Appendix B – Traffic Calming Policy

This appendix includes the full text of the Town of Hillsborough Traffic Calming Policy, which was previously adopted as a standalone document.

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TOWN OF HILLSBOROUGH
RESIDENTIALTRAFFIC CALMING POLICY

Policy Statement

The Town of Hillsborough wishes to have a procedure whereby its' residents can petition the Town to incorporate traffic calming devices and systems in order to alleviate speeding, excessive traffic volume, dangerous intersections or other conditions that are of a public safety nature.

The purpose of this document is to present ways in which residents can find solutions to residential traffic problems as approved by the Hillsborough Town Board. Consideration is given to a variety of residential traffic concerns and to the characteristics of these concerns on a case-by-case basis. Each situation is reviewed with respect to the available traffic control measures that have been, or could be, found effective in alleviating the neighborhood traffic concern.

The following outlines these guidelines and procedures which can be used to develop the optimum solution or solutions to each particular situation. There are many factors taken into consideration when reviewing residential traffic concerns to determine the most feasible traffic control measure. These factors include the surrounding roadway network, resident access, speeds and/or volume of traffic, accident history, neighborhood response and budget considerations.

Note: Public health and safety concerns are always the overriding consideration when installing or removing traffic control devices.

Evaluation Criteria for Streets

1. The street must be classified as a two-lane residential street.
2. The street must be a municipality maintained roadway that receives Powell Bill funding. State roadways are excluded under this policy.
3. The posted speed limit on the affected length of the street must be 25 miles per hour which is the standard speed limit for residential streets.
4. Vehicle speeds (for at least 85% of the vehicles, established by radar or equivalent method) must exceed 35 MPH (+ 10 MPH over posted speed limit).
5. Actual traffic volume will be based on traffic counts conducted by the Town of Hillsborough Public Works staff or its designee. Guidelines reviewed by staff as received from the Institute of Transportation Engineers (ITE) that is appropriate for town streets.
6. A positive recommendation for installation must be received from Police, Fire, and EMS.

Petition Requirements

1. Those parties requesting the installation of a Traffic Calming Device must demonstrate sufficient support for the installation of the device in the affected area; support shall be shown by signatures obtained on the standard Petition for Traffic Control Devices provided by the Town.

2. Only one signature per household can be obtained.
3. Signatures must be of the current residents within the defined study area.
4. Residents must provide their address in the space allotted.
5. Signatures will be checked by Town Hall staff using property tax records.
6. Signatures that do not adhere to these requirements will be considered invalid.
7. The number of valid signatures either for or against installation must meet or exceed 65% of the total number of residents of the impacted area.

Procedure for Obtaining Approval

1. The process is initiated when the Public Works Director receives a request for installation of a traffic control device. A preliminary investigation into the first five qualifying criteria will be completed. If these criteria are met, the Public Works Director or his designee will conduct a field investigation of the impacted area. A petition package containing the Town of Hillsborough Traffic Calming Policy and a Petition Form will be mailed to the requesting party.
2. The requesting party is responsible for obtaining signatures on the petition form and returning it to Town Hall. If the number of valid signatures equals or exceeds 65% of the total number of residents of the impacted area; Police, Fire, and EMS will be contacted for recommendations.
3. Traffic monitoring devices will be used to determine average daily traffic, vehicle speeds, and vehicle types.
4. When all qualifying criteria are met, a report will be prepared for the Board of Commissioners outlining all relevant information and any extenuating circumstances concerning the characteristics of a requested street.
5. The Board of Commissioners will approve or disapprove installations for the requested street based on the "finding of fact" report provided by the Public Works Director.

Funding

The Town of Hillsborough has not identified any special funding source for traffic calming projects. Nor has the Town set-aside any existing funds to be used exclusively on traffic calming projects. Funding options available are special assessments, operating funds, and private funding. The Town of Hillsborough Board of Commissioners will determine the appropriate funding mechanism for the installation of traffic calming devices on a case by case basis.

Special Assessments:

Installation of traffic calming devices is considered a street improvement and are eligible for special assessments in accordance with North Carolina General Statute § 160A-216 (1).

Powell Bill (Operating Budget):

The Town of Hillsborough will cover the cost of activities associated with the development, construction, and installation of traffic calming devices dependent upon the availability of funding.

Private Funding:

Residents of an existing neighborhood wishing to accelerate the process may choose to fund all or part of the development, construction, and installation of their requested traffic calming device.

