

A POLICY RESOLUTION

adopting the "Neighborhood Traffic Management Program" for calming traffic on residential streets in the City of Columbia.

WHEREAS, the City of Columbia, Missouri (hereinafter "City") has an interest to provide traffic calming solutions, where appropriate, in order to influence driver behavior, improve a neighborhood's quality of life, and create more livable local streets; and

WHEREAS, the existing traffic calming policy established by the City's Public Works Department to improve pedestrian safety and create safer neighborhoods for the citizens of Columbia was established in 1999; and

WHEREAS, as part of the previous traffic calming policy, a report to the City Council has been required for each traffic calming project; and

WHEREAS, a more consistent and streamlined method of evaluation and implementation is desired when traffic calming requests are submitted to the City's Public Works Department; and

WHEREAS, the goal of the Neighborhood Traffic Management Program is to enable City's Public Works Department to work closely with neighborhood residents to properly identify traffic concerns, conduct appropriate studies to quantify any problems, and develop solutions to reduce traffic speeds and collisions, or the severity of collisions should they occur; and

WHEREAS, the City Council finds a data driven, responsive and transparent traffic calming program as set forth herein will be a more effective way of handling traffic calming requests.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. The City Council hereby approves and adopts the "Neighborhood Traffic Management Program," a copy of which, marked "Exhibit A," is attached to this resolution. The Neighborhood Traffic Management Program shall serve as a policy guide for calming traffic on residential streets in the City of Columbia.

SECTION 2. The City Council hereby approves and adopts the "Traffic Calming Guidebook," a copy of which, marked "Exhibit B," is attached to this resolution. The Traffic Calming Guidebook shall serve as a policy guide and resource for implementation of the Neighborhood Traffic Management Program.

SECTION 3. The City Council hereby approves and adopts the "Neighborhood Speed Watch Program," a copy of which, marked "Exhibit C," is attached to this resolution. The Neighborhood Speed Watch Program shall serve as a policy guide and resource for implementation of the Neighborhood Traffic Management Program and is a method whereby concerned citizens can take an active role in assessing the need for traffic calming devices in their neighborhood by utilizing radar equipment furnished by the City.

SECTION 4. An annual report shall be submitted to the City Council by the Public Works Director, or the Director's designee, for the evaluation of traffic calming projects and the appropriation of funding for projects authorized by the City Council.

ADOPTED this _____ day of _____, 2013.

ATTEST:

City Clerk

Mayor and Presiding Officer

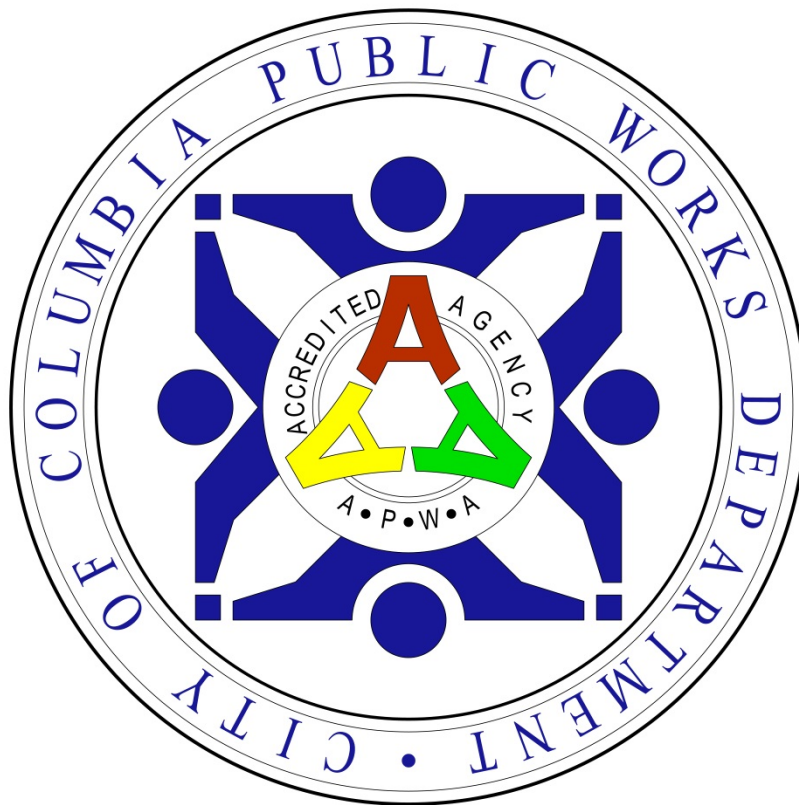
APPROVED AS TO FORM:

City Counselor

City of Columbia Public Works Department

Neighborhood Traffic Management Program

How to Increase Safety, Reduce Speeds, and/or Reduce Volumes



City of Columbia Public Works Department
701 East Broadway
Columbia, MO 65201
573-874-7250

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City of Columbia

Public Works Department

Neighborhood Traffic Management Program

Mission Statement: It shall be the mission of the Public Works Department to provide traffic calming solutions where appropriate in order to influence driver behavior, improve the neighborhood quality of life, and create more livable local streets.

Goal: To work closely with residents of the neighborhood to properly identify the concerns, conduct appropriate studies to quantify any problems and develop solutions that will reduce traffic speeds and collisions or the severity of collisions should they occur. This will in turn improve pedestrian safety and create more pleasant neighborhoods for the citizens of Columbia.

Purpose: Although neighborhood traffic concerns generally relate to excessive speed, pedestrian and bicycle safety, cut-through traffic, accidents and general quality of life issues, this program recognizes the uniqueness of neighborhoods and that the critical issues and concerns vary from case to case. Based on this diversity, this program considers a wide range of potential solutions to address specific concerns of a neighborhood. The recommended solutions resulting from this program should fall into one or more of the following broad categories:

- 1. Increase Safety**
- 2. Speed**
- 3. Volume**

The recommended solution should be based on the existing and intended traffic volumes, speeds, and geometrics for the roadway. The Neighborhood Traffic Management Program strives to utilize all types of traffic calming devices to address neighborhood concerns. The City of Columbia recognizes that a “one-device fits all” approach is not desirable and the program specifically encourages each neighborhood to develop a traffic calming solution that addresses their specific needs.

Traffic Calming Measures: The City’s traffic management program involves three levels of traffic management and traffic calming measures. The level approach allows for quicker more visible solutions then progresses to more aggressive measures, while allowing for a customized solution addressing the specific problem. Detailed information regarding specific types of traffic calming devices is provided in the Traffic Calming Guidebook.

Level 1 Devices (Increase Safety): Level 1 traffic calming devices and programs may be implemented on a regular basis to regulate, warn, guide, inform, enforce, and educate motorists, bicyclists, and pedestrians. They include standard striping and signing elements, minor roadway design elements to improve visibility and safety, enforcement by police, and safety education programs. Level 1 devices are used primarily in those areas where is not excessive or serious, but where traffic control and/or education is appropriate. Some possible Level 1 devices may include but are not limited to:

Level 1 Traffic Calming Devices	
Warning Signs	Traffic Signal Timing
High Visibility Signs	Striping Changes
Radar Trailer/ Radar Signs	Curb Markings
Police Enforcement	Signing Modifications
Lighting Improvements	Sign Turn Restrictions
Parking Modifications	Neighborhood Speed Monitoring

Level 2 Devices (Speed): Level 2 devices are traffic control devices and roadway design features primarily designed to slow traffic within residential areas. They are employed when either the use of Level 1 devices don't effectively address speeding issues, and;

- 85th percentile speed is greater than 33 mph and ADT is over 400
- 85th percentile speed is greater than 38 mph and ADT is over 250

Some possible elements include but are not limited to:

Level 2 Traffic Calming Devices	
Traffic Circles	Speed Humps
Medians	Chokers
Chicanes	Raised Crosswalks
Minor Bulbouts	Major Bulbouts

Level 3 Devices (Volume Controls): Level 3 devices are traffic control devices and roadway design features primarily designed to discourage cut-through traffic from using residential streets. They are used when traffic volumes are significantly higher in the studied area than on similar streets in other areas. While Level 3 devices can be used to discourage cut-through traffic and reduce volumes, special attention must also be paid to connectivity. Connectivity is vital to the City of Columbia and reduces volume by distributing traffic across many streets. Level 3 devices can be used by themselves or in conjunction with Level 1 and Level 2 devices. Some common devices include but are not limited to:

Level 3 Traffic Calming Devices	
Full Street Closure	Partial Street Closure
Diverter	Extended Medians
Open Road Closure	

Traffic Calming Decision-Making Process Diagram

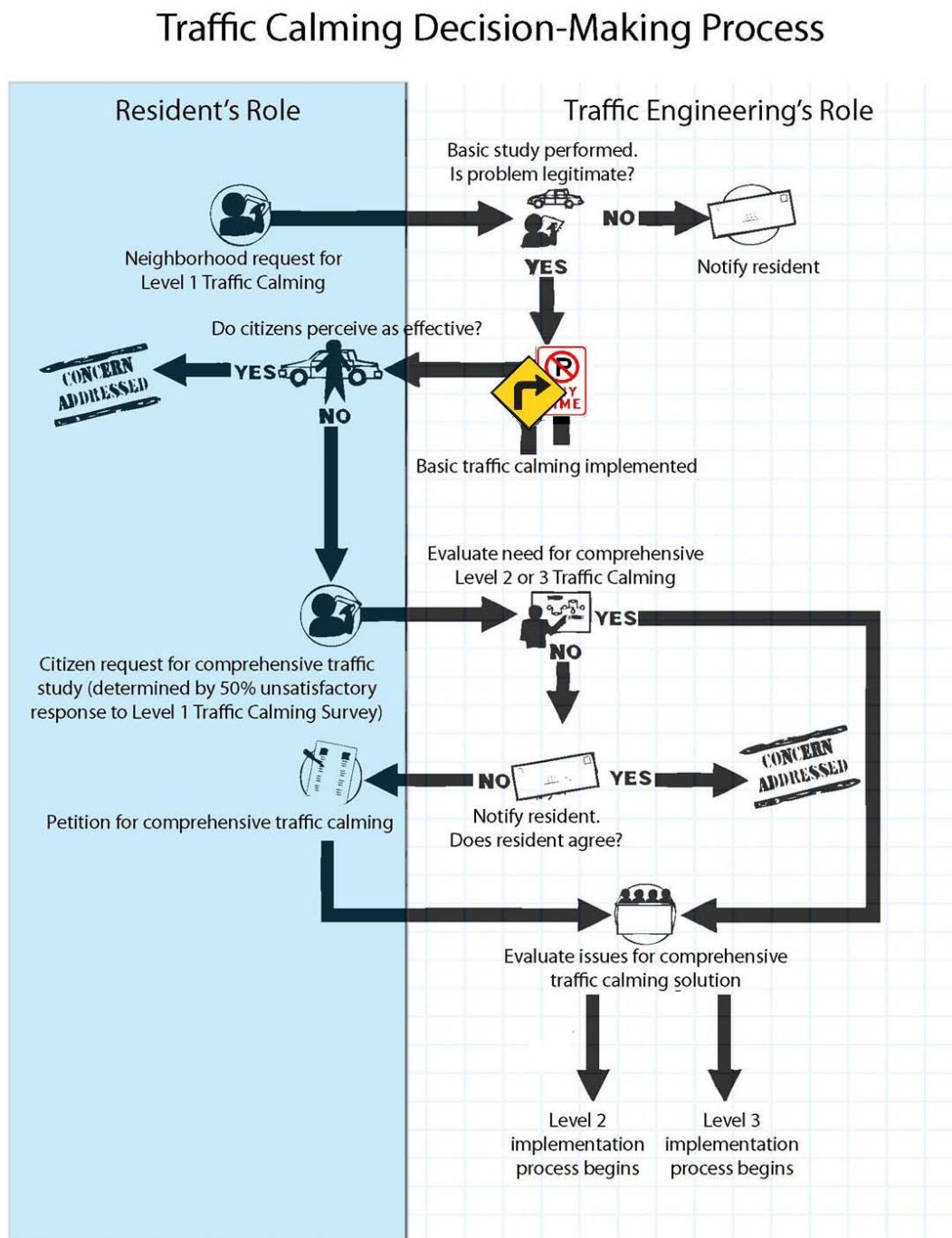


Figure 1-1

Level 2 and 3 Implementation Process

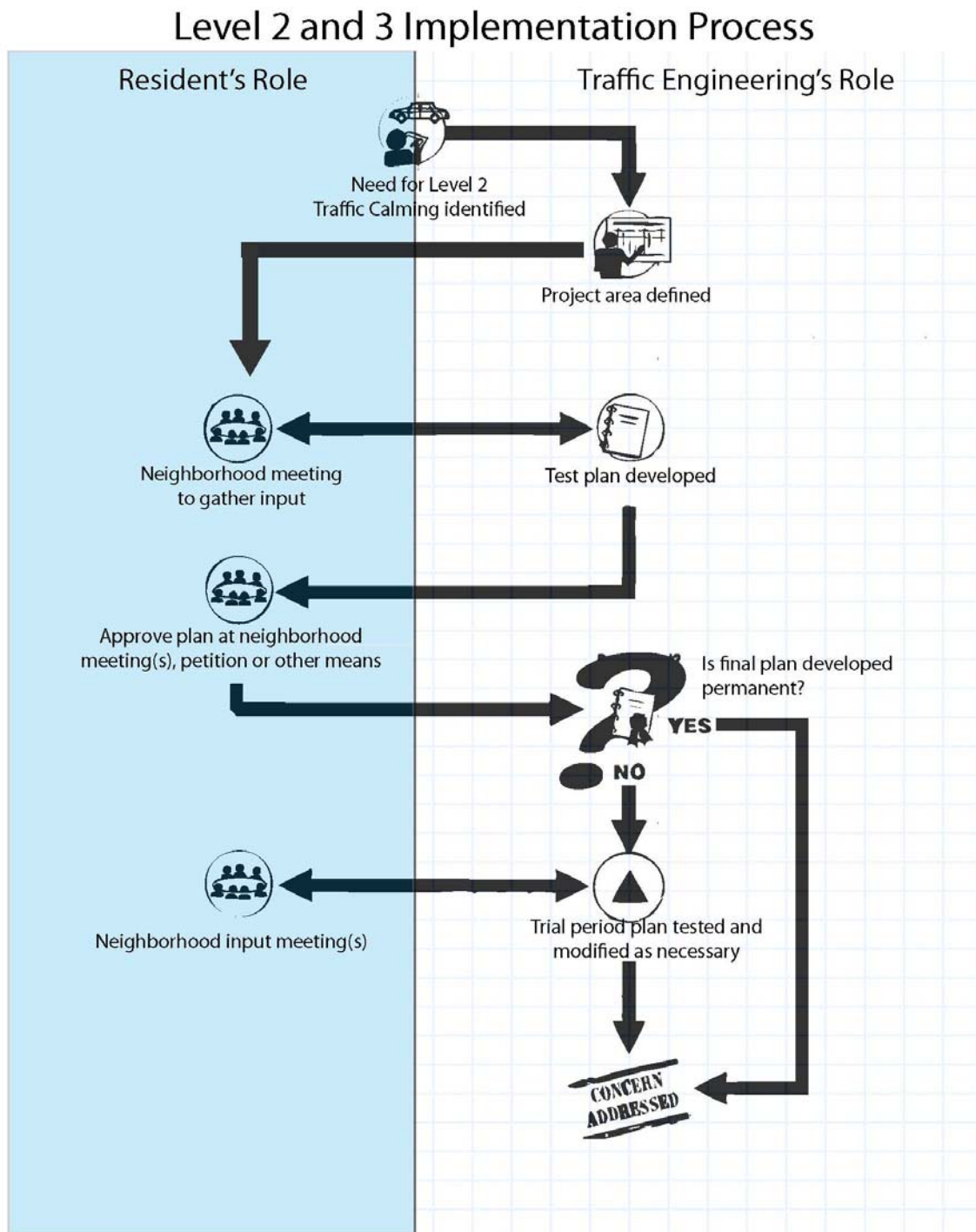


Figure 1-2

Procedure: The traffic calming decision-making process is shown in Figure 1-1 on Traffic Calming Decision Making Process. The Procedure highlights the roles played by residents and the Public Works Department. Level 1 traffic calming should be completed prior to beginning the Level 2 or 3 procedure.

