbad, CA	78,245	48
Charlottesville, Virginia (swells to 60,000 during school)	45,049	50
Boulder, CO	94,673	53
Traffic Restricted Streets: Woonerfs	Examples in Europe	54

⁵ U.S. Census 2000.

1. BROOKLYN, NEW YORK ACTION PROGRAM

The Action Program in Brooklyn, NY is a good example of traffic calming measures presented in the context of other transportation improvements, including bicycle and pedestrian circulation, transit improvements, truck and bus movements and through traffic.

ACTION PROGRAM

E6.1 Traffic Management Themes

A number of themes underlie the traffic calming strategy for Downtown Brooklyn. These themes, and the appropriate traffic calming tools to address them, are introduced briefly below. Each of these themes was considered in the development of the traffic calming action plan for each corridor. Note that these are not site-specific recommendations, but rather generic actions available to planners in the development of the area wide traffic calming strategy.

E6.1.1 Pedestrian circulation and connectivity

Because Brooklyn's surface streets carry large volumes of vehicles, some high-traffic streets are difficult for pedestrians to cross during peak hours and logical pedestrian desire lines go unserved. Strategy recommendations that address pedestrian connectivity issues include:

- **neckdowns** and **medians** to shorten crossing distances,
- signalized **mid-block crossings** to introduce connections on long blocks, and
- **leading pedestrian intervals, all-pedestrian phases, and turn restrictions** to build pedestrian confidence and visibility at key intersections.

E6.1.2 Improving transit operations

Although eighteen New York City Transit bus routes serve Downtown Brooklyn, roadway congestion slows bus speeds, causes bus bunching, and hinders the ability of buses to merge back into traffic after stopping. Illegal parking and standing in bus stops create difficulties for bus drivers and for boarding and exiting passengers. Strategy recommendations that address transit operations issues include:

- **bus bulbs** to simplify bus maneuvers and improve the bus-to-sidewalk interface, and
- improved **subway/sidewalk passenger** connection.

E6.1.3 Developing the bicycle network

Although many neighborhoods in Downtown Brooklyn have dedicated bicycle lanes, critical gaps still exist in the area-wide cycling network. Strategy recommendations that address bicycle network issues include:

- **new bike lanes** to give cyclists safe, dedicated routes to ride,
- **neckdowns, gateways, and other measures** aimed at slowing traffic, and
- **enhanced bike lanes** to clearly delineate routes

Since the Downtown Brooklyn Traffic Calming Project began, NYCDOT has developed a

policy regarding using high-visibility treatments to enhance bicycle lanes. Lanes adjacent to the curb will receive priority for high-visibility bicycle treatments; this will clearly indicate that the lane is designated for movement of bicycles and should not be blocked by parked vehicles. This is a higher priority than “non-curbside” lanes because violations by parked vehicles in curbside lanes result in blockage of cyclists’ movement. The Department’s goal is to implement bicycle lanes identified in this report and the New York City Bicycle Master Plan in as expeditious a manner as possible. Therefore, “non-curbside” lanes will be implemented using standard treatments.

E6.1.4 Truck access and routing

While trucks are blamed for many traffic problems in Downtown Brooklyn, they are the primary mode of freight access in the City. Maintaining a clear and logical truck network is critical to the local economy. Strategy recommendations that mitigate truck impacts while maintaining truck access to Downtown Brooklyn include:

- **neckdowns and gateways** to keep trucks off Living Streets, and
- **improved street management** to improve conditions for trucks on Travel and Community Streets.

E6.1.5 Managing through traffic

The concept of a Street Management Framework argues that Travel Streets are the appropriate places to accommodate through traffic in Downtown Brooklyn. At the same time, through traffic should be discouraged from using Community and Living Streets, and its impacts should be mitigated on all streets.

Traffic Calming

In the context of reducing traffic’s impacts, the objectives of the study were refined to more closely meet achievable goals. Specific objectives were as follows:

- Do not increase total traffic capacity through the area. Rather, improve efficiency of primary streets while discouraging through movement on other streets in order to redirect traffic from inappropriate routes.
- Reinforce appropriate travel patterns and street usage consistent with the Street Management Framework
- Examine and improve high pedestrian accident locations.
- Examine and reinforce the truck network.
- Examine and reinforce the bicycle network.
- Integrate specific treatments with area-wide strategies.