Powell Bill (Operating Budget)/Private Funding:

The Town of Hillsborough and residents of an existing neighborhood will share the cost of activities associated with the development, construction, and installation of traffic calming devices. The Town's participation in any cost sharing venture is dependent on the availability of funding.

Traffic Calming Measures

Generally, traffic calming measure fall into 4 types: non-physical, vertical, horizontal, and diversion. Non-physical options generally don't directly impact the street design, but can influence driver behavior. Vertical measures change the vertical smoothness of the driving surface to impact driver behavior. Horizontal measures impact the straightness of the driving path to impact driver behavior. Diversion measures change the available road network to re-route drivers.

Non-Physical Traffic Calming Measures

1. **Speed Enforcement**- Temporary targeted speed limit enforcement in areas where residents are concerned.
2. **Radar Trailers** - A radar trailer can be placed adjacent to a roadway to measure and display a passing vehicles speed. Providing the posted speed limit on the device reminds drivers to slow down if they are traveling too fast.
3. **Lane Striping** - Lane striping can be used to visually narrow travel lanes in a given area. By using highly visible stripes, vehicles are encouraged to slow down.
4. **Signage**- Placing appropriate warning and information signs and additional regulatory signs reminds motorists of the various roadway conditions and hazards of the area.
5. **Pavement Marking Legends**- The speed limit or other driver information can be painted onto the street to remind drivers of the speed limit or other area conditions that warrant special attention.
6. **High Visibility Crosswalk**- High intensity paint or plastic can be used in a dense pattern to clearly delineate a cross walk. Crosswalk should be accompanied by appropriate signage.
7. **On-Street Parking**- Designates area along a street to store vehicles. On-street parking may be used along one or both sides of the street. May also be a revenue generator through permit, meter, or other methods.
8. **Raised Pavement Markers**- Raised pavement markers are plastic reflectors installed in the pavement that, when installed in series, alert the driver when they are deviating from the travel lane. They can be installed on the centerline and edge line of a roadway or across a roadway to function as a rumble strip. They are often used on curves.
9. **Streetscaping** - Streetscaping can incorporate many different ideas and approaches. Typically, Streetscaping includes planting street trees and other landscaping along the roadway. Streetscaping also usually involves establishing a planting area between the street and the sidewalk.
10. **Multi-Way Stops**- Multi-way stops involve placing stop signs on all approaches to an intersection. Considerations for Multi-way stops should follow guidelines as described in the Manual on Uniform Traffic Control Devices (MUTCD).

11. **Turn Prohibitions and Other Restrictions** - Turn prohibition signs are posted to restrict movement through a given area and to limit travel in certain directions. Other restrictions, such as "No Trucks", can also help reduce cut-through traffic. Speed limit reductions can be used in areas where existing speed limits are higher than desired; however, speed limit changes alone are generally not effective in significantly reducing travel speeds on local residential streets.
12. **Gateways/Entryways** - Gateways include decorative signing and/or landscaping to visually identify the entrance to a neighborhood or commercial district. This measure helps to make the area appear as a destination rather than a connection to another area. Gateways are often incorporated into a median island.
13. **Colored Pavements**- Pavement can be installed with many colors and patterns. These unique properties can slow drivers by forcing them to process different patterns as they approach an area. Colored pavement can also help delineate the separation between a travel lane and lanes that accommodate other modes of transportation.

Vertical Traffic Calming Measures

1. **Textured Pavement**- Textured pavements can alert motorists to special conditions through sound and/or vibration. Rumble strips are typical example of how textured pavement can produce a sound to warn a driver approaching a hazardous condition. Textured pavements combined with colored pavements can delineate a special area, such as a historic district. Brick pavers are a form of textured pavement.
2. **Speed Humps** - Raised hump (pavement undulation) in the roadway with a parabolic top which exceeds across the road at right angles to the direction of traffic flow. Most effective if used in a series; spaced 300'-500' apart
3. **Speed Lumps**- Speed lumps are a variation of speed humps that add two cut-outs for tires of larger vehicles. The cut-outs are designed so that wider vehicles, such as emergency vehicles, can fit through with little slowing but a standard vehicle must pass at least one side of its wheels over the hump.
4. **Speed Tables** - Speed tables are elongated speed humps with flat tops that usually allow for the entire wheel base of a standard vehicle to be on the top flat part Usually, a textured pavement or alternative design is used to distinguish the speed table from the rest of the roadway.
5. **Raised Crosswalks** - Raised crosswalks are equivalent to speed tables with crosswalk markings. Should be accompanied by appropriate signage.
6. **Raised Intersections** - Raised intersections are equivalent to speed tables, only they are applied over the entire intersection with ramps on all sides. They are normally at or near the same elevation as the sidewalk. Often include textured and/or colored pavements.