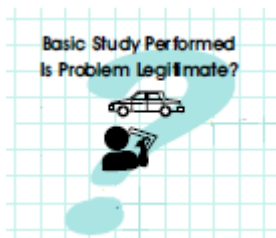
Level 1 Procedure

Traffic Calming Request-*Neighborhood*



To begin the traffic calming process please contact the Public Works Department at 874-7250, or collect 10 signatures on the Neighborhood Request for Level 1 Traffic Calming and send to the Public Works Department. The signers must be at least 18 years of age and signatures are limited to two per household. This petition can be found on page 14.

Basic Study Performed-*City*



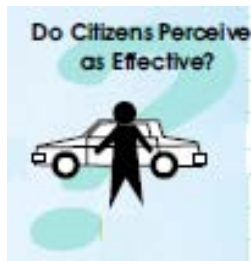
The Public Works Department will perform the appropriate study to address the requester's particular concern and situation.

Basic Traffic Calming Implemented-*City*



The application of some Level 1 devices is subject to independent policies and guidelines, such as those for crosswalks, stop signs, traffic signals, and bike lanes.

Do Citizens Perceive as Effective?- *Neighborhood*



Approximately 6 months after installation/implementation a short survey will be sent to the residents that signed the petition. The survey will include 3 questions.

- 1) Are you satisfied with the results of the Traffic Calming Project?
 - Satisfied
 - Unsatisfied
 - Neither

- 2) Did the Traffic Calming Project fix the problem? Score from 1 to 5.

Problem Not Fixed	Problem Somewhat Fixed	Problem Fixed
1	2	3
4	5	

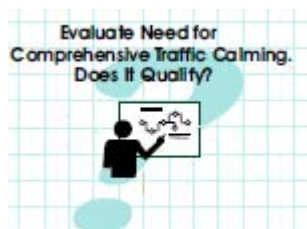
- 3) Describe any problems seen since the implementation of the Traffic Calming Project.

Citizen Request for Comprehensive Traffic Calming - *Neighborhood*



With a 50% or greater negative response the project can be evaluated to see if it qualifies for Level 2 or 3 traffic calming.

Evaluate Need for Comprehensive Traffic Calming- *City*



If Level 1 devices or responses are inadequate as shown by the Citizen Survey, the Public Works Department will conduct a study for comprehensive traffic calming (Level 2 or 3). The Public Works Department will place plate counters or other devices at the area in question to receive two key pieces of data. The Average Daily Traffic (ADT) which is, the amount of vehicles driving on the road per day.

The other key piece of data is the 85th percentile speed which is traditionally used to help set speed limits. It tends to be the speed that most people feel comfortable driving. To qualify for Level 2 or 3 traffic calming the area in question must be a paved residential street in the City Limits and meet 1 set of the criteria below:

Minimum ADT	Minimum 85 th percentile speed (mph)
400	33
250	38

Petition for Comprehensive Traffic Calming-*Neighborhood*



Level 1 Traffic Calming has been implemented, received over a 50% negative response, and the area in question does not meet the minimum qualifications. The Petition for Comprehensive Traffic Calming found on page 16 in the Appendix will be filled out and used as a petition for Level 2 or 3 traffic calming. Since the area does not meet minimum qualifications substantial neighborhood backing is required in the form of 65% positive survey response.

Level 2 or 3 Procedure: To initiate the procedure, a neighborhood group must first have implemented a Level 1 traffic calming project. At that time, the Public Works Department staff will provide a Petition for Comprehensive Traffic Calming to be filled out by the neighborhood group. The neighborhood may be determined by the following methods:

Need for Level 2 Traffic Calming Identified-*Neighborhood*



Level 1/Basic options have been implemented and have been found to be inadequate.

Project Area Defined-*City*



There are four ways to define the project area:

- 1) All residences along the street in question
- 2) All residences in the homeowners association
- 3) Per plat(s) or legal description(s)
- 4) Area defined by the Traffic Engineer

Community Meeting to get Input-*Neighborhood/City*



The neighborhood meetings will work laterally with the plan being developed. The Public Works Department will work closely with the neighborhood to develop a plan for traffic calming. A public meeting will be held in the community to discuss the problems and potential solutions.

At a minimum, representatives of the Public Works Department will attend these meetings and, where necessary, representatives of the Police and Fire Department may attend to discuss enforcement and emergency services.

Test Plan Developed-*City*



Based on the comments received at the public meeting, the neighborhood and Public Works Department staff will proceed with developing a recommended solution.

Approve Plan-*Neighborhood/City*



The neighborhood should be in agreement on the Traffic Calming device that will be implemented and its location. The plan will have to be approved by the neighborhood with a 65% majority via community meeting, survey, or petition.

Plan Installed and Monitored-*Neighborhood/City*



Once the plan is agreed upon it will be placed on the list for traffic calming devices requested and put in the yearly report to City Council. As with most decisions involving public infrastructure improvements, the final approval of any traffic calming project will lie with City Council. Some devices (Typically Level 3) require specific City Council approval, extending the time period before installation.

Project Prioritization:

Due to the participation in the Neighborhood Traffic Management Program the City of Columbia finds it important to prioritize the projects. The City uses a prioritization system to ensure that projects are scored in fact and not opinion. The prioritization system ensures an even playing field and provides transparency to the process.

The following information is used to develop a numerical score for each candidate street being considered for traffic calming measures; traffic volume, traffic speed, proximity to pedestrian generators, proximity to schools, and designation as a current or future bicycle route.

Traffic Volume (20 points maximum): points are based on the average daily traffic volume divided by 120.

Speed (45 points maximum): points are based on the 85th percentile speed minus the posted limit (psl) multiplied by 3

Schools (10 points maximum): 5 points are given for schools within $\frac{1}{2}$ mile radius of the subject street; 10 points are given for schools within $\frac{1}{4}$ mile radius of the subject street.

Proximity to Pedestrian Generators (5 points for each generator, 10 points maximum): Points are given to parks, trails, hospitals, colleges, transit routes/ bus stops, or C-2 zoning districts that are within $\frac{1}{8}$ mile radius of the subject street

Collisions (10 points maximum) 2 points are given to each collision in an average year

Bicycle Routes (5 points): Streets designated as a current or future bike route or have bike lanes are given 5 points.

Finalize Neighborhood Funding Partnership: Public Works Department staff will determine the engineer's estimate for total construction and maintenance costs for the project. The neighborhood may choose to contribute funds towards the project. The projects will be presented to City Council on an annual basis. In the presentation to City Council the amount contributed by the neighborhood will be clearly shown in association with the project. The contributions from the neighborhood will not move the project higher or lower on the priority list, but it will lower the "Cost to the City", which is presented with the Prioritization Score. Payment from the neighborhood (if any) will be through a one-time cash payment.

Project Implementation: After the City Council's approval for the implementation of the year's Traffic Calming projects, the construction of the approved projects will be scheduled as soon as practical.

Evaluation Phase: A citizen survey will be sent to the neighborhood within six (6) months after implementation of a Level 1 Traffic Calming Device. Public Works Department staff will perform a follow-up study six (6) months after implementation of a Level 2 or 3 Traffic Calming Device. The survey will be the same survey as the post implemented Level 1 traffic calming survey. The survey includes the following three questions:

- 1) Are you satisfied with the results of the Traffic Calming Project?
- 2) Did the Traffic Calming Project fix the problem? Score from 1 to 5.
- 3) Describe any problems seen since the implementation of the Traffic Calming Project.

Summary:

The Neighborhood Traffic Management Program is a process that allows for open lines of communication with the Traffic Engineering Division and the neighborhood. The level approach allows for quicker more visible traffic calming devices to be implemented and evaluated. If the problem persists more involved traffic calming measures may be implemented. The first step of any traffic calming process is to acquire 10 signatures (2 per household) on the petition Neighborhood Traffic Management Program Request for Traffic Calming on page 14 and submit the form to the:

City of Columbia, Public Works Department
701 E. Broadway
Columbia MO 65201.

Questions – Call 874-7250.

Appendix

Neighborhood Traffic Management Program Request for Traffic Calming Petition

We, the undersigned, owners of property abutting: _____

do hereby petition the Public Works Department to take action as may be necessary to initiate a traffic calming project. Action may include speed studies, cut-through traffic studies, collision data information gathering, and other data gathering as appropriate.

Please indicate the type and location of traffic related concern in your neighborhood:

*Name in line number 1 will be assumed the main point of contact throughout the project

#	Name	Address	Phone #	E-mail	Signature
*1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

*Name in line number 1 will be assumed the main point of contact throughout the project

#	Name	Address	Phone #	E-mail	Signature
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

Petition for Comprehensive Traffic Calming

This form is designed to help you evaluate your street, and to indicate if you support the City investigating potential traffic calming devices on your street. The information you supply is also crucial for helping the City understand and define specific problems. Please answer the questions below and mail this sheet by following the instructions on the back. Your survey will not be counted if you do not return this form indicating your decision.

Name of Observer: _____

Are you in favor of the City investigating potential comprehensive (Level 2 or 3) traffic calming devices?

- ☐ Yes
- ☐ No

Address: _____

Age:

- ☐ 18-40
- ☐ 41-64
- ☐ 65+

Are you a (Check all that apply)

- ☐ Pedestrian
- ☐ Motorist
- ☐ Bicyclist
- ☐

Phone Number: _____

E-mail Address: _____

Please indicate the number that best describes conditions in your neighborhood:

	Not a Problem	Somewhat a Problem	Serious Problem		
	1	2	3	4	5
Safety of children playing in or near the street due to speeding cars	0	0	0	0	0
Pedestrian Safety	0	0	0	0	0
Backing out of driveways (hard due to speeding cars)	0	0	0	0	0
Careless drivers	0	0	0	0	0
Speeding cars	0	0	0	0	0
Cut-through traffic	0	0	0	0	0
Parking	0	0	0	0	0
Traffic Noise	0	0	0	0	0
Street Width	0	0	0	0	0

The City's NTMP and calming policies can be viewed at:

http://www.gocolumbiamo.com/PublicWorks/documents/Engineering/traf_calm.pdf

Frequently Asked Questions- FAQ:

What is the speed limit on my street?

The City of Columbia code of ordinances set the speed limits for streets in ordinance number 14-223. If your street is not specifically called out in this document, assuming it's a residential street the speed limit is 25 mph.

Can we simply reduce the speed limit to slow speeding traffic?

No. The City of Columbia has set the posted speed limit to maximize safety by taking into consideration, road characteristics, traffic mix, collision history, and road function. Lowering a speed limit by only changing speed limit signs can increase accidents.

Why can't stop signs be installed?

Stop signs are considered traffic control devices and not traffic calming measures. They are intended to control the flow of traffic at an intersection and assign right-of-way. Traffic noise and speeds may increase with the introduction of a stop sign. Standard engineering thresholds are applied to determine if a stop sign is "warranted." Unwarranted stop signs are more likely to be ignored by motorists and lead to increased collisions.

Are traffic circles and roundabouts the same thing?

No. **Roundabouts** are large islands often used instead of a traffic signal at an intersection of larger (non-residential) roadways. Roundabouts require entering traffic to yield to traffic already in the circle. Roundabouts use splitter islands to channel entry to the roundabout.

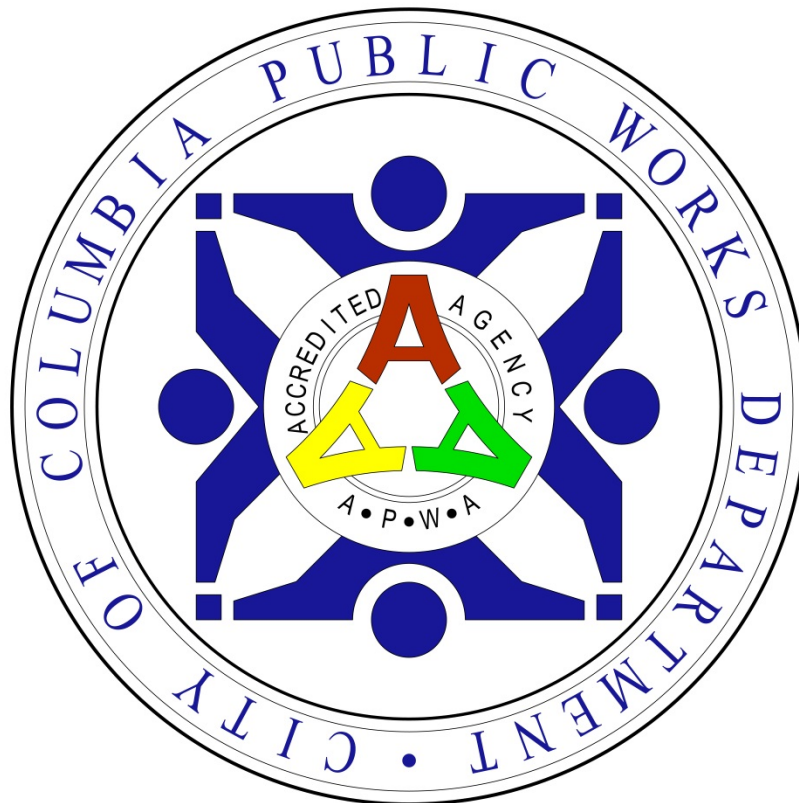
Traffic circles are a small raised island located in the center of an intersection. These are sometimes used in residential areas and prevent drivers from speeding through the intersection by impeding the straight-through movement.

Why only 10 points for Collisions?

Collisions are analyzed separately – if there are significant collision rate issues, steps will be taken to rectify the root cause(s) of the collisions outside the Neighborhood Traffic Management Program.

Traffic Calming Guidebook

Explanation of Traffic Calming Devices and When to Use Them



City of Columbia Public Works Department
701 East Broadway
Columbia, MO 65201
573-874-7250

Traffic Calming Guidebook

City of Columbia Public Works Department

This guidebook is designed to assist residents and community leaders by increasing their knowledge base of tools that may be used to calm traffic.

Traffic calming devices come in all shapes and sizes, from the subtle to the very aggressive. Each device has appropriate applications, limitations, advantages, disadvantages and costs associated with it. This guidebook will try to explain the when, where, why, and how of each traffic calming device.