2. GREENVILLE, NORTH CAROLINA TRAFFIC CALMING

City of Greenville - Neighborhood Traffic Calming Guidelines

Presented by:

The City of Greenville

Public Works Department

Engineering Division

September 28, 2001

2

Table of Contents

Purpose 3

Qualifying Criteria for Traffic Calming Devices 3

Procedure for Applying for Traffic Calming Devices 4

Funding 5

Types of Traffic Calming Devices 5

Requirements for Specific Traffic Calming Devices 6

Placement of Traffic Calming Devices 7

Appendices

Appendix A: Sample Letter from the City Enclosing a Petition and Other Materials 8

Appendix B: Traffic Calming Request Form 9

Appendix C: Sample Petition 10

Appendix D: Sample Insufficient Number of Petition Signatures Letter 11

Appendix E: Sample Petition Acceptance Letter 12

Appendix F: Speed Hump Specifications 13

Appendix G: Speed Hump Markings 14

Appendix H: Traffic Circle Specifications 15

Appendix I: Placement of a Traffic Circle 16

3

City of Greenville

Neighborhood Traffic Calming Guidelines

Purpose

The City of Greenville continually strives to strengthen and protect its neighborhoods by improving the quality of life in residential areas. Traffic conditions on residential streets can greatly affect neighborhood livability. Speeding traffic and unnecessary through traffic in neighborhoods create safety hazards on residential streets. When traffic problems become a daily occurrence, our sense of community and personal well-being are threatened.

In 1997, the City of Greenville began its *Traffic Calming Pilot Program* to assess the methods of studying, planning with neighborhood residents, and applying traffic calming strategies. The *City of Greenville Neighborhood Traffic Calming Guidelines* was developed to guide City staff and inform residents about the processes and procedures for implementing traffic calming on residential streets.

Qualifying Criteria for Traffic Calming Devices

In order to qualify for traffic calming devices under the City of Greenville Neighborhood Traffic Calming Program, the roadway being considered for the traffic calming device(s):

- Must be a City-maintained public street classified as a two-lane standard residential, minor residential, or collector street under the City of Greenville's *Manual of Standard Designs and Details (MSDD)*.
- Must have a roadway width of less than or equal to 40 feet (back-of-curb to back-of-curb).
- Must have average daily traffic volumes greater than or equal to 1,000 vehicles per day.
- Must have speeds of the 85th percentile equal to or greater than 10 miles over the posted speed limit. The speed limit must already be posted at 25 mph.

Requirements for Specific Traffic Calming Devices

1. Speed Humps

- The grade of the roadway must be less than or equal to 8 percent.
- The roadway should have a horizontal radius of less than or equal to 300 feet.
- If this treatment is recommended by staff, all adjacent property owners must approve the location.
- The roadway is not the primary emergency vehicle route. The City Traffic Engineer will contact the Police and Fire/Rescue Departments to determine if the speed hump will interfere with the response to emergency calls.

2. Traffic Circles

- If landscaping is installed, the residents must agree to install and maintain vegetation via an agreement with the City.
- This must be a 4-way intersection.

3. Multi-way Stops

- No intersections should receive multi-way stops if they are within 800 feet of another intersection having stop control.
- No intersections should receive multi-way stops when the side street is less than 400 feet in length.
- If this treatment is recommended by staff, there must be at least a 75 percent endorsement from households within a radius of 1,200 feet from the intersection proposed to receive a multi-way stop. This may not require a second petition if the original petition already shows a 75 percent endorsement.
- The major roadway should be a minimum length of 0.50 miles.
- There should be a 60-40 percent volume split between the two roads for a 4-way intersection.
- There should be a 75-25 percent volume split between the two roads for a 3-way intersection.

4. Diverters

- If landscaping is installed, residents agree to install and maintain vegetation via an agreement with the City.
- A documented significant cut-through problem should exist.

5. Edge Line Pavement Markings

- Streets should have a minimum width of 36 feet (back-of-curb to back-of-curb).
- On-street parking should show underutilization.
- The marking should be a maximum of 8 feet from edge line to face of curb (or 6 feet from edge of pavement) to prevent confusing the outside area with a travel lane.

Placement of Traffic Calming Devices

1. Speed Humps

- Humps should be placed at least 400 feet apart.
- The stopping sight distance should be greater than or equal to 200 feet.
- Speed humps should be at least 200 feet from an intersection.
- They should be as close to property lines as possible.
- If possible, the humps should be placed under streetlights for greater visibility.
- They should be placed at least 10 feet from driveways.

2. Traffic Circles

- The typical placement of a traffic circle is in the middle of a four-way intersection. The size of the intersection determines the exact placement and size of the traffic circle.

In order to qualify for traffic calming devices under the City of Greenville, NC Neighborhood Traffic Calming Program, the roadway being considered for the traffic calming device(s):

- Must be a City-maintained public street classified as a two-lane standard residential, minor residential, or collector street under the City of Greenville's *Manual of Standard Designs and Details (MSDD)*.
- Must have a roadway width of less than or equal to 40 feet (back-of-curb to back-of-curb).
- Must have average daily traffic volumes greater than or equal to 1,000 vehicles per day.
- Must have speeds of the 85th percentile equal to or greater than 10 miles over the posted speed limit. The speed limit must already be posted at 25 mph.⁶

⁶ Greenville, North Carolina Traffic Calming Program.