Horizontal Traffic Calming Measures

1. **Traffic Circles**- Provides circular, counter clockwise operations at intersections by placing a raised island in the middle of the intersection. Vehicles on the 'thru' street must change their travel path to maneuver around the circle. Entry into the intersection is often controlled by Yield signs on all approaches.
2. **Roundabouts** - Similar to traffic circles but larger and with "splitter" islands on each approach that flare entry into the circle.
3. They are more typically used as a substitute for a traffic signal. Traffic on the approaches must yield to vehicles within the circle.

4. **Curb Extensions -** Used to make pedestrian crossing movements shorter and easier. Used to narrow the roadway cross- section at particular points (intersection, mid-block, etc.) but still maintains separate lanes for opposing traffic flows. Often used in combination with a raised crosswalk.
5. **Chicanes-** Physical constriction built at the curbside of the roadway to create bends in a formerly straight road. Vehicles are forced to negotiate the narrowed street in a serpentine fashion. Retrofitting an existing street typically allows one lane through the chicane so that opposing traffic must alternate passage through the constraints.
6. **Lateral Shifts** - A lateral shift is a curb extension which shifts the roadway horizontally. A second shift downstream may move the roadway back to the original alignment. These are also frequently called two-lane chicanes.
7. **Neckdowns -** Neckdowns are used to make streets more pedestrian-friendly by shortening the crossing distance and reduce speed by narrowing the travel lanes.
8. **Realigned Intersections –** Realigned intersections are changes in alignment that cover T- intersections with straight approaches into curving streets that meet at right angles. A former "straight-through movement along the top of the T becomes a turning movement. This is one of the few traffic calming measures available for T-intersections.
9. **Bulb outs –** Similar to curb extensions at intersections. Used to narrow the street width to help facilitate pedestrian movements and reduce speeds on one or more approaches.
10. **Two-Lane Chokers**- Two-lane chokers are used at mid-block points to reduce the overall cross section of the street providing a natural slow down point.
11. **One-Lane Chokers** - Curb extensions toward the center of the roadway that reduce the street from two lanes to one lane. This requires vehicles to come to a stop and yield to oncoming traffic.
12. **Center Island Narrowing**- Narrowing of the roadway with a raised center island, typically planted, between the travel lanes. They also provide a pedestrian refuge thereby allowing pedestrians to cross one travel lane at a time.
13. **Medians**- Used to separate lane movements and provide a visual cue along the roadway. Medians can be especially effective along curves. Medians can also be used as a diversion device by restricting access at intersections and to adjacent properties.

Diversion Traffic Calming Measures

1. **Street Closures-** Barrier or pavement removal intended to block all vehicle access on a street. Pedestrian and bicycle access is typically maintained. Often designed to allow emergency vehicles to 'break-through' the closure. Cul-de-sacs are a common form of this measure.
2. **Diagonal Diverters** - Diagonal diverters bisect an intersection diagonally, disconnecting the legs of the intersection and creating two separate roadways. This can be accomplished with a simple barrier such as guardrail or through pavement removal and landscaping. Pedestrian and bicycle access is typically maintained. Can be designed to allow emergency vehicles to 'break-through' the barrier.
3. **Semi-diverters**- A semi-diverter is a barrier, usually a landscaped island, on one side of a street at an intersection that permits traffic on the opposite direction to pass through; thereby creating a one-way street at the intersection but maintaining two-way traffic for the rest of the block.