First the problem must be correctly identified. Once the problem is identified the proper traffic calming device may be selected to counteract the problem. Some traffic calming devices address speed reduction while other may be more suited to address volume reduction. It's important to select the correct device for the appropriate problem.

The Traffic Calming Guidebook should be used in conjunction with the Neighborhood Traffic Management Program. The Guidebook will discuss traffic calming devices, what they are, where they should be placed, and advantages and disadvantages of each. The Neighborhood Traffic Management Program at:

<http://www.gocolumbiamo.com/PublicWorks/Streets/index.php>

Throughout the guidebook a general Price Scale will be utilized. The Scale is as follows:

\$\$\$\$\$ less than \$1,000

\$\$\$\$ between \$1,000 - \$5,000

\$\$\$ between \$5,000 - \$10,000

\$\$\$\$ between \$10,000 - \$25,000

\$\$\$\$\$ typically greater than \$25,000

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Level 1 Traffic Calming Devices (Increase Safety)

Level 1 traffic calming devices are intended to address safety concerns and can be implemented quickly. These traffic control devices and programs are intended to regulate, warn, guide, inform, enforce, and educate drivers, bicyclists, and pedestrians. These traffic calming devices include standard striping and signing elements, minor roadway design elements to improve visibility and safety, as well as, enforcement by police and safety education programs. These devices are the least intrusive, but could create a behavioral change resulting in a higher quality of life in the neighborhood.

Pavement Markings

Description: Stop bars, yield bars, turn arrows, delineators, lane markings, crosswalks, etc...

Purpose: To delineate and to transmit to motorists, bicyclists, and pedestrians important information necessary to safely travel upon the City's street.

Advantages:

- Quick application
- Relatively easy to install

Tradeoffs:

- Maintenance cost
- Not visible when snow covered

Cost: \$\$\$\$\$ - \$\$\$\$\$



Radar Trailer

Description: Portable radar speed trailer capable of measuring vehicles speed and displaying the speed of the driver.

Purpose: To educate residents and drivers about vehicle speeds

Advantages:

- Effective for temporary speed reduction
- Effective public relations tool
- Educational tool

Tradeoffs:

- May not change long term habits
- Effects speeds only in area of trailer

Cost: \$\$\$\$\$



High-Visibility Speed Limit Signs

Description: High Visibility signs may include larger speed limit signs with a yellow border with the phrase “SET THE PACE,” or “KID FRIENDLY” or similar wording. These signs create awareness of the neighborhood and inform the motorists of the speed.

Purpose: To create a visual reminder to the motorists of the speed through the neighborhood. The co-funding aspect makes the speed limit signs more attainable to the neighborhood. “KID FRIENDLY” or “SET THE PACE” reminds motorists they are driving through a residential neighborhood.

Advantages:

- Provides a clear definition of legal speed limit or other warnings
- Provide context for enforcement efforts

Tradeoffs:

- Not-self enforcing

Cost: \$\$\$\$\$



Neighborhood Speed Watch

Description: Residents use radar equipment to identify speeding vehicles.

Purpose: To raise awareness of the posted speed limit, educate drivers about vehicle speeds, and allow resident to take an active part in the program. This program does not issue citations or tickets.

Advantages:

- Increases driver awareness in regards to speeds in the neighborhood
- Educates the neighborhood about the speed limit
- An effective public relations tool

Tradeoffs:

- Not an enforcement tool
- May not change long term habits

Cost: \$\$\$\$\$



Police Enforcement

Description: Increased enforcement of speed limits on residential streets. Police presence to monitor speeds and issue citations.

Purpose: To reduce traffic speed and increase traffic safety.

Advantages:

- Effective for temporary speed reduction while officer is present

- Can be targeted at specific times

- Targets violators without affecting normal traffic

- Increases driver awareness of speed limit

Tradeoffs:

- May not change long term habits

- Enforcement limited by police availability and other policing duties

- May not be repeatable as often as desired

Cost: \$\$\$\$\$



Restricted Movement Signing

Description: Sign that prohibits certain movements at an intersection. Used in special circumstances.

Purpose: To increase traffic safety.

Advantages:

- Redirects traffic to main streets
- Reduces volume
- Addresses time-of-day problems

Tradeoffs:

- May increase trip length for some drivers
- No significant effect on vehicle speeds

Cost: \$\$\$\$\$



One-Way Sign

Description: Directional movement sign that limits the direction of travel. Used in special circumstances.

Purpose: To indicate to drivers that traffic is allowed to travel only in a certain direction. When used as a comprehensive traffic calming measure, the intent to limit or reduce through traffic along a street.

Advantages:

Intersection conflicts are reduced as there are fewer turning movements.
Reduction in traffic volume

Tradeoffs:

May increase speeds

Cost: \$\$\$\$\$



Level 2 Traffic Calming Devices (Reduce Speed)

Level 2 traffic calming devices are intended to address speeding/safety concerns with devices that go beyond Level 1 traffic calming. These traffic calming devices are designed to primarily slow down traffic within residential areas. They are employed when the use of Level 1 traffic calming devices were not effective in reducing speeds.

Many of the Level 2 traffic calming devices include horizontal or vertical deflection. Horizontal deflection can be achieved two different ways. The first hinders the driver's ability to drive in a straight line by creating a horizontal shift in the roadway. This shift forces drivers to slow down in order to safely navigate. The second is designed to narrow the width of the travel lane. A narrower travel lane reduces the usable surface of the roadway causing drivers to slow down to maintain an acceptable level of comfort.

Vertical deflection changes the height of the roadway, essentially having the driver drive over a designed device in order to slow the driver. When properly designed the driver will slow down in order to avoid an unpleasant bumping sensation.

Speed Hump

Description: Speed humps are an area of pavement raised 3-6 inches in height over a minimum of 12 feet in length. The combination of different height, lengths and approach ramps will vary the speed a vehicle can comfortably go over the hump. They are accompanied with signs and pavement markings.

Purpose: To reduce vehicle speed.

Advantages:

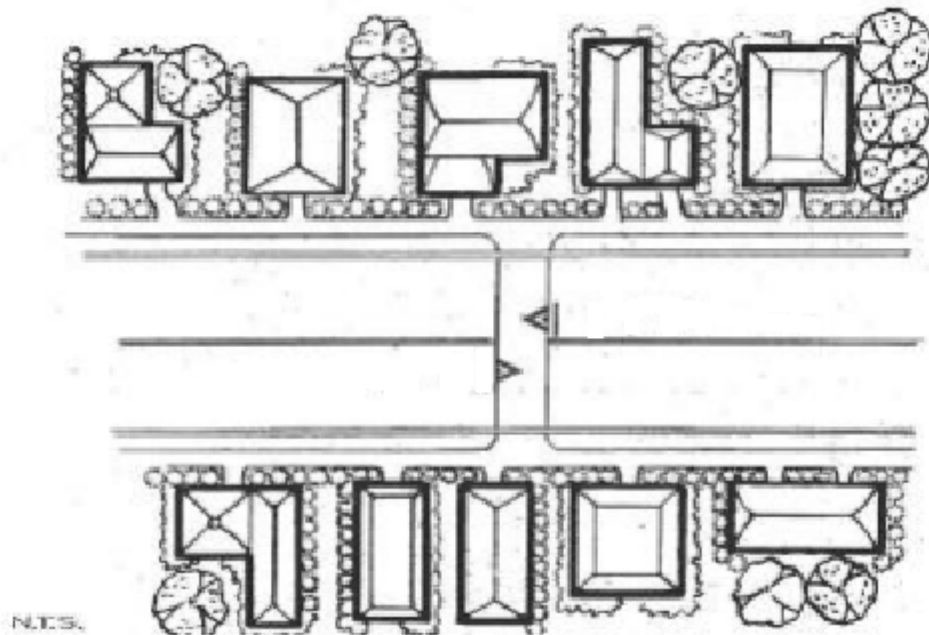
- Slows traffic
- Self enforcing
- Requires minimal maintenance
- Minimal impact on snow removal

Tradeoffs:

- Slightly increases emergency response times
- May increase traffic noise in vicinity of speed hump
- May disrupt drainage paths
- More disruptive on larger vehicles
- Accompanied by signs and some parking modifications

Cost:

\$\$\$



Raised Crosswalk

Description: Flat topped speed hump built as a pedestrian crossing

Purpose: To reduce vehicle speed mid-block and improve pedestrian safety

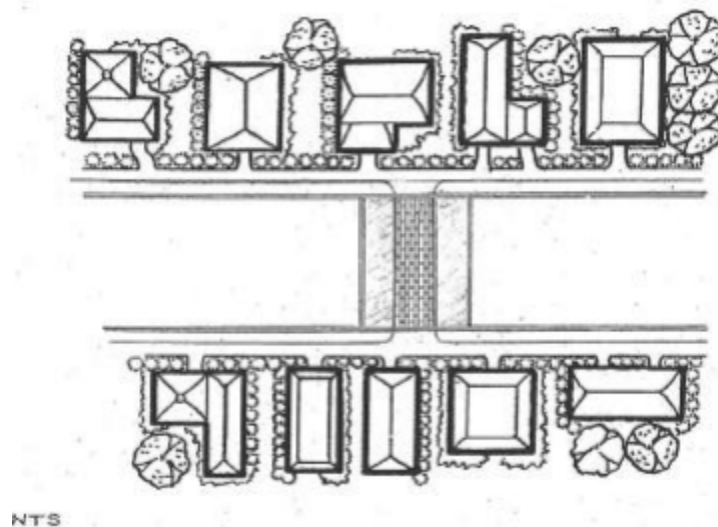
Advantages:

- Slows traffic
- Requires minimal maintenance
- Minimal impact on snow removal
- Increases pedestrian visibility in the crosswalk
- Clearly designates the crosswalk

Tradeoffs:

- Slightly increases emergency response times
- May increase traffic noise in vicinity of raised crosswalk
- May disrupt drainage paths
- More disruptive on larger vehicles
- Typically involves drainage modifications

Cost: \$\$\$\$



Speed Table

Description: Speed tables are raised intersections with a flat section in the middle and ramps on the ends.

Purpose: To reduce vehicle speed.

Advantages:

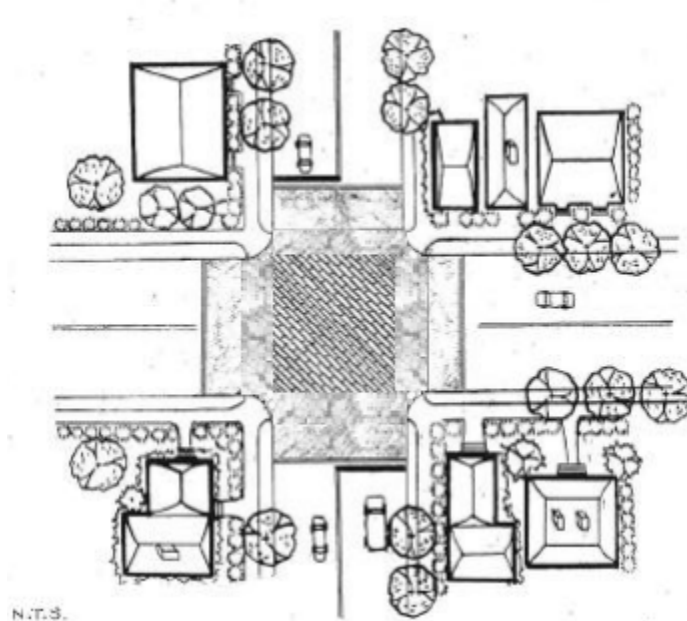
- Slows traffic
- Self enforcing
- Requires minimal maintenance
- Minimal impact on snow removal

Tradeoffs:

- Slightly increases emergency response times
- May increase traffic noise in vicinity of speed table
- May disrupt drainage paths
- Accompanied by signs and some parking modifications

Cost:

\$\$\$\$-\$\$\$\$\$



Median

Description: Raised island in the center of the roadway.

Purpose: To reduce vehicle speed and interrupt sight distance down the center of the roadway.
Can be used to deflect vehicle path.

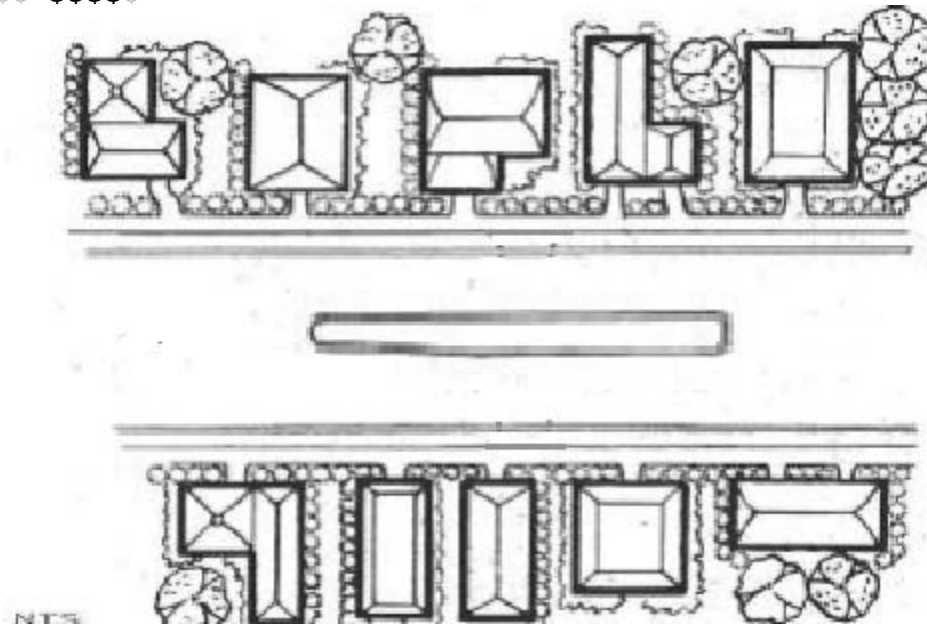
Advantages:

- Narrowed travel lanes encourage slower vehicle speeds
- Opportunity for landscaping
- Can utilize space which otherwise would be less used pavement
- Can be used to control access

Tradeoffs:

- May interrupt driveway access and result in U-turns
- May require removal of parking
- Long medians may interrupt emergency access and operations
- Might adversely impact bicyclist comfort

Cost: \$\$\$\$- \$\$\$\$\$



Entry Island/Islands

Description: A raised section of a two-way street that identifies the entrance to a neighborhood.

Purpose: To reduce vehicle speed and interrupt sight distance down the center of the roadway, while also establishing a gateway to the neighborhood.