3. Chapel Hill, North Carolina

<http://www.townofchapelhill.org/documents/Engineering/Traffic%20Engineering%20Program/Traffic%20Calming%20Policy.pdf>

Chapel Hill TC Ordinance policy excellent example of the following:

- Annual TC request process
- Only neighborhood streets
- Specific criteria for stop signs (not mid block)

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Related Links

[Traffic Calming Devices](#)

[Traffic Calming Policy](#)

[Traffic Calming Request Form](#)

[Traffic Impact Analysis Procedures](#)

Responsibilities

To request review of traffic congestion or traffic safety concerns for drivers, cyclists or pedestrians, please call the Engineering Department at 968-2833. Most of the major streets in Chapel Hill are part of the State highway system. For requests regarding these roads, Town staff will be glad to contact the NC Department of Transportation on your behalf.

For safety concerns related to maintenance of streets, bikeways and sidewalks, please call the Public Works Department at 919-968-2796. For emergency repair needs, please call the Public Works Department or, after normal hours and on weekends, the Police Department at 919-968-2760.

Traffic Control and Parking Operations

To request consideration of a new ordinance or a change in a present ordinance on parking, stop regulations, speed limits, etc., please call the Town's Engineering Department at 919-968-2833.

Traffic Calming Devices

Traffic calming devices are meant only as speed reduction devices in residential neighborhoods where traditional police enforcement is not consistently available. Speed humps and raised pedestrian crosswalks are in place on several streets in Chapel Hill. Speed humps have reduced speeds by an average of 5 mph. However, they have not reduced traffic volumes significantly. The Town Council approved Policy and Procedures for Traffic Calming Devices in Chapel Hill and to request a copy of the policy and express interest in traffic calming in your neighborhood, please call Engineering Department at 919-968-2833 or visit the [Traffic Calming Policy](#) page.

Traffic Signals

The traffic signal system in Chapel Hill includes approximately 100 traffic signals, on both State roads, and on the town's street system. All of the signals are maintained by the Town. The Town operates and maintains all traffic signals in Chapel Hill and Carrboro. Most of the traffic signals are owned by the State but maintained by the Town through a municipal agreement.

Signs and Markings

The Town installs and maintains traffic control signs and pavement markings on the Town streets. Signs and markings on State roads are installed and maintained by the State. However, all street name signs on both Town and State roads are installed and maintained by the Town.

If you have noticed a road sign that is damaged, missing or where one is needed, contact Town's Public Works Department at 919-968-2800 (7:00 am – 5:00 pm) or 919-968-2760 (After Hours).

4. CARLSBAD, CALIFORNIA - TRAFFIC CALMING

Along with addressing traffic issues in new neighborhoods, Carlsbad's Residential Traffic Management Program is designed to make streets in existing neighborhoods safer for pedestrians and children. When motorists cut quickly through residential streets to escape traffic on

major thoroughfares, it disturbs tranquility and decreases safety.

In response to the twin problems of high volumes and excessive speeds in neighborhoods, the City Council, which was cognizant of the new engineering approach called traffic calming, elected to obtain solid citizen input before proceeding. It appointed a seven-person committee to work with traffic engineering staff to develop solutions for Carlsbad neighborhoods seriously affected by traffic. The committee worked diligently for almost one year to develop a three-phase approach to meet its three objectives.

- To obtain support of the residents in any neighborhood needing traffic
- To make sure any measures implemented meet the approval of emergency agencies concerned about response times and of utilities whose large vehicles could be adversely affected or damaged by the
- To ensure that residents will be willing to live with the traffic calming
- The first phase of the program is designed to investigate problems and
- The second phase is devoted to studying the specific traffic problems in a neighborhood and to designing measures needed to solve those problems, ranking them by priority.
- The third phase, which involves allocation of funds, begins with the permanent installation of the specific traffic calming measure and culminates with the monitoring of the program for effectiveness.

The program can be customized to fit the needs of the neighborhood

- The transportation division has a big toolbox of traffic calming approaches, including but not limited to speed monitoring, traditional police enforcement, medians and entry/raised islands.
- If a majority of homeowners on a street desire a traffic calming program, a temporary tool can be put in place to determine viability before a permanent solution is installed.

PLANNED DEVELOPMENT ORDINANCE

Approved by the City Council in 2001, this ordinance, by changing previous development standards, will make an extraordinary difference in the "people friendliness" of tomorrow's communities. The ordinance ...

- Doubles the outdoor passive meeting, active recreation and neighborhood gathering space within the entire project.
- Increases the minimum size of each home's backyard.
- Requires a home's interior square footage to be proportional to the size of the lot.
- Greatly reduces and discourages "snout house" design where multiple-car garages take visual precedence over the home.
- Private, gated communities are discouraged. Cumbersome cul-de-sacs will give way to interconnected grids that are easier to navigate and

much safer in times of an emergency.