Comparison of Speed Control Devices			
DEVICES	ADVANTAGES	DISADVANTAGES	COSTS
Speed Enforcement	- May be implemented immediately with little planning - No impact to emergency response times - Secondary benefits include reduced crime and higher sense of security	- Expensive to maintain for an extended period of time - May only be effective for a short time - May only be effective for short distances	Varies
Radar Trailers	- In the long-term, less expensive than police enforcement - May be implemented immediately with little planning - No impact on emergency response times - Effective for reducing speeds in a short span	- Only effective for one direction of travel at a time - May only be effective for a short time - May only be effective for short distances	Varies
Lane Stripping	- Inexpensive - May be implemented quickly with little planning - No impact to emergency response times	- Increases maintenance costs	$0.15-$1.00 per lineal foot (paint) $1.00-$5.00 per lineal foot (plastic)
Signage	- Inexpensive - No impact to emergency response times	- Increases maintenance costs - Signs typically considered unsightly – most people do not want them in their yard	$50-$100 per sign
Pavement Marking Legends	- Inexpensive - May be implemented immediately with little planning - No impact to emergency vehicle response times	- Increased maintenance costs - Has not been proven to reduce speed	$25-$50 per letter or number $100-$200 per symbol
High Visibility Crosswalk	- Inexpensive - No impact to emergency vehicle response time - Helps collect and distribute pedestrians along the street - Increases visibility of pedestrians	- Requires more maintenance than normal crosswalk - May provide pedestrians with false sense of security, especially when used at mid-block location or uncontrolled	$200 per crosswalk lane

		approaches to an intersection	
On-Street Parking	- Provides more vehicle storage - Narrows street width to encourage slower vehicular travel - Shortens pedestrian crossing distance - Encourages pedestrian activity in an area	- May be ineffective if parking is not adequately utilized - May reduce sigh distance for both drivers and pedestrians - May increase certain types of vehicular crashes - May restrict bicycle movements - Traffic volumes may increase especially in areas of high demand an low availability of off-street parking - May impede emergency response vehicles and solid waste collection	Dependent on frequency of spaces, enforcement costs, etc.
Raised Pavement Markers	- Inexpensive - May be implemented immediately with little planning - No impact to emergency vehicle response times - Secondary benefits include increased delineation and roadway safety	- Noise - May be unintentionally removed during snow removal - Increased maintenance costs	$2-$7 per marker
Streetscaping	- May reduce speed and volumes - Positive aesthetic effects - Good functionality - Increases pedestrian safety - Improves quality of life for neighborhood - No impact to emergency response times	- Can create vehicular hazards - Can create poor visibility conditions if installed too dense - Possibly increased maintenance costs	Varies depending upon materials, length, and width of application area, and availability of right-of-way
Multi-Way Stops	- If traffic signals are warranted, can be used as temporary measure - Can reduce intersection collisions - Little impact to emergency response times - May be implemented quickly with little planning - May provide a safer crossing for pedestrians	- Speeds between intersections often decrease - Increases noise and air pollution - Can cause read-end accidents - Requires enforcement - If stop signs are warranted, disregard for	$300-$600 per intersection

		measure can create dangerous situations	
Turn Prohibitions and Other Restrictions	- Inexpensive to install - No impact to emergency response time - May increase pedestrian traffic - Transit and school buses can be exempted - Restrictions can be "part-time"	- Deliberate violation could create a hazard - May divert problem onto another street - Requires enforcement - Requires approval of an enabling ordinance - Not effective for reducing speeds	$100-$200 enforcement costs
Gateways/Entryways	- May reduce volumes - Positive aesthetic effects - Good functionality - Improves quality of life for neighborhood - No impact to emergency response times	- Can increase vehicular hazards - Can create poor visibility conditions - Can be expensive	Varies depending on materials, length, and width of application area
Colored Pavements	- May reduce speeds and volumes - Positive aesthetic effect - Good functionality - Increases pedestrian safety - Improves quality of life for neighborhood - No impact to emergency response times	- Can create vehicular hazards - Can make roadway features difficult to see if installed too densely - Increased maintenance - Surface can be slick – hazardous to pedestrians and cyclists	Varies depending on materials, length, and width of application area
Textured Pavement	- May reduce vehicle speeds - May add aesthetic value - If used at an intersection can calm two streets at once - Little or no impact to emergency response times	- Textured materials are expensive - Increased noise - Difficult for physically challenged individuals to maneuver - Increased maintenance costs	Varies with material and area of installation
Speed Humps	- Effective in reducing speed - Compatible with pedestrians and bicycle movement - May also decrease cut-through traffic by increasing travel time - Inexpensive	- Increased noise when vehicles travel over them - Increased maintenance costs - Slows emergency vehicles and buses - Aesthetics - Can be very uncomfortable to vehicle occupants with certain disabilities	$1,500-$2,000
Speed Lumps	- Effective in reducing speeds - Maintains rapid response time - Inexpensive	- Aesthetics - Private vehicles with large wheel bases can avoid the humps	$1,800-$2,000