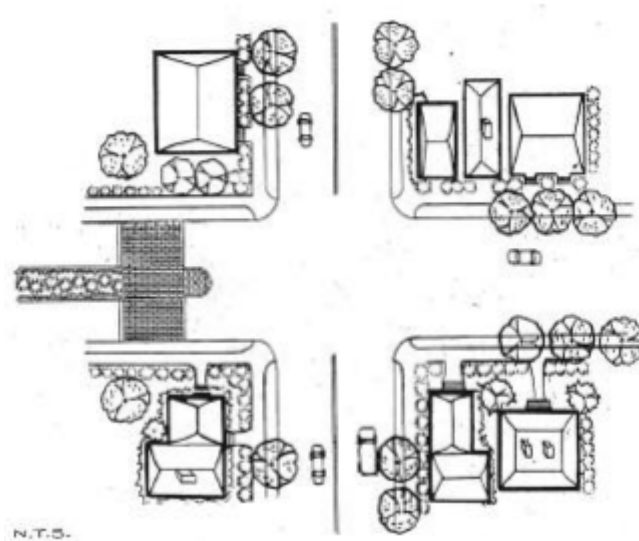
Advantages:

- Notifies drivers of change in roadway character
- Reduces speed
- Opportunity for landscaping
- May discourage volume

Tradeoffs:

- Need for maintenance
- May necessitate removal of parking
- May impact snow removal operation

Cost: \$\$\$\$- \$\$\$\$\$



Chicanes

Description: Curb extensions that alternate from one side of the street to the other forming curves

Purpose: To reduce vehicle speed using horizontal deflection

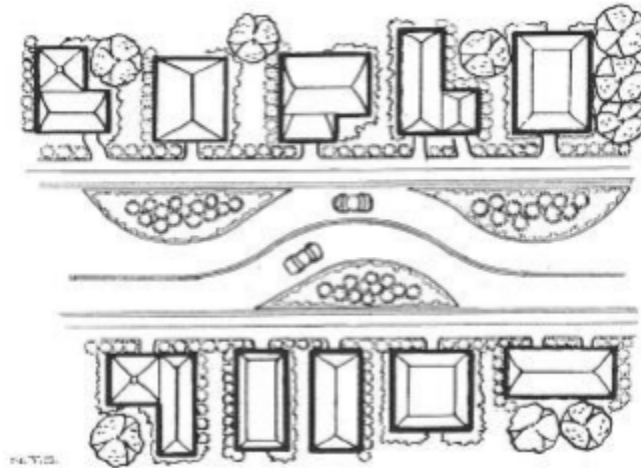
Advantages:

- Can be aesthetically pleasing
- Reduces speed
- Opportunity for landscaping

Tradeoffs:

- May increase conflicts between drivers, bicyclists, and pedestrians
- Increases emergency response times
- May necessitate removal of parking

Cost: \$\$\$\$\$



Chokers

Description: Raised islands on one or both sides of the roadway creating a narrower roadway.

Purpose: To reduce vehicle speed

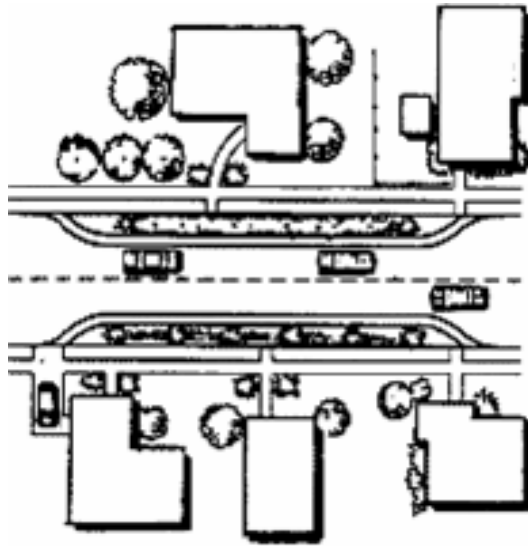
Advantages:

- Reduces vehicle speed
- Reduces crossing distance for pedestrians
- Breaks up drivers line of sight

Tradeoffs:

- May create problems with maintenance and snow removal
- May necessitate removal of parking
- May reduce cyclist comfort

Cost: \$\$\$\$\$



Curb Extensions

Description: Intersections where curbs are extended toward the center of the roadway.

Purpose: To slow traffic at intersections and improve pedestrian safety

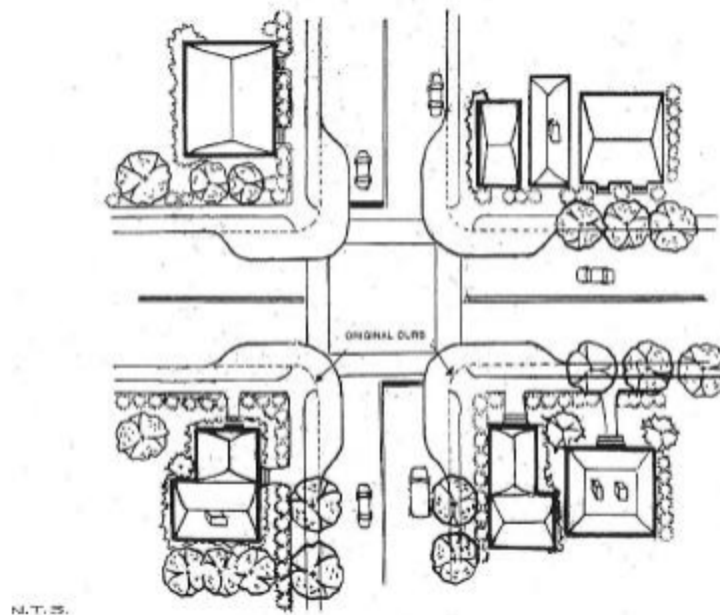
Advantages:

- Reduces vehicle speed
- Reduced crossing distance for pedestrians
- Breaks up drivers line of sight

Tradeoffs:

- May impact drainage paths
- May necessitate removal of parking
- Will likely involve drainage modifications
- Can impede truck movements

Cost: \$\$\$\$\$



Raised Intersection

Description: A raised section of roadway at an intersection where the pavement is elevated flush with the curb and the approaches are ramped like speed humps.

Purpose: To slow traffic at intersections and improve pedestrian safety

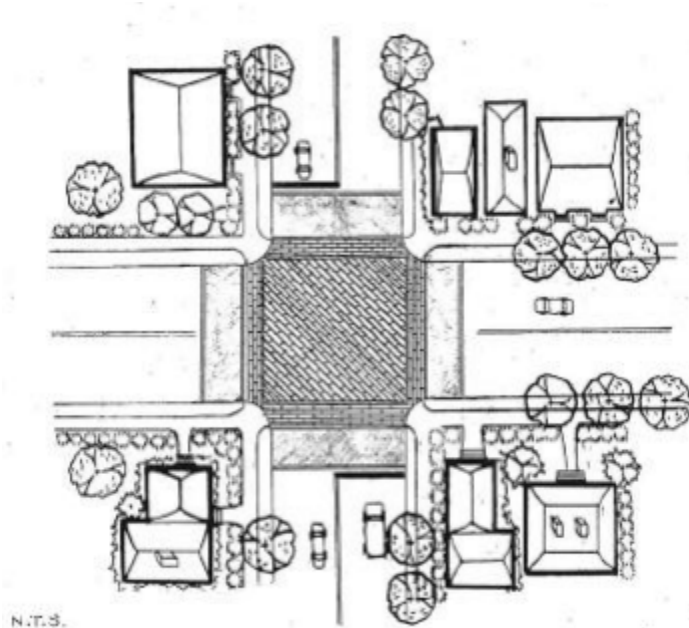
Advantages:

- Reduces vehicle speed
- Improved pedestrian safety
- Highlights intersection

Tradeoffs:

- May impact drainage paths
- May increase emergency response times
- May increase turning difficulty
- May be more disruptive for large vehicles
- May increase noise

Cost: \$\$\$\$\$



Realigned Intersections

Description: Realigns T-intersection to make the “through movement” a turning movement.

Purpose: To slow traffic at intersections and redirect traffic

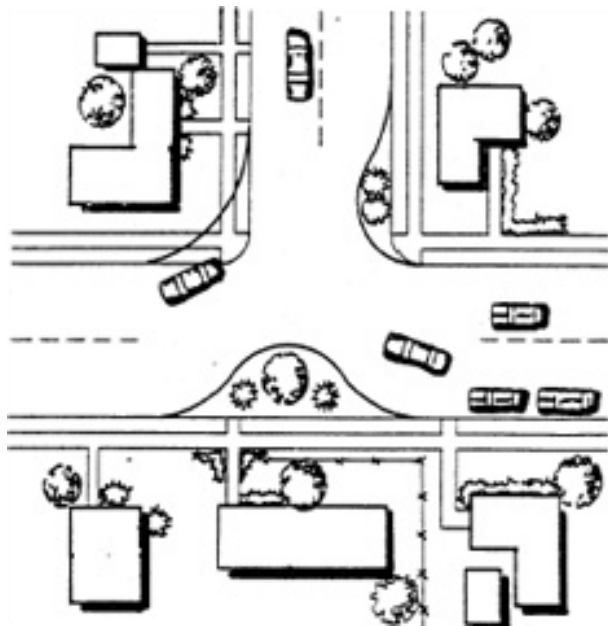
Advantages:

- Provides landscaping opportunity
- Discourages traffic continuing through a neighborhood
- Slows traffic as it enters a neighborhood
- Breaks up line of sight

Tradeoffs:

- May impact drainage paths
- May increase emergency response times

Cost: \$\$\$\$\$



Traffic Circle

Description: Traffic circles are raised circular medians in an intersection. Vehicles must change their travel path to maneuver around the circle.

Purpose: To slow traffic at intersections.

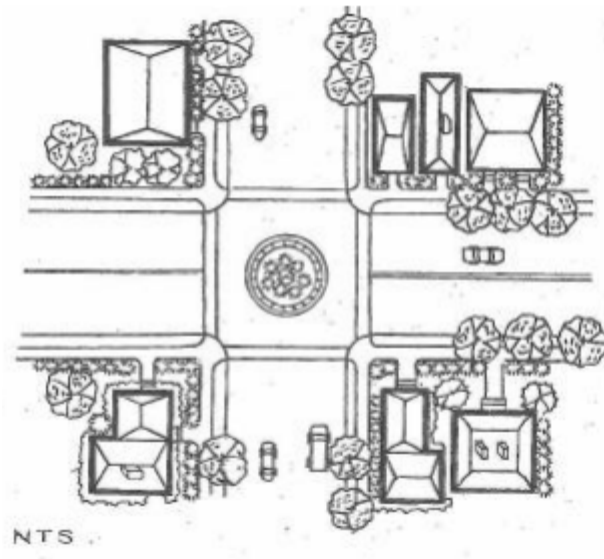
Advantages:

- Provides landscaping opportunity
- Breaks up line of sight

Tradeoffs:

- Increases emergency response times
- May impede left turns by large vehicles
- Increases maintenance costs
- May impact snow removal operation
- May require driver education due to similarities with round-a-bouts
- Driver expectation issues due to similar look of a round-a-bout but different design characteristics

Cost: \$\$\$\$\$-\$\$\$\$\$



Level 3 Traffic Calming Devices (Reduce Volume)

Level 3 traffic calming devices are intended primarily to reduce the volume of traffic on certain streets and re-direct traffic back to the main streets. These traffic control devices are intended to reduce cut-through traffic from using residential streets. Level 3 traffic control devices may be used in conjunction with Level 1 and Level 2 traffic control devices. Level 3 devices tend to impact the neighborhood residents the most, but also can impact a substantial amount of the general public. Use of Level 3 devices should be approached with caution.

Restricted Movement Barrier

Description: Barrier island that prevents certain movement at an intersection.

Purpose: To redirect traffic a certain direction.

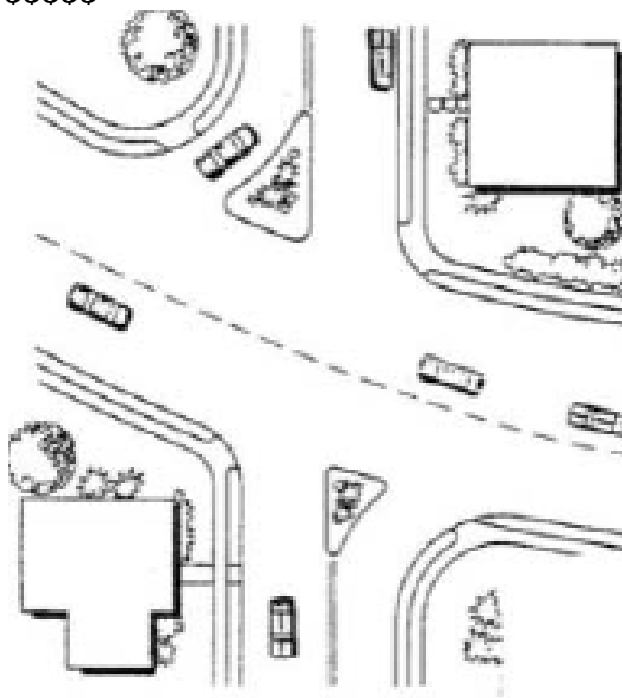
Advantages:

- Redirects traffic to main streets
- Reduces volume
- Provides landscaping opportunity

Tradeoffs:

- Increases emergency response times
- May increase trip length for some drivers
- Increased maintenance costs

Cost: \$\$\$\$\$-\$\$\$\$\$



Entrance Barrier/Half Closure

Description: Physical barrier that restricts turns into or from a street. The opposite lane is left open to allow vehicles to exit (or enter). Two-way traffic is maintained for the rest of the block.

Purpose: To reduce traffic volume

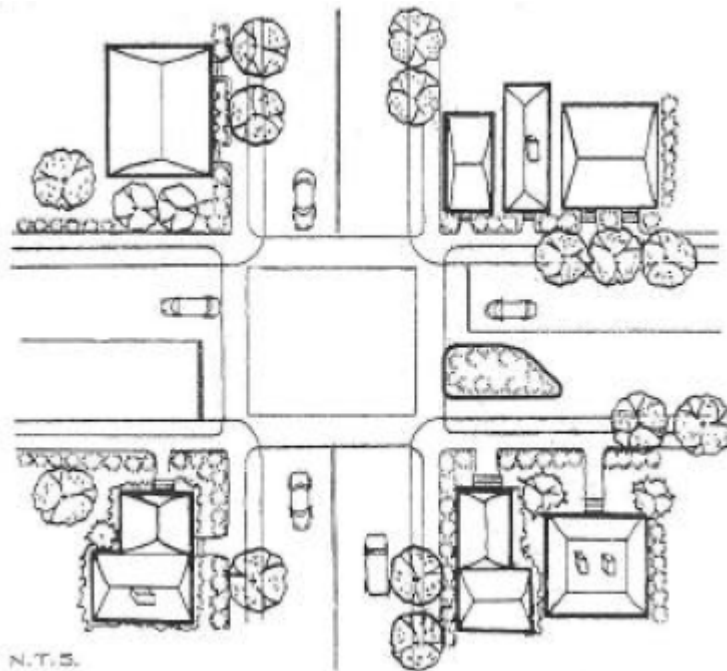
Advantages:

- Restricts movements into (or exit from) a street
- Reduces volume
- Provides landscaping opportunity

Tradeoffs:

- May redirect traffic to other local streets
- May increase trip length for some drivers
- In effect at all times even if cut-through problem exists only at certain times of day
- Increases emergency response times
- May result in parking modifications

Cost: \$\$\$\$



Diagonal Diverter

Description: Barriers placed diagonally across an intersection blocking through movement.