NEIGHBORHOOD DESIGN STANDARDS

Architects and designers are enthusiastic promoters of the “neotraditional”

5. CHARLOTTESVILLE, VIRGINIA

In 1999, the City of Charlottesville began an innovative initiative to become more responsive to the needs and concerns of its citizens. In an effort to consolidate planning and development services into a manageable and more accessible agency, the Department of Community Development, Public Works' Division of Engineering and the Fire Department's Division of Building and Life Safety have been consolidated into a new department called **NEIGHBORHOOD DEVELOPMENT SERVICES**.

TRAFFIC ENGINEERING **NEIGHBORHOOD TRAFFIC CALMING**

Traffic calming is a proactive attempt to improve the livability of residential neighborhoods and promote pedestrian activity in service districts.

Traffic Calming Process:

1. CIP Meetings to obtain consensus on project.
2. City creates design options.
3. Neighborhood picks design.
4. City ballots affected property owners.
5. 50% response required with 2/3 in favor.
6. Temporary measures installed for 3-4 months.
7. Permanent measures installed.
8. One year after permanent installed, evaluation of how well measure has worked.

Links:

[City Traffic Calming Project Updates](#)

[City Traffic Calming Guidelines](#)

PLEASE CALL (434) 970-3182 IF YOU HAVE ANY QUESTIONS.

LAST UPDATED: 02/22/2005

ANGELA TUCKER

Table of Contents

<u>Introduction</u>	1
Traffic Calming - Process	
<u>Chapter 1 Review of Traffic Calming Programs</u>	
Boulder, Colorado	3
Seattle, Washington	4
Portland, Oregon	5
<u>Chapter 2 Existing Traffic Calming Procedure</u>	6
<u>Chapter 3 Recommended Traffic Calming Procedure</u>	7
Traffic Calming - Device Details	
<u>Chapter 4 Procedural/Administrative/Regulatory Techniques</u>	
Turn or Entry Prohibitions	20
Neighborhood Speed Watch Program	21
Radar Trailer	22
Chapter 5 Physical Techniques	
<u>Horizontal Deflection Services</u>	
Narrowing Treatments	
Striping Treatments	24
Median Treatments	26
Curb Extension Treatments	
One-Lane Slow Points	29
Two-Lane Slow Points	30
Curb Bulb-Outs	35
<u>Weaving Treatments</u>	
Chicanes	38
Serpentine	40
Traffic Circles	42
Roundabouts	48
Traffic Diverters Turning Movement Diverters	51
Residential Neighborhood Gateway Treatments	53
<u>Vertical Deflection Devices</u>	
Rumble Strips	56
Road Bumps	60

Road Humps	60
Speed Tables	66
Raised Intersections	69
<u>Roadway Closures</u>	
Full Roadway Closure	71
Diagonal Roadway Closure	74
Partial Roadway Closure	75
Open Roadway Closure	

Charlottesville, Virginia - Chapter 2:

Existing Traffic Calming Procedure

The existing traffic calming procedures that guide Charlottesville’s program are fundamentally sound (see Appendix A). The guidelines provide for the identification a problem, defining an impact area, city representatives and citizens working together to solve the problem and evaluating the effectiveness of the solution. However, there are areas that could be improved upon that would provide all participants with a more level playing field and allow the city to effectively administer the program. The paragraphs that follow address the shortcomings of the current procedure.

Impact Area Definition – The method for defining the impact area is well suited to deal with traffic calming projects planned for local roads in the Charlottesville area. The Charlottesville Road Classification Map (shown on Page 2, Figure 1) shows a city that is fairly well sectioned by collectors and arterials. Due to this the establishment of “neighborhoods” and impact areas is fairly straightforward. The use of a one block radius and attached cul-de-sacs allows for impacted residents to be included in the decision making process.

When projects are slated for collectors or minor arterials, the “one block” rule should also be employed. However, in certain cases, it may be appropriate to expand the impact area boundaries. This should be done on a case-by-case basis, with the city and project proponents working together to determine the boundaries.

6. Boulder, CO – Neighborhood Traffic Mitigation Program

The Neighborhood Traffic Mitigation Program (NTMP) was developed in 1994 in response to citizens' demands to address speeding on residential streets. The program was not designed to address dangerous intersections, mitigate noise from major arterials, redesign the overall transportation/street classification system or effect a modal shift. The Police Department, Transportation Division, Neighborhood Liaison's Office and Fire Department, each played vital roles in its conception.

The NTMP assists neighborhoods with developing a specific approach and selecting the appropriate speed reduction tools. The program works best when the neighborhood works together through a three-tiered process beginning with **education**, followed by **enforcement** and then **engineering** as the final tool.

Neighborhoods begin to solve the speeding problem by using the **education** tools. For example, the Neighborhood Speed Watch and the Radar Speed Monitoring Trailer help drivers become aware of their speeds. These tools tell drivers that the neighborhood is concerned about speeding. They also educate the residents on the extent of the speeding problem in their neighborhood.

In addition, the speed data can be used to support a request for more **enforcement** activities in the neighborhood. Photo radar is an example of an enforcement tool. The City of Boulder currently has one photo radar van that operates in residential neighborhoods, where physical measures are not possible, on an "as needed" basis.

If a severe speeding problem still exists following the education and enforcement strategies, a neighborhood can request to installation of **engineering** treatments.

Boulder, CO has installed several types of traffic calming devices; among the most popular ones are speed humps, raised intersections and traffic circles. Studies produced by the city staff have shown favorable results with regard to each of the aforementioned devices. Speed humps decreased average daily traffic (ADT) up to 27% and reduced 85th percentile speeds by up to 8 mph. Raised intersections produced varied results with regard to ADT, yet reduced 85th percentile speeds by up to 8 mph. Traffic circles reduced 85th percentile speeds by up to 13 mph.

Traffic-Restricted Streets: Woonerfs and Transit Malls

Paul chasan

Streets for Living: WOONERFS



Traffic restricted streets offer new possibilities for creatively integrating social space with the p. Children play in the right-of-way in this European woonerf.

Image: Hamilton 2000

Streets often constitute up to 1/3 of the land use in a city yet, in our municipal landscape they are often treated as utilitarian corridors rather than vital public spaces. This chapter looks at two street typologies that challenge this axiom: Woonerfs and Transit Malls. Both of which seek to balance the functional need for movement of people and goods with the basic desire we share as individuals and communities for opportunities for social interaction and cultural exchange.

“Imagine driving down a street with no traffic lights, stop signs, lane dividers, or sidewalks. Pedestrians, cyclists, and playing children wander about the road at will, and trees and flowers are planted in the right-of-way. How do you avoid hitting anyone—or anything? Simple. You slow down, maintain eye contact with people around you, and stay alert.”

—Sierra Magazine January/
February 2005



Residents living on Annas Straat in Utrecht set up temporary shelters to watch the Euro 2000 soccer championships.
Image: Hamilton 2000

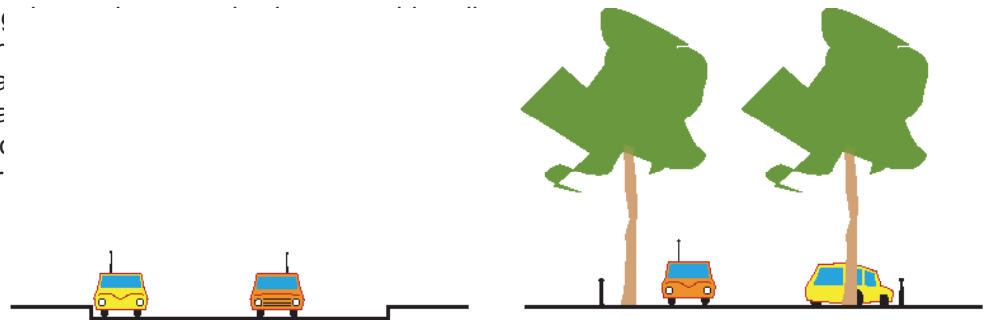
Streets for People

Woonerfs are streets built with high quality urban design where the boundary between people space and car space is intentionally blurred. In doing so, the pedestrian space is extended from the sidewalk, and into the traffic zone. Whereas in a normal street, pedestrians are made to feel like guests in the cars space when they cross the street, woonerfs reverse this axiom. By designing high quality urban spaces, drivers moving through a woonerf are made to feel like guests and modify their behavior accordingly.

In Seattle and other American cities, coercive strategies are generally used to ensure safe driving in neighborhoods. Such tactics include extensive signage, traffic markings and of course traffic laws along with a fleet of traffic cops to enforce them. These methods are costly, create lackluster streets and are largely ineffective. Indeed since people tend to drive as fast as they feel they can control their vehicles, some of our tools for traffic engineering such as lane striping may encourage unsafe driving.