Purpose: To reduce traffic volume

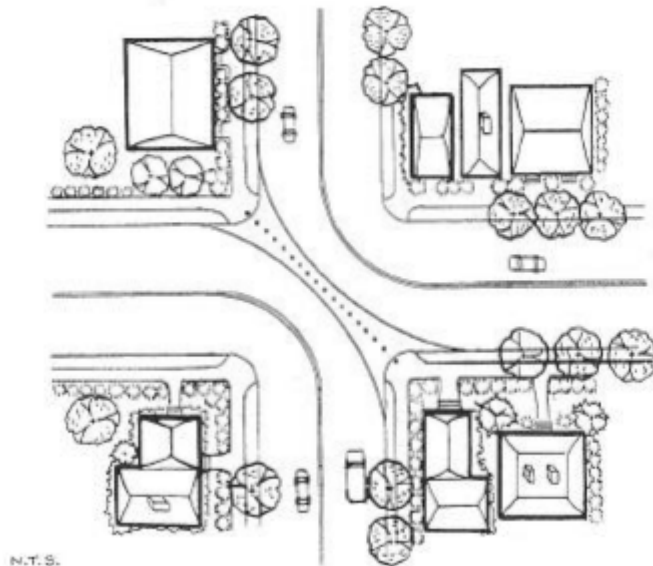
Advantages:

- Reduces volume
- Provides landscaping opportunity
- Can be designed to preserve emergency vehicle access

Tradeoffs:

- May redirect traffic to other local streets
- May increase trip length for some drivers
- In effect at all times even if cut-through problem exists only at certain times of day
- Impacts emergency response time

Cost: \$\$\$\$\$



Full Closure

Description: Full closure of a street.

Purpose: To reduce traffic volume

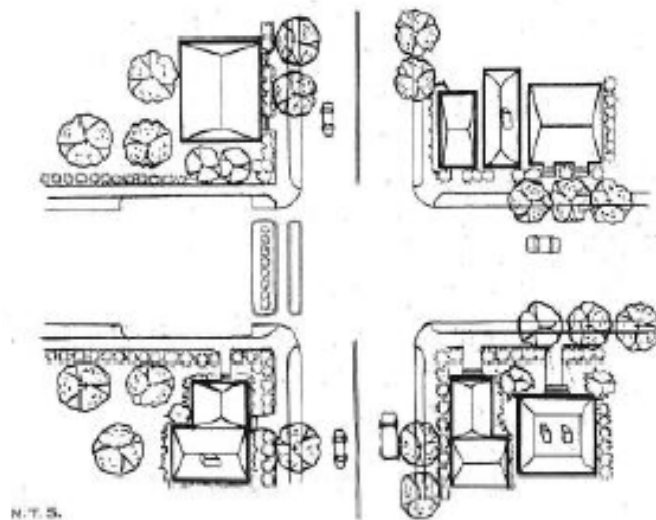
Advantages:

- Reduces volume
- Self enforcing

Tradeoffs:

- Redirects traffic to other local streets
- May increase trip length for some drivers
- In effect at all times even if cut-through problem exists only at certain times of day
- Increases emergency response times
- Most intrusive
- Reduces connectivity

Cost: \$\$\$\$



Open Road Closure

Description: Raised area of pavement in the roadway with a hole in the middle for bicycle and pedestrian access. Raised areas have a ramp to allow for larger vehicles to mount the pavement accompanied with “DO NOT ENTER” signs.

Purpose: To reduce traffic volume

Advantages:

- Reduces volume

- Preserves connectivity for emergency response and some other users

Tradeoffs:

- Use depends on driver behavior

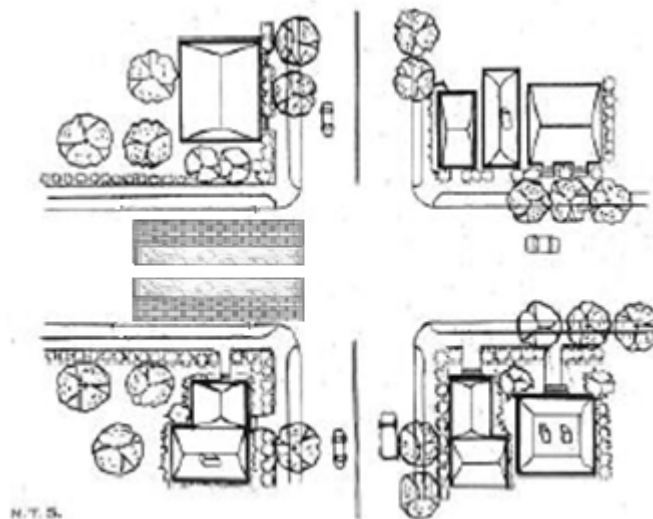
- Increases trip length

- In effect at all times even if cut-through problem exists only at certain times of day

- Reduces connectivity

Cost:

\$\$\$\$\$-\$\$\$\$\$



Neighborhood Speed Watch Program

Guide to Raising Awareness of Neighborhood Speed Limits



City of Columbia Public Works Department
701 East Broadway
Columbia, MO 65201
573-874-7250

Neighborhood Speed Watch Program

City of Columbia Public Works Department

Speeding drivers on residential streets can be a common concern received by the City of Columbia. The City's Neighborhood Speed Watch Program encourages neighborhood residents to become involved in assessing this problem, and is a part of Columbia's new Neighborhood Traffic Management Program.

The Neighborhood Speed Watch Program is a public awareness program in which concerned citizens can take an active role in solving the problem of speeders in their own neighborhoods. City residents record speeds and report the speeds back to the City. This creates awareness of the speed limit in the neighborhood.

Often, drivers who speed through neighborhoods are unaware of the effect their actions have on the peace and safety of neighborhood streets. Education of the posted speed limit encourages drivers to slow down. No formal citations or fines are issued.

How the Program Works

- 1) Citizens who wish to take part in this program as part of the Neighborhood Traffic Management Program first need to complete a petition letter (found at the end of document) with at least 10 signatures from the neighborhood. Return the completed petition to City of Columbia Public Works Department.
- 2) Citizens agreeing to participate in the program are briefed on the requirements and expectations of them. They are instructed in the use of radar equipment, proper data collection and appropriate behavior while conducting the data collection.
- 3) A radar unit is loaned out to the citizens. This is typically a team effort one person in the group is responsible for operating the radar unit; another person records the required information on a City of Columbia Neighborhood Speed Watch Form.
- 4) Once all data collection is completed, the neighborhood residents return the radar unit and all report forms to:

*City of Columbia Public Works Department
701 E. Broadway
Columbia, MO 65201*

Neighborhood Speed Watch Rules of Conduct

- ✓ *Two volunteers are required at all times during the speed watch.*
- ✓ *Volunteers must be 16 years of age or older to participate.*
- ✓ *Volunteers under the age of 21 must be accompanied by an adult 21 years or older.
This allows high school and college students to participate in the program.*
- ✓ *Obey all traffic and pedestrian laws*
- ✓ *Be courteous and exercise reasonable care*
- ✓ *Neighbors, pedestrians, and motorists may stop to ask what you are doing. If they have objections to the program they may call the City of Columbia Public Works Department at 874-7250. If a confrontation arises, stop the study immediately and contact the police. Do not argue and remain calm.*
- ✓ *The public may incorrectly assume that you are a representative of the City or a law enforcement officer, or that your actions will result in them receiving a traffic citation. You must make it clear that you are volunteering as a private citizen and participating the Neighborhood Speed Watch Program.*
- ✓ *Do not make gestures or verbal comments toward passing vehicles.*
- ✓ *Do not chase, attempt to stop, or apprehend drivers.*
- ✓ *Do not encourage non-participants to be present.*
- ✓ *Only those persons who have been instructed in the use of the radar equipment may participate in the speed watch. Crowds of people will only draw attention to the speed watch and are counterproductive.*
- ✓ *Accurately collect and record data.*
- ✓ *If you are interested in participating in the Neighborhood Speed Watch Program or have questions, call City of Columbia Public Works Department at 874-7250.*

City of Columbia Radar Unit Loan and Usage Agreement

Name

Address

Phone Number

Understand that:

The radar unit and associated accessories, as listed below, have been loaned to me by the City of Columbia Public Works Department, as provided in the Neighborhood Speed Program for use on

_____, 20_____ through _____, 20_____

Radar Units _____

Clip Board _____

Other _____

The radar unit, which has been loaned to me, is a delicate instrument and must be handled carefully and with caution. I will be responsible for protecting it and returning it in good working order. I will use this device only on the dates and in the manner agreed to with the City of Columbia Public Works Department.

As operator, I am not a City employee or a law enforcement officer and will not communicate or seek to communicate by my actions or speech that I am. I am volunteer and responsible for my own action during the time I am participating in a speed watch.

In addition to myself, only those persons completing this form (separate copy) will be allowed to use the above named equipment or allowed to assist in the collection of speed watch data.

Radar Unit Loan and Usage Agreement/Rules of Conduct

As a participant in the Neighborhood Speed Watch Program, I have read and understand the Rules of Conduct and agree to abide by them. I am a volunteer and not a City employee. I further agree to take full responsibility for my action during the time I am participating in a speed watch. I will not use the radar unit in any other neighborhoods or streets than listed below. I have been informed in the use of the radar equipment and agree to abide by these rules and follow these instructions.

The radar unit will be returned on or before: _____

To the City of Columbia Public Works Department

I will be conducting a speed watch in the neighborhood of : _____

or on the streets of: _____

Signed: _____

Date

Below For Staff Use Only

The above named person received training in the use of the radar unit and data collection, and was instructed on the programs Rules of Conduct.

Signed: _____

Date

Neighborhood Speed Watch Report Form

Observer: _____ Date: _____

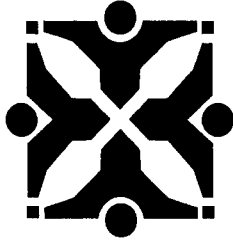
Start Time: _____ End Time: _____ Speed Limit: _____

Street Name: _____ Weather: _____

Cross Street: _____ between _____

	Speed	Direction (NB, EB, SB, WB)		Speed	Direction (NB, EB, SB, WB)
1			26		
2			27		
3			28		
4			29		
5			30		
6			31		
7			32		
8			33		
9			34		
10			35		
11			36		
12			37		
13			38		
14			39		
15			40		
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23			48		
24			49		
25			50		

Page _____ of _____



Source: Public Works

John

Agenda Item No:

To: City Council
From: City Manager and Staff

MM

Council Meeting Date: Nov 4, 2013

Re: Traffic Calming Policy Revision

EXECUTIVE SUMMARY:

Staff has prepared for Council consideration legislation in the form of a Policy Resolution concerning the revisions to the Traffic Calming Policy. This report highlights changes to the policy and recommends adoption of the Neighborhood Traffic Management Program.

DISCUSSION:

The current Traffic Calming Policy was written in 1999, and should be revised to reflect changes in the industry and lessons learned since. A Neighborhood Traffic Management Program (NTMP) is being proposed. The NTMP will be transparent, data driven, utilize evaluation techniques, and provide a single annual report.

The proposed NTMP will utilize the "Levels" approach to traffic calming. Level 1 devices are meant to be quick and visible, while Level 2 devices are meant to reduce speed, and Level 3 devices are intended to reduce traffic volume. While the City has completed numerous traffic calming projects over the years, the Level approach is intended to allow customers to be served in a quicker fashion. With the NTMP and recent changes to our street standards to include curvilinear streets, the number of projects and time spent on projects should decrease.

The following documents are attached to this report:

Traffic Calming Guidebook
Neighborhood Traffic Management Policy
Policy Resolution
Existing Traffic Calming Policy
Neighborhood Speed Watch Program
Map of existing traffic calming requests
Map of existing traffic calming implementations

Level 1 notable techniques are the Neighborhood Speed Watch Program and the co-funding of speed limit signs. The Neighborhood Speed Watch Program will allow the City to loan out radar devices to citizens. It should be noted that no license information will be recorded in the program, it is purely to raise awareness and gain information. The co-funding of speed limit signs will allow the "Kid Friendly," "Set the Pace," or similarly worded speed limit signs to be installed in more areas, as the neighborhood and City will split the cost 50/50.

After a Level 1 project is completed, a short three question survey will be sent out to verify if the problem was addressed. With positive evaluations, the project may be closed out. There will be a longer time period for Level 2 and 3 projects as we work towards acceptable alternatives.

The NTMP will utilize a scoring system to rank the priority of Level 2 and 3 projects. The scoring system is based on volume, speed, collisions, bicycle routes, proximity to schools, and pedestrian generators. The ranking will be provided to Council in an annual report, which will have sufficient information to select traffic calming projects to be implemented within the next year. If this policy is adopted the first annual report will follow subsequently.

FISCAL IMPACT:

None

VISION IMPACT:<http://www.gocolumbiamo.com/Council/Meetings/visionimpact.php>

Strengthen enforcement of ordinances that contribute to environmental soundness and sustainability, and those that safeguard neighborhoods against physical decay.

Columbia will have diverse travel options that allow for safe and efficient travel to and through destination points. Travel options will be compatible with adjacent land uses and coordinated with the transportation timing needs of the community.

SUGGESTED COUNCIL ACTIONS:

If Council agrees with staff recommendation to replace the Traffic Calming Policy with the Neighborhood Traffic Management Program, the policy resolution should be approved.

FISCAL and VISION NOTES:					
City Fiscal Impact Enter all that apply		Program Impact		Mandates	
City's current net FY cost	\$0.00	New Program/ Agency?	Yes	Federal or State mandated?	No
Amount of funds already appropriated	\$0.00	Duplicates/Expands an existing program?	No	Vision Implementation impact	
Amount of budget amendment needed	\$0.00	Fiscal Impact on any local political subdivision?	No	Enter all that apply: Refer to Web site	
Estimated 2 year net costs:		Resources Required		Vision Impact?	Yes
One Time	\$0.00	Requires add'l FTE Personnel?	Yes	Primary Vision, Strategy and/or Goal Item #	5.3
Operating/ Ongoing	\$0.00	Requires add'l facilities?	No	Secondary Vision, Strategy and/or Goal Item #	5.3.2, 13.2
		Requires add'l capital equipment?	No	Fiscal year implementation Task #	

TRAFFIC CALMING POLICY

A. Mission Statement

Public Works Department Traffic Calming Mission:

It shall be the mission of the Public Works Department to provide traffic calming solutions to vehicular uses of streets that adversely impact the neighborhood quality of life and the safety of the residents in that neighborhood.

The department will work closely with residents to properly identify the concerns, conduct appropriate studies to quantify any problems and develop options for dealing with the quantified problems.

B. Traffic Calming Procedure

Traffic Calming is the application of techniques at a specific location which result a reduction in vehicular speeds, traffic volumes, traffic noise and accidents. The techniques may include educational programs, neighborhood speed watch programs, improvements in traffic signing, increased enforcement, reduction of speed limits or physical alterations to the roadway to change driving patterns. The support of the residents where traffic calming is being considered is critical to the success of any neighborhood traffic management program and they must therefore be an integral part of any process.

It is the goal of the Public Works Department to achieve solutions to traffic related problems in a manner least intrusive to the neighborhood. To accomplish this goal, the department has developed this procedure to assure a systematic and comprehensive approach to each situation.

A study is necessary in order to determine if there is a traffic concern which can be effectively addressed by installing traffic calming practices. The two most common concerns the program addresses are speeding and cut through traffic in residential areas.

A study can be initiated by one of the following methods.

- a. A neighborhood association or citizen group may request a study by letter to the Public Works Department.
- b. The Director may authorize a study of a traffic problem area identified by city staff.
- c. The City Council may direct staff to conduct a study.