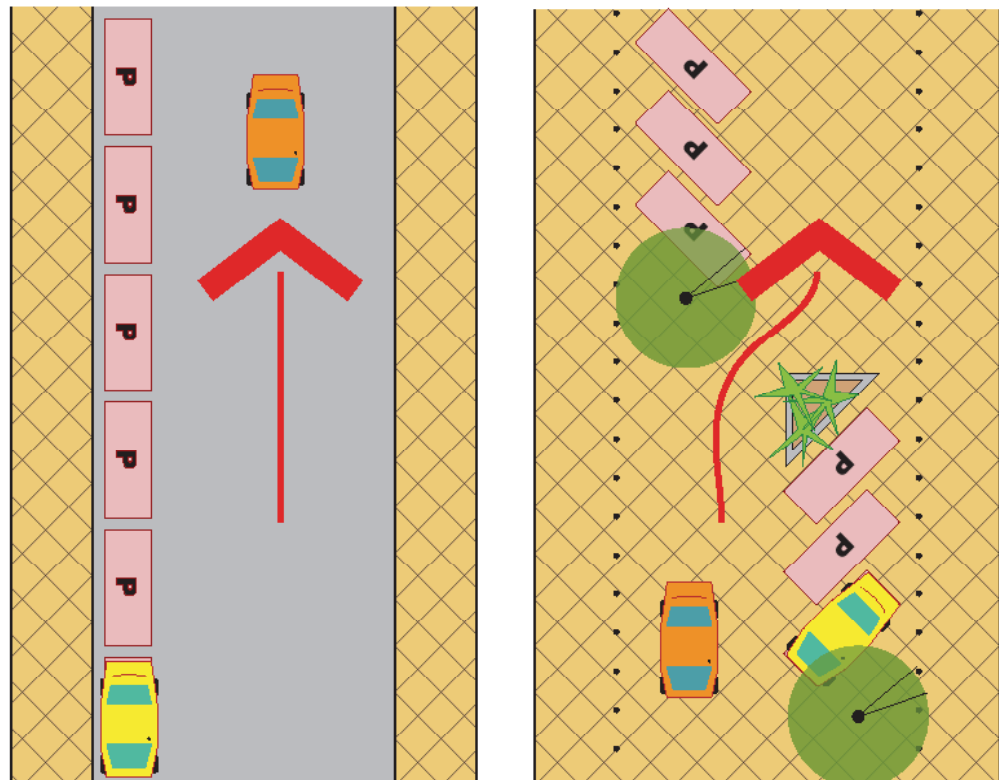
Rather than coerce people into driving safely, woonerfs incent them to do so by using design cues. They achieve this by using the principle of ambiguity. For example, by planting trees in the right-of-way, eliminat-

ing
ar
ce
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we
dr



“...Designing streets so that walking, cycling, social activities, children’s play, parking and local car traffic could all share the same space struck me as such an eminently sensible idea...”

—Ben Hamilton



Streets for Living: WOONERFS

European studies have shown that woonerfs are significantly safer than traditional street configurations and surprisingly do not compromise travel time in residential settings. This is because, by eliminating stop signs, drivers are able to maintain a steady if slow constant speed that is similar to the average speed traveled in start/stop traffic over equivalent distances.



Gateway sculpture emphasizing transition to social space. *Image: Hamilton 2000*



Children and picnic tables share the street. *Image: Hamilton 2000*



Kids, bikes, and plantings in the street
Image: Hamilton 2000



No traffic markings. *Image: Hamilton 2000*



Using parking configurations to obscure sight lines. *Image: Hamilton 2000*



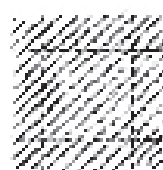
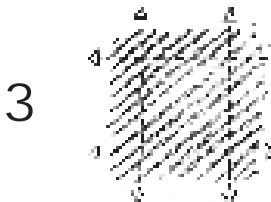
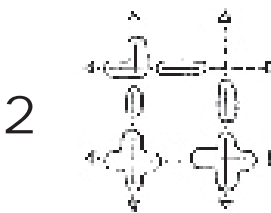
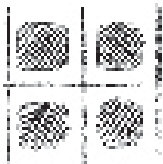
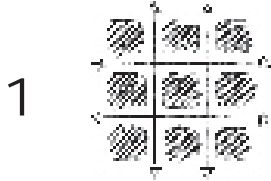
Intricate paving detailing. Note the lack of grade separation between the sidewalk and the street. *Image: Hamilton 2000*

Essential Elements

Woonerfs offer a way for planners and designers to curb the deleterious effects cars can have on neighborhood streets.

There are several methods employed by woonerf designers use to reclaim the street right of way:

- Obscure sight lines
- Plant trees or place other features in the right of way
- Install detailed, intricate paving patterns
- Eliminate the grade separation between sidewalk and the carriage way



Evolution of a System

1. Traffic flows separate calmed residential areas.
2. Major arteries are adapted to overcome severance.
3. The city as a coherent social zone; traffic volumes determined by environmental capacity

Image: Hamilton, 2000

Challenges

Woonerfs offer an exciting lens through which planners and designers can rethink the neighborhood street and interest in replicating this European model for streets continues to grow in the United States. There are challenges that have surfaced by American attempts at building Woonerfs in the different urban context of American towns and cities. Designers should expect to grapple with how to provide access for emergency vehicles, and will need to pay attention to accessibility issues for people with disabilities. Current engineering standards can for example render it impossible to build woonerfs in many American cities. None of these issues is insurmountable. Brookline, Massachusetts, and West Palm Beach, Florida have for example successfully implemented woonerf projects. The idea is likely to continue to spread to more north American cities.

Possible / Implementation and funding Mechanisms

Green Street Projects

SPU stormwater projects

Incremental implementation following street maintenance, utility work and large construction bonds

Neighborhood matching funds

The mayors proposed downtown open space impact fee

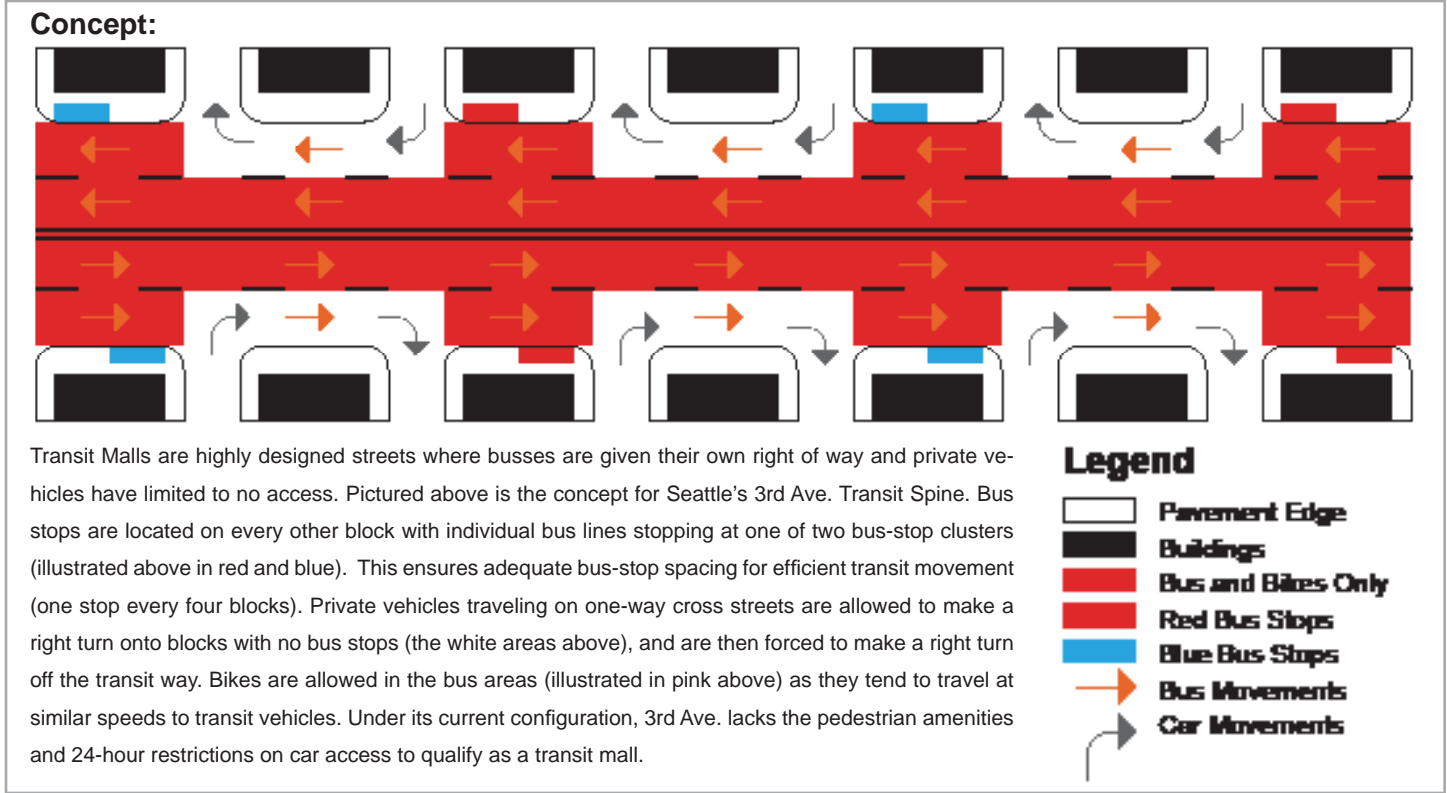
Possible / Opportunities for Pilot Projects

UW Campus Expansion, especiall the more urban southeast campus

South Lake Union redevelopment

Downtown Alleys

Yesler Terrace Reconstruction



Transit Mall

Transit malls can be effective tools to ensure the efficient movement of transit in congested urban corridors while providing quality pedestrian and in some cases, retail environments.