Upon receipt of a request or a direction to conduct a study, the Public Works Department will make a preliminary site visit and review available data, including accident reports to determine if there is a readily apparent safety problem. Speed studies and traffic volume counts may also be conducted at this time. Should it be determined that the location is not appropriate for a traffic calming project requiring physical alterations to the roadway or that the concerns can be addressed in some other form, a meeting will be held with the party initiating the request or in the case of City Council directive, a report will be prepared

stating the conclusions and recommendations of staff. In the event that there is a justification for a major traffic calming project or there is specific direction to proceed with one, the following process will be followed.

1. Traffic Calming Study

- a. Efforts will be made to identify a key contact person in the neighborhood for purposes of communicating information and coordinating any neighborhood meetings
- b. The geographic area that would be impacted by modifications to traffic patterns will be identified.
- c. All residents and property owners within the identified impacted area, as well as the Police Department, Fire Department and Utility service providers will be contacted by letter advising them of the traffic calming study and surveyed as to their observation of any specific traffic related problems.
- d. Speed, traffic volume and accident investigations will be conducted, if not done in the preliminary evaluation, to determine the extent of safety problems.
- e. Site surveys will be made to inventory site specific information which may contribute to traffic concerns. Area inventory shall include review of visual obstructions, street grades, street widths, street network, sidewalk network, major thoroughfare plan, sidewalk and bicycle plans, existing traffic control, parking prohibitions, speed limits, school zones, and future CIP projects which may affect the traffic in the study area.
- f. A neighborhood meeting will be held inviting all persons in the identified area of impact and any neighborhood associations in the area. The purpose will be to present findings of the study and gather input as to desired actions to address concerns.
- g. A preliminary report will be prepared indicating results of studies, surveys, and resident requests. The report will contain staff recommendations for action and cost estimates. The preliminary report will be provided to residents and other impacted city departments for review and final comment prior to being submitted to Council.

2. Report to City Council

Upon completion of the report, it will be submitted to city council with a staff recommendation. The report will explain the results of the traffic calming study, indicate the presence of safety concerns and determine if warrants for installing Traffic Calming are met.

3. Traffic Calming Project Design

If a traffic calming project is authorized by city council, the traffic engineer will work with the neighborhood to develop a plan within the Traffic Calming Guidelines to address the traffic concerns which were warranted by the Traffic Calming Study.

4. Public Hearing

A public hearing will be held by the city council for the authorization to install the traffic calming project. Discussion will include: project design, goal, neighborhood involvement and endorsement, cost estimate, funding source, construction, and public discussion.

C. Criteria and Warrants for Installing Traffic Calming Practices

1. Conditions for Installation of Traffic Calming Practices

- a. Traffic calming devices may be installed by the City when the study clearly indicates a traffic problem does exist on the basis of excessive speeds, accidents or roadway design deficiencies. At least 50% of the residents of the impacted area must demonstrate support of the project by signature of a petition for projects of this nature.
- b. Traffic calming devices may be jointly installed by the City and residents of a neighborhood when a clearly identifiable traffic problem does not exist but there can be shown to be a general public benefit in the form of aesthetics or improved safety. At least 65% of the residents of the impacted area must demonstrate support of the project by signature of a petition for projects of this nature.
- c. Traffic calming devices may be installed by the residents of a neighborhood when there is no clearly identified traffic problem or public benefit provided the Director determines that the installation of the devices will not be detrimental to the general public. The traffic calming shall be installed under terms of a right of use permit approved by City Council. At least 75% of the residents of the impacted area must demonstrate support for projects of this nature by signature of a petition.
- d. Traffic calming devices shall not be allowed where no traffic problems are identifiable and the installation of the devices would inconvenience or potentially endanger the general public.
- e. No traffic calming device shall be installed or placed on any street without approval by the Director.

2. Criteria and Warrants- The necessity for traffic calming shall be based on the following warrants:

	Criteria	Warrant
1	Speed	85% Percentile Speed is 10 mph over posted speed limit
2	Volume	Cut through traffic exceeds 25 % of the total volume
3	Accidents	Accident history indicates 3 accidents in a 18 month period which can be corrected by installation of traffic calming.

When any of the warrants exist, traffic calming should be implemented. When any of the following conditions exist, traffic calming may be warranted if supported by the traffic study.

1	Elementary Schools	20-mph school zone on the project street
2	Pedestrian Generators	Public facility that generates a significant number of pedestrians on the street
3	Bicycle Routes	Street is a designated bicycle route
4	Transit Streets	Street is a designated transit route
5	Pedestrian Facilities	No continuous sidewalk on at least one side of the street

Traffic calming may also be warranted as alternative to all way stop controls and to correct a roadway design deficiency which can be addressed.

A. Guidelines for Installing Traffic Calming Practices

The objectives of traffic calming can frequently be met without physical changes to a roadway. The least intrusive solution is always the preferred one from a traffic engineering perspective. When engineered solutions are necessary, the following are most commonly applied and shall be in accordance with the guidelines established by the department.

1. **Speed Humps**- Speed humps are raised sections of the roadway constructed to reduce vehicular speeds. Similar to a speed bump, the speed hump is wider and has a more sloping side taper. The physical impact on passing vehicles is less severe at slow speeds than at higher speeds. Studies show that speed humps can reduce speeds by approximately five to six mph. Also, speed humps reduce vehicular speeds between intersections, something multi-way stops cannot address.

Speed humps may be used only on local residential streets where excessive speeding has been determined. Speed hump design and installation shall follow *The Guidelines for Design and Application of Speed Humps, a Recommended Practice of the Institute of Transportation Engineers.*

2. **Traffic Circles** - A traffic circle is a large circular area in the middle of an intersection meant to control the right-of-way of vehicles. The circle is used to decrease vehicular speeds on a residential street and may decrease traffic volume as well. Traffic approaching the intersection must drive around the circle and yield to those cars which have already entered the circle.

Designated either by markings or a curbed island, a traffic circle breaks-up a driver's line of sight. The driver is less sure of what to expect ahead and will generally lower his or her driving speeds. Traffic circles can also provide a refuge for pedestrians when they are crossing the street

Traffic circles may be used at four way intersections of local residential streets where a speeding problem has been determined or when an accident problem exists but does not meet warrants for a four way stop installation.

- 3. Chicanes**- A chicane is created by staggered curb extensions, that are placed on both sides of the street. These curb extensions alternate on the street and force motorists to substantially decrease their speed when driving around them. In addition, depending on the design, motorists may have to yield to oncoming traffic, when the curb extension is designed to allow only enough space for one car to pass at a time. The extensions, often landscaped with bushes and trees, decrease the driver's line of sight, and therefore, decrease the speed with which he or she can drive with comfort.

Chicanes can be costly to construct and because of the drastic physical changes to street characteristics, they need strong residential support. However, the drastic changes have a more immediate and forceful affect on decreasing speeding and through-traffic.

4. Project Evaluation

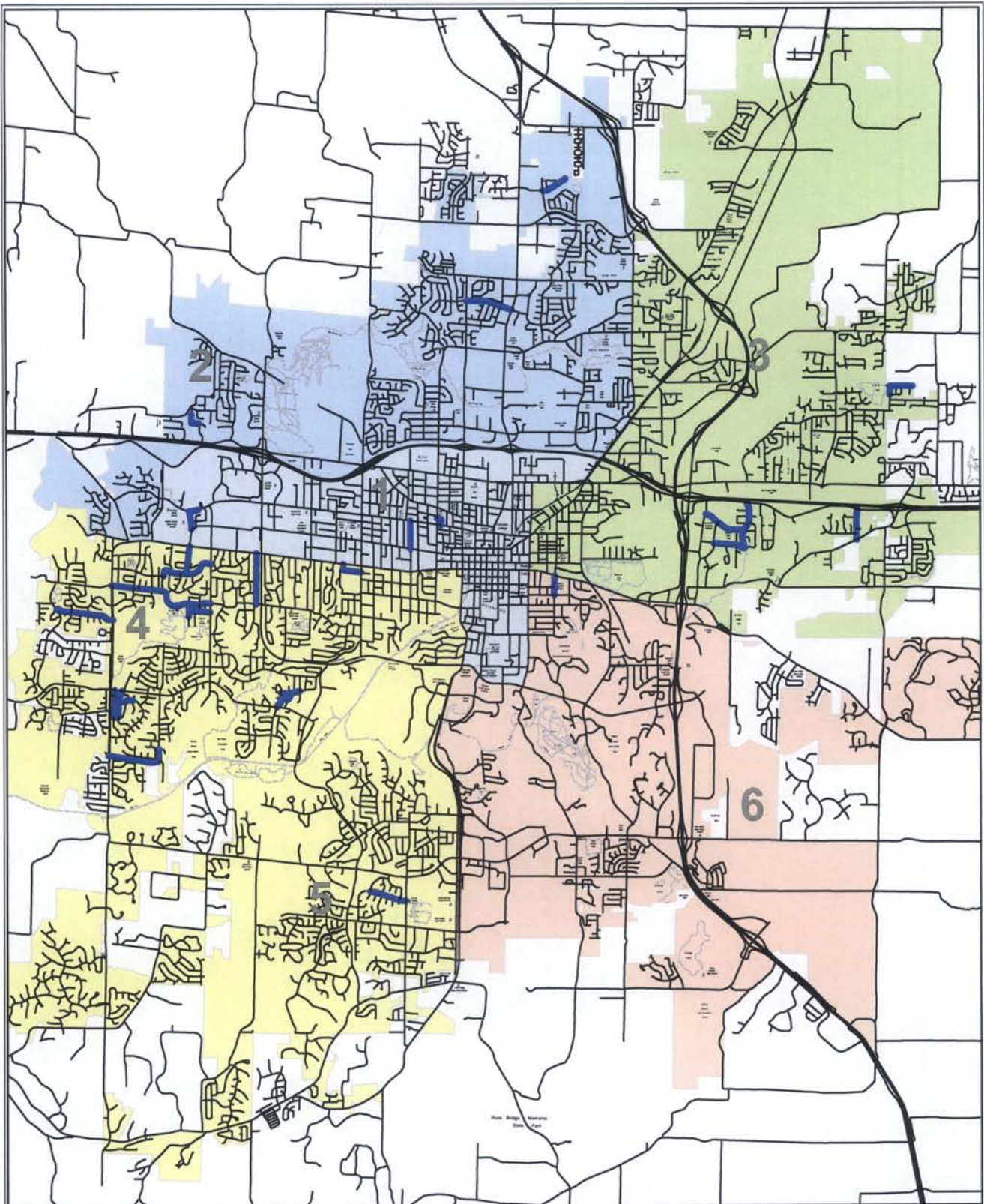
After the installation of traffic control devices, staff shall conduct follow up monitoring of traffic volumes, speed and accident occurrence at six months, one year and five years to determine the effectiveness of the project.

5. Funding For Installation of Traffic Calming Practices

1. Traffic calming devices may be installed at the City's expense subject to availability of funds when the study clearly indicates a traffic problem does exist on the basis of excessive speeds, accidents or roadway design deficiencies and when supported by a minimum of 50% of the residents in the impacted area as evidenced by signed petitions.

Traffic calming devices may be jointly inaugurated by the City subject to availability of funds and by residents of a neighborhood when a clearly identifiable traffic problem does not exist but there can be shown to be a general public benefit in the form of aesthetics or preventive safety. A petition signed by at least 65% of the residents in the impacted area will be required. The proportionate share of each party shall be based on a determination by City Council of the amount of public benefit provided by the project.

Traffic calming devices may be installed by the residents of a neighborhood at their expense when there is no clearly identified traffic problem or public benefit provided that the Director determines that the installation of the devices will not be detrimental to the general public. A petition signed by at least 75% of the residents in the impacted area will be required.



EXISTING TRAFFIC CALMING

Wards



Legend

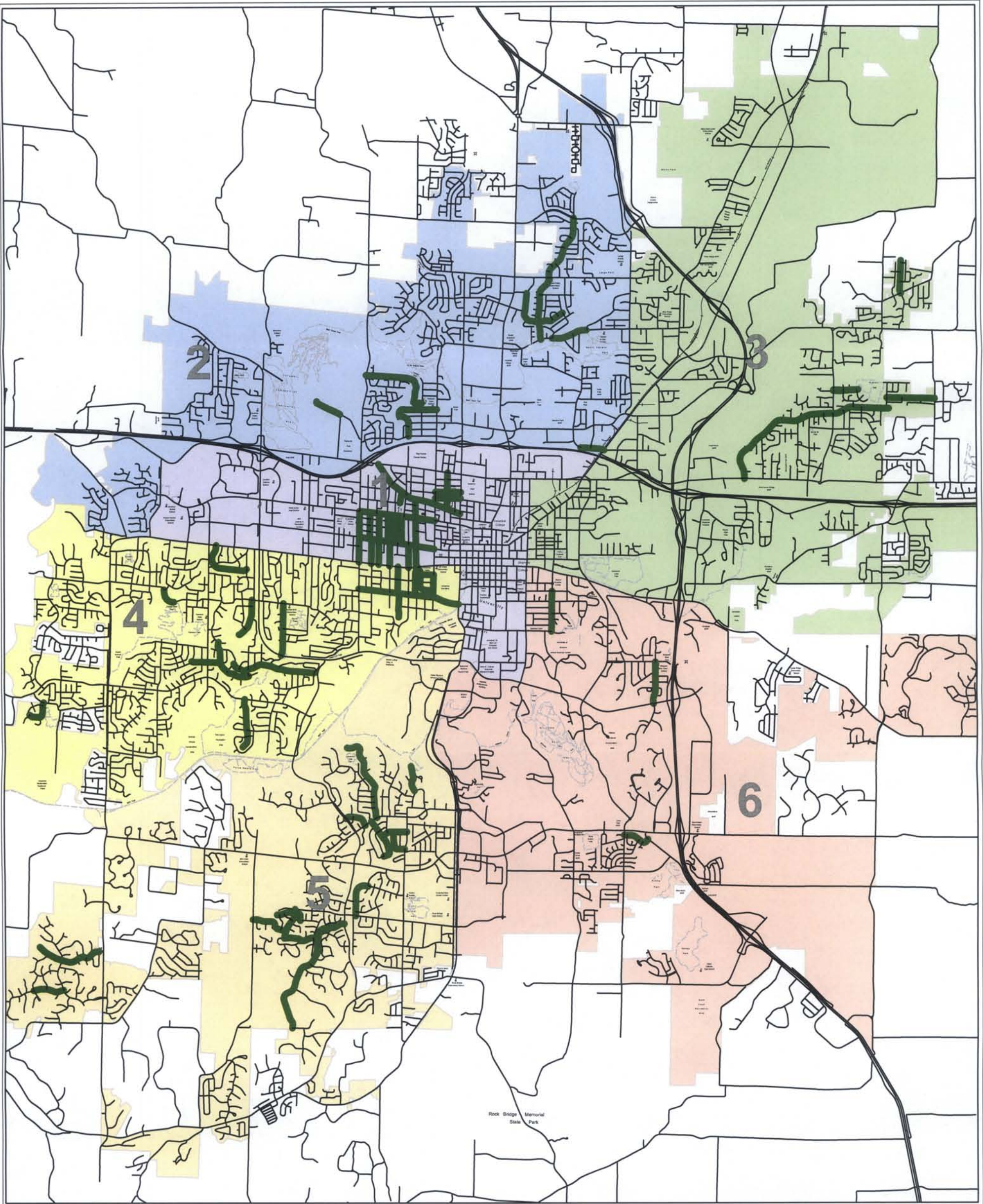


EXISTING TRAFFIC CALMING

City of Columbia, Missouri

Scale 1" = 5000'