With the recent closure of the bus tunnel to renovate it for light rail, Seattle has created the nascent underpinnings of a transit mall along Third Ave. downtown. Third Ave. is uniquely situated for this role as it runs the length of downtown and is roughly equidistant from the water and I-5. The new "3rd Ave. transit spine" was initially conceived as be a transit-only street throughout the day, but the city caved at the last minute and the street currently acts as a transit mall solely during peak commute times when private cars are effectively restricted from the street.

Whether or not the street will remain a transit mall when the bus tunnel reopens remains to be seen. However the City Center Circulation Report, a policy document available on SDOT's website that was written in 2003 calls for the street to remain a bus only corridor.

Should the city choose to keep the street as a bus way, an opportunity exists to enhance the public realm with urban design treatments. Unique paving, street trees and street furniture a la San Francisco's Market Street or the Portland Transit Mall (see case study), can cement the 3rd Ave. as Downtown Seattle's Main St. Such a move would make 3rd Ave. a true spine for the city both as an organizational framework for our bus system as well as in the mental maps of the residents and denizens who inhabit our downtown.

Streets for Living



Public amenities along the Portland Transit mall

Images: TriMet

Case Study Portland:

The Portland Transit Mall was created in 1977 as the culmination of a two pronged strategy to improve transit flow downtown and spark downtown development, especially retail. Limited car access was provided in one lane on some parts of the transit-priority streets but on-street parking was removed and replaced with widened sidewalks, lavish street furniture, public art, fountains and street trees.

While the commercial space on did not develop to the degree city officials had hoped, transit flow was greatly enhanced. There have been issues with business owners along the mall wanting on-street parking. The city recently studied increasing parking supply, but decided against it because the street space was needed for a future light rail expansion.

Over time, the city has continued to tweak the transit mall's design and is currently undergoing a design process to update the corridor.

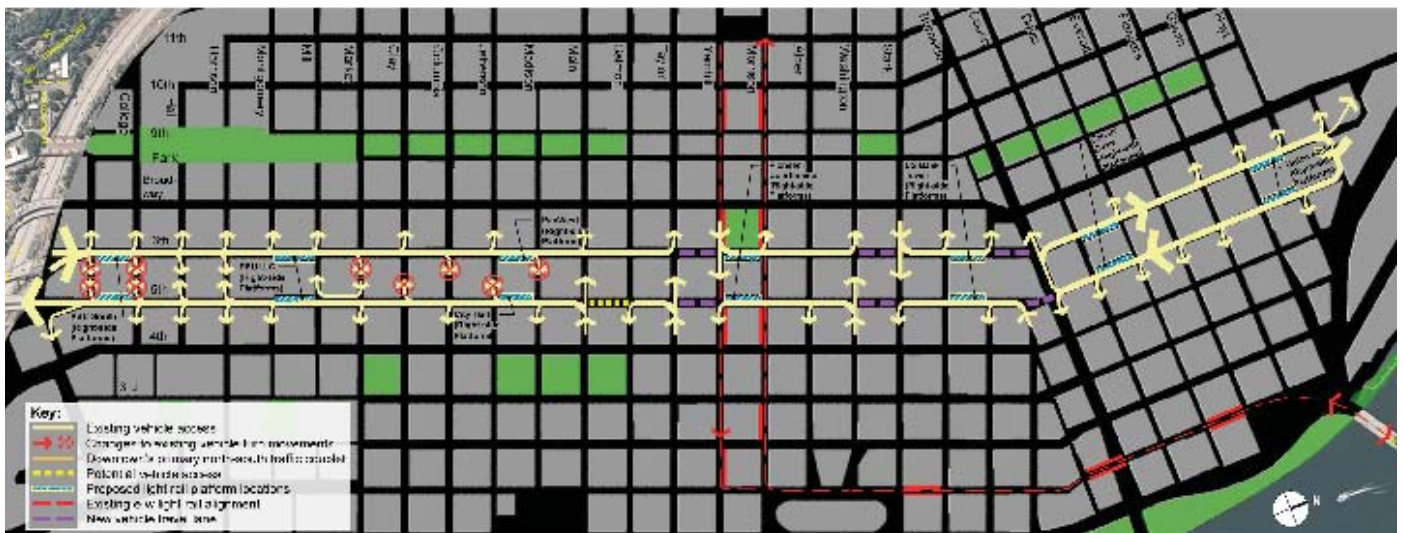
Cities that have either implemented or are studying creating transit malls:

- Portland, OR
- Vancouver, BC
- Toronto, ON
- Sydney, Australia
- San Francisco, CA
- Seattle?

Streets for Living: TRANSIT MALLS



Portland's Transit mall: Limited car access, and generous pedestrian amenities.
Image: TriMet. <http://www.trimet.org/inside/photogallery.htm>



Car Access along the Portland Transit Mall. Image: TriMet