October 18, 2013



TRAFFIC CALMING PROJECT

Wards

1	3	5
2	4	6

Legend

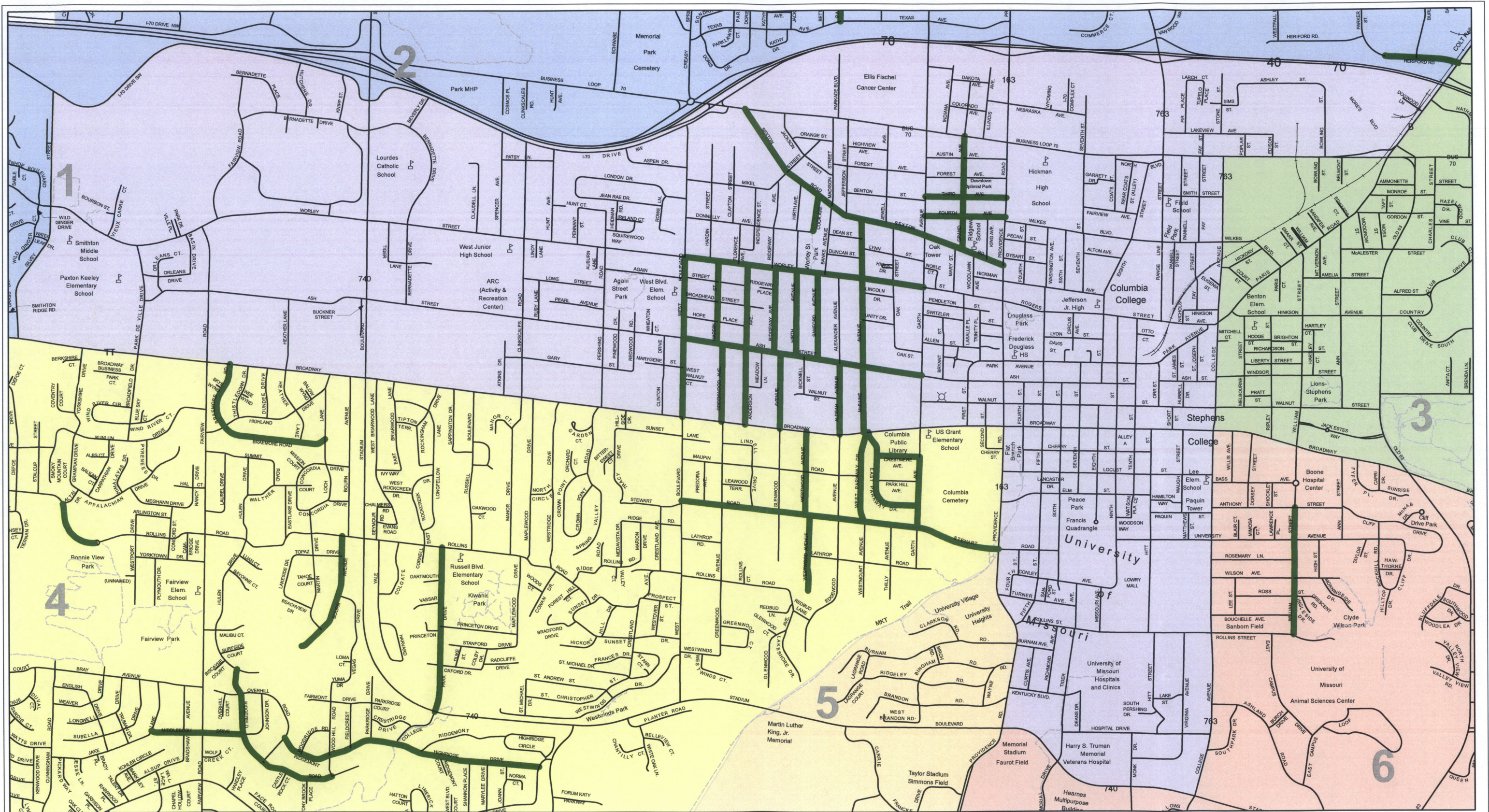
—	Township/Range Line	—	Private Drive/Street
—	Section Line	—	Trail
—	Quartersection Line	—	Railroad Tracks
—	Creek/Stream	—	School
—	Corporate Limit Line	—	Water Tower



TRAFFIC CALMING PROJECTS
City of Columbia, Missouri

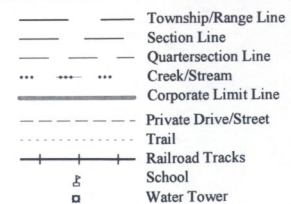
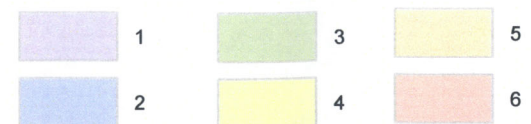
Scale 1" = 5000'

October 21, 2013



 TRAFFIC CALMING PROJECT

Wards

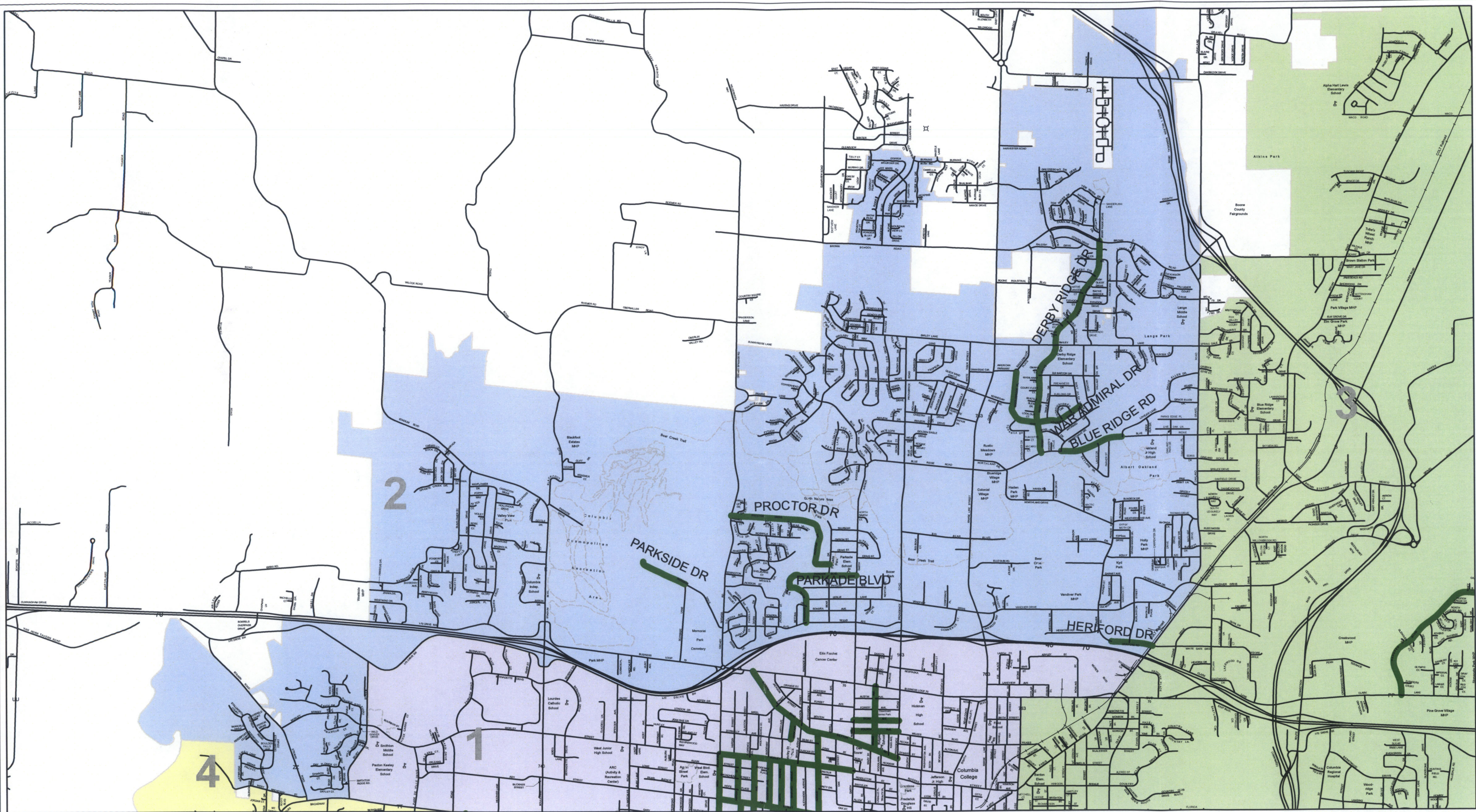


TRAFFIC CALMING PROJECTS - WARD 1

City of Columbia, Missouri

Scale 1"=1500'
October 18, 2013





TRAFFIC CALMING PROJECT

Wards

1	2	3	4	5	6
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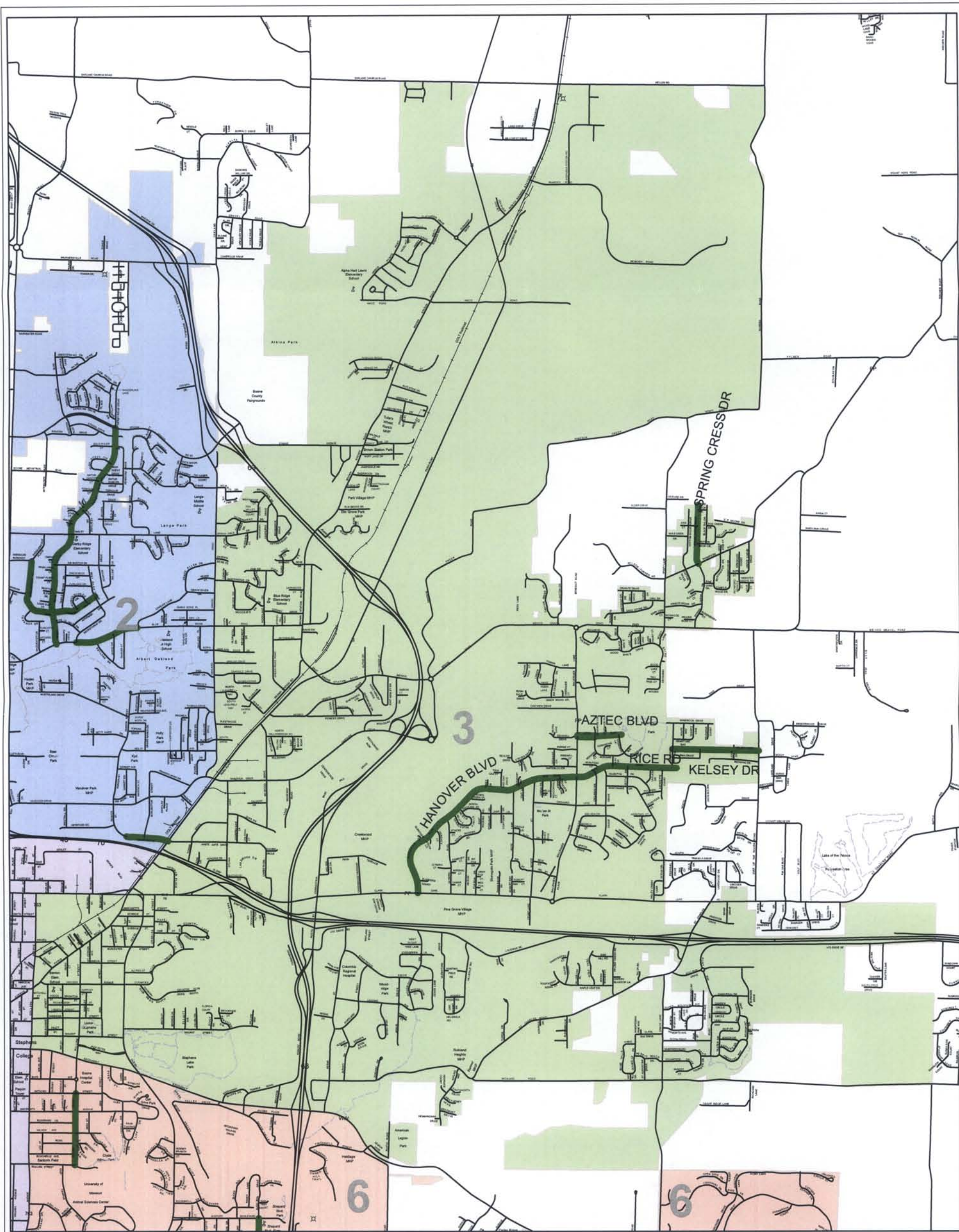
- Township/Range Line
- Section Line
- Quartersection Line
- Creek/Stream
- Corporate Limit Line
- Private Drive/Street
- Trail
- Railroad Tracks
- School
- Water Tower

TRAFFIC CALMING PROJECTS - WARD 2

City of Columbia, Missouri

Scale 1"=2700'
October 21, 2013





TRAFFIC CALMING PROJECT

Wards

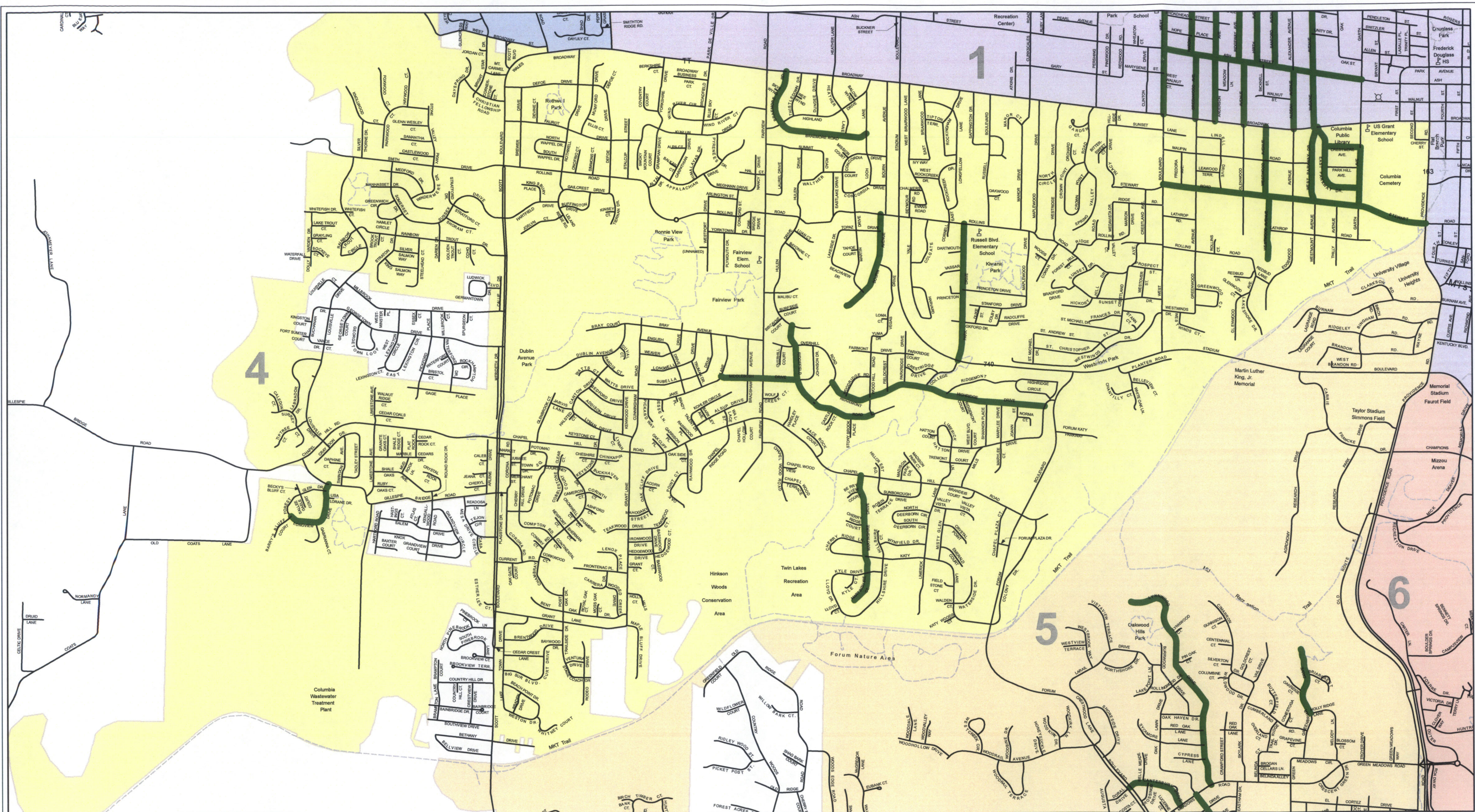
1	3	5
2	4	6

- Township/Range Line
- Section Line
- Quartersection Line
- Creek/Stream
- Corporate Limit Line
- Private Drive/Street
- Trail
- Railroad Tracks
- School
- Water Tower

Scale 1"=2700'
October 18, 2013

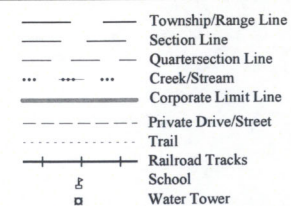


TRAFFIC CALMING PROJECTS - WARD 3
City of Columbia, Missouri



 **TRAFFIC CALMING PROJECT**

Wards

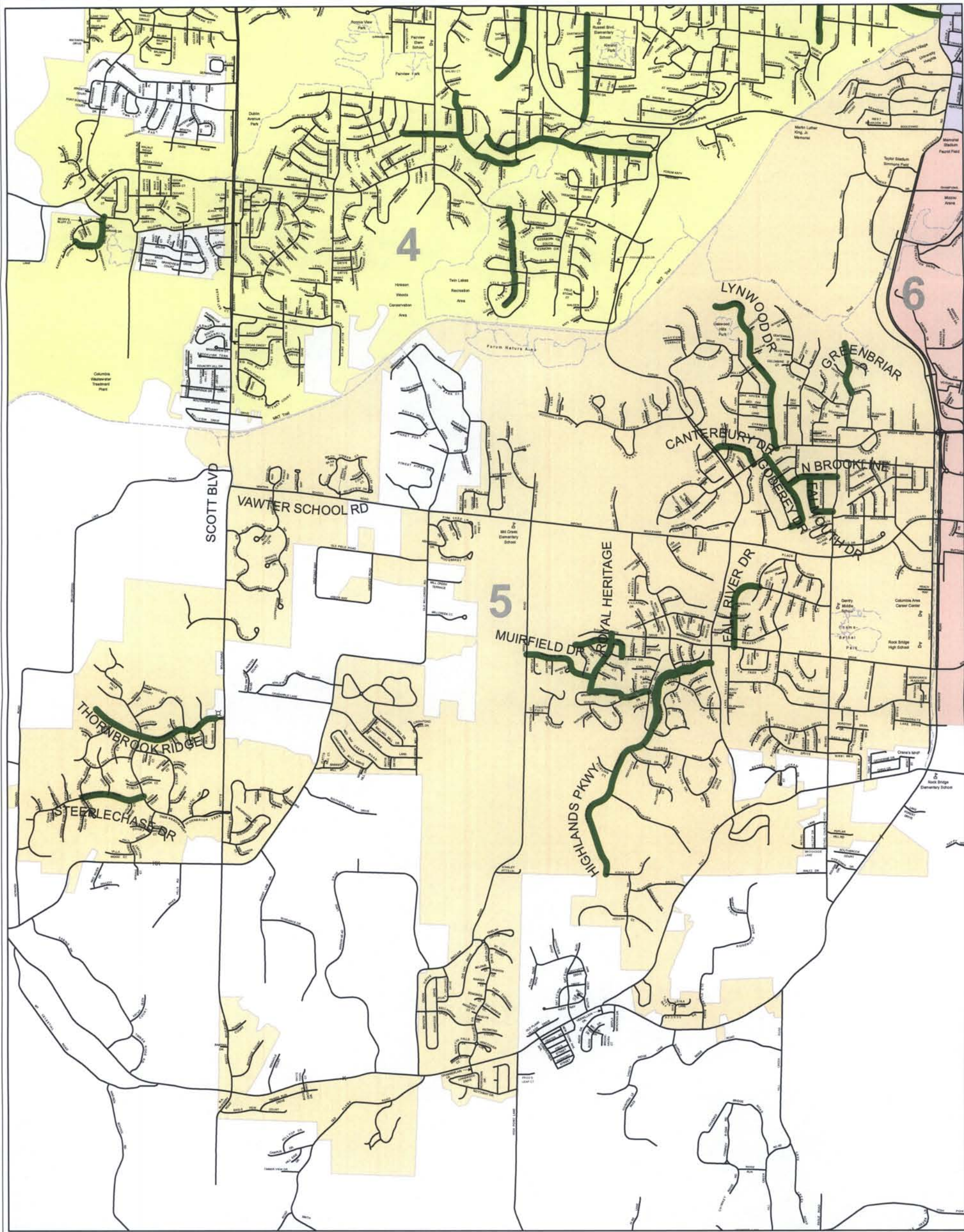


TRAFFIC CALMING PROJECTS - WARD 4

City of Columbia, Missouri






Scale 1"=1800'
October 18, 2013







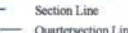
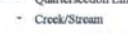






 **TRAFFIC CALMING PROJECT**

Wards

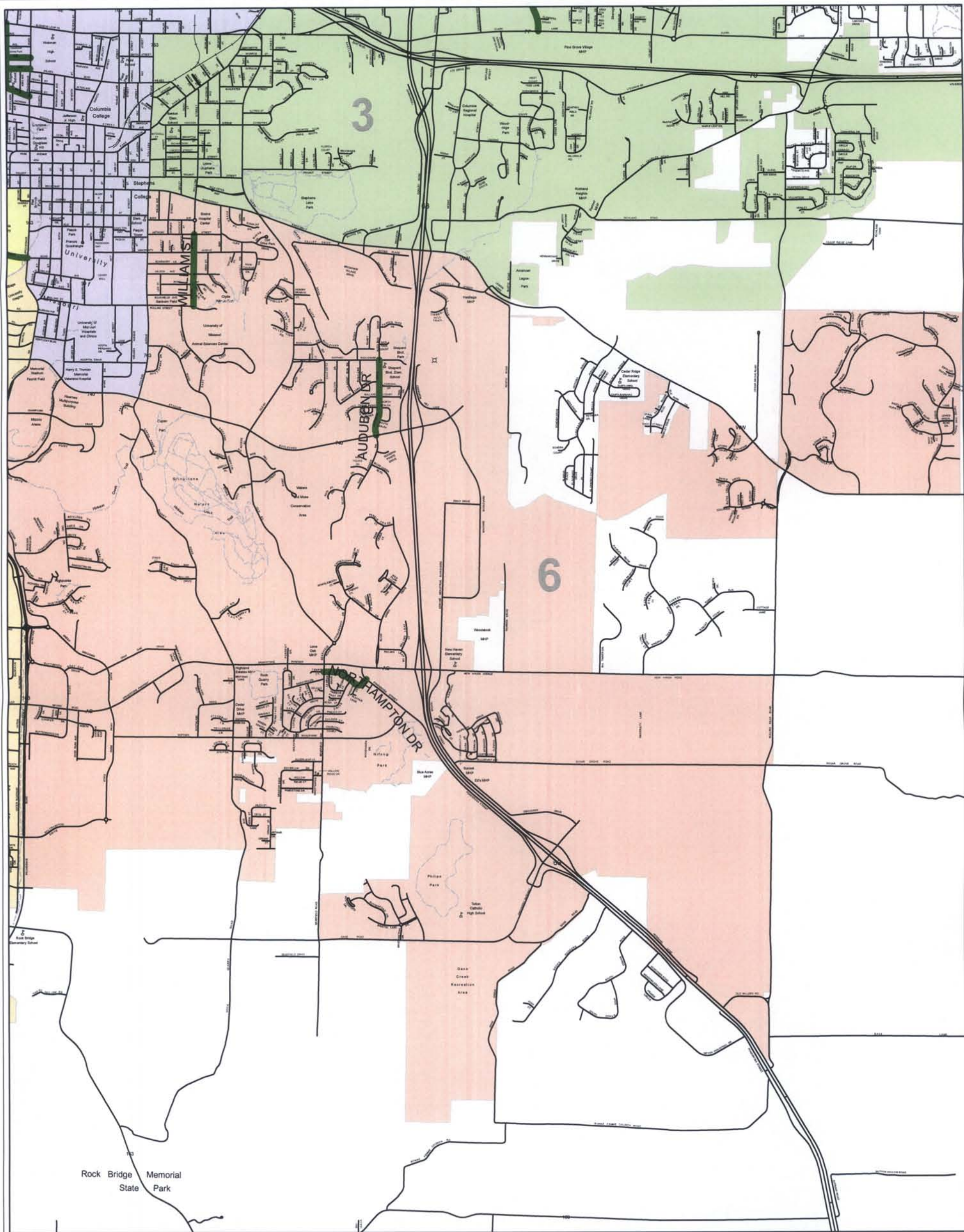
	1		3		5
	2		4		6

-  Township/Range Line
-  Section Line
-  Quartersection Line
-  Creek/Stream
-  Corporate Limit Line
-  Private Drive/Street
-  Trail
-  Railroad Tracks
-  School
-  Water Tower

Scale 1"=2400'
October 18, 2013

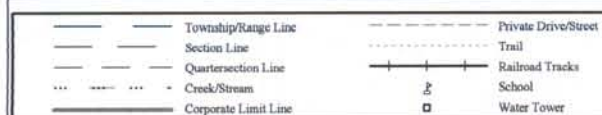


TRAFFIC CALMING PROJECTS - WARD 5
City of Columbia, Missouri



 TRAFFIC CALMING PROJECT

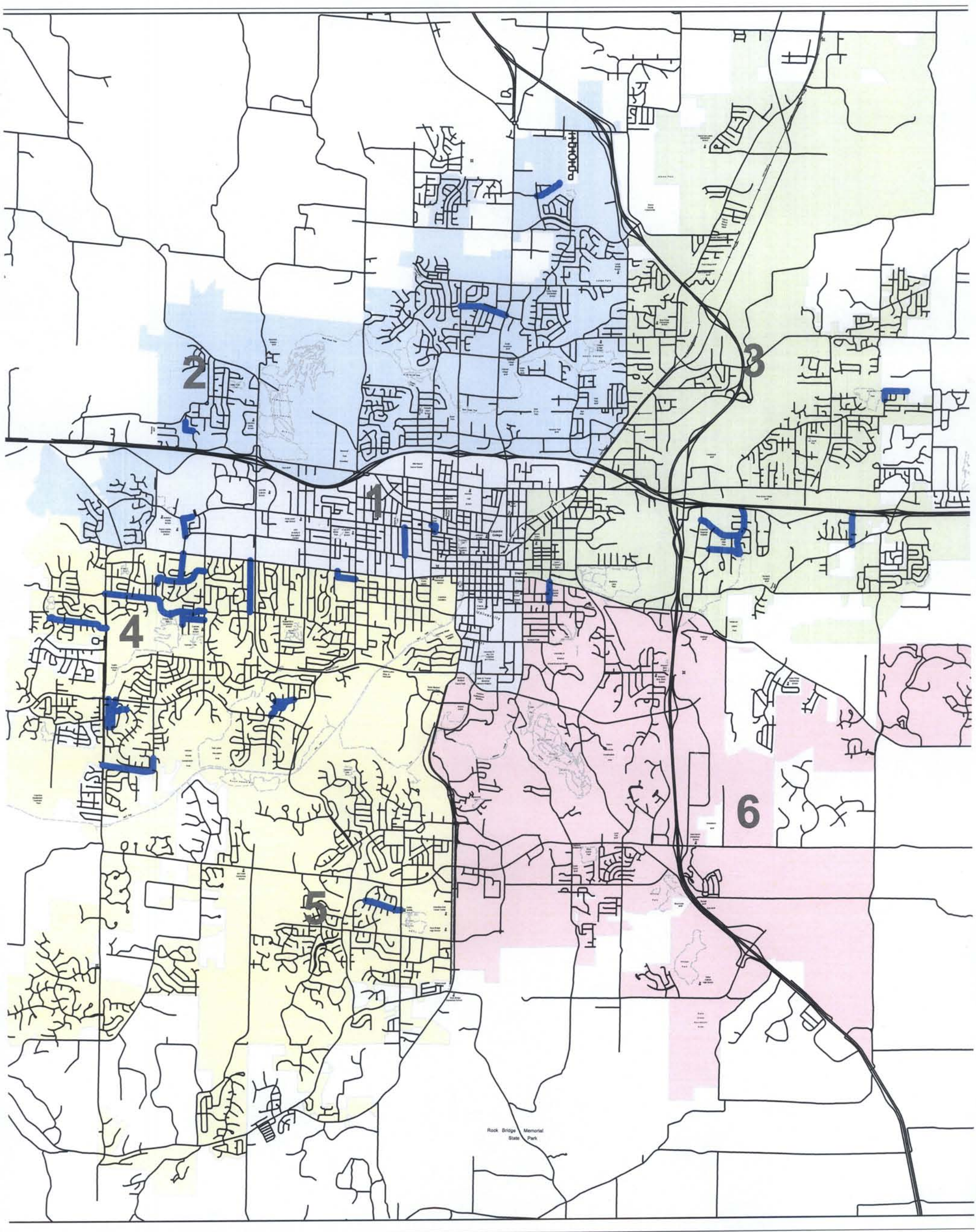
Wards



Scale 1"=2700'
October 18, 2013













TRAFFIC CALMING PROJECTS - WARD 6
City of Columbia, Missouri



 EXISTING TRAFFIC CALMING

Wards



- Legend
- | | | | |
|--|----------------------|---|----------------------|
|  | Township/Range Line |  | Private Drive/Street |
|  | Section Line |  | Trail |
|  | Quartersection Line |  | Railroad Tracks |
|  | Creek/Stream |  | School |
|  | Corporate Limit Line |  | Water Tower |

EXISTING TRAFFIC CALMING

City of Columbia, Missouri

Scale 1" = 5000'

October 18, 2013