	- Relatively easy for bicyclists to cross if installed correctly	- Increased noise - Increased maintenance costs - Can be very uncomfortable to vehicle occupants with certain disabilities	
Speed Tables	- Smoother than humps for larger vehicles - Effective in reducing speeds - Compatible with pedestrian and bicycle movements - May also decrease cut-through traffic by increasing travel time	- Aesthetics, if decorative surface material is not used - Decorative materials are expensive - Increased noise - Increased maintenance costs - Slows emergency vehicles and buses - Can be very uncomfortable to vehicle occupants with certain disabilities	$1,500-$4,000 (depending on materials
Raised Crosswalks	- Smoother than humps for larger vehicles - Effective in reducing speeds - Increases visibility for pedestrians - Slows vehicular traffic at conflict point with pedestrians - Better than simple crosswalk for visually impaired pedestrians - May also decrease cut-through traffic by increasing travel time	- Aesthetic, if decorative surface material is not used - Decorative materials are expensive - Increased noise - Increased maintenance costs - Slows emergency vehicles and buses - Can be very uncomfortable to vehicle occupants with certain disabilities	$1,800-$4,000 (depending on materials
Raised Intersections	- Smoother than humps for larger vehicles - Effective in reducing speeds - Increases visibility for pedestrians - Slows vehicular traffic at conflict point with pedestrians - May also decrease cut-through traffic by increasing travel time	- Aesthetics, if decorative surface material is not used - Decorative materials are expensive - Increased noise - Increased maintenance costs - Slows emergency vehicles and buses - Can be very uncomfortable to vehicle occupants with certain disabilities	Varies by materials used and intersection size

Traffic Circles	- May significantly reduce speeds on "thru" streets - Reduces intersection collisions - Provides additional street aesthetics - May be used as a volume control device without limiting access	- May require removal of parking near intersection - May cause sight distance problems for vehicles - Depending on size and location, may have high installation costs - May impact emergency response times - May impede large vehicles	$5,000-$10,000
Roundabouts	- Reduces vehicles speeds - Eliminates typical left-turn conflicts - In the long run, more economical to maintain than traffic signal - Adds to street aesthetics - Reduces crash severity at intersections	- Often requires a large amount of right of way - May require additional lighting to lessen driver confusion at night - Not a typical traffic calming measure for local streets (used for collections and minor thoroughfares) - Initial costs are high	Single lane roundabout $20,000-$120,000 (depending on Right-of-Way requirements)
Curb Extensions	- Narrows street width to encourage slower vehicle traffic at specific points - Shortens pedestrian crossing distance and makes pedestrians more visible - May facilitate more on-street parking spaces - Intended to reduce vehicle speeds	- Conflicts with flow of bicycle lanes - Requires removal of some on-street parking	$7,000-$10,000
Chicanes	- Typically results in lower speeds - One lane chicanes can significantly reduce cut-through traffic - Can be aesthetically pleasing	- May lead to an increase in head-on collisions - Higher maintenance costs - Can severely impact emergency response vehicles - Should not always be used in areas with frequent driveways - Loss of on street parking	$4,000-$8,000 (depends on length of road affected)
Lateral Shifts	- Is an effective tool for slowing traffic on high volume streets - Easy functionality for large vehicles	- Les effective for reducing speeds than a one lane chicane - Proper design is crucial to avoid lane changing by vehicles - Loss of on street parking	Varies by length, width, and shift distance

		- May require additional right-of-way	
Neckdowns	- Increased pedestrian safety and range - Reduces speeds	- May require bicyclists to merge with traffic - May slow emergency vehicles - Loss of on-street parking	$4,000-$5,000
Realigned Intersections	- Reduces speeds at T-intersections - Can reduce cut-through traffic by reassigning right of way at intersection	- Typically requires additional right of way on one corner - Construction can be costly - May have minor impacts on emergency response times	Varies with magnitude of the project
Bulb outs	- Reduces vehicle speeds near intersection - Makes pedestrian crossing safer and easier - Improve sight line between vehicles and pedestrians - May accommodate pedestrians with disabilities - May facilitate more on-street parking	- Does not accommodate bicycle paths - May affect turning movements (especially for large trucks)	$4,000-$5,000 per corner
Tow-Lane Chokers	- May reduce speeds - May reduce volumes - Positive aesthetic effect - Good functionality - Provides safer pedestrian crossings - May encourage more use of on-street parking - No impact on emergency response times	- No vertical and little or no horizontal deflection - Loss of on-street parking - Bicyclists may have to merge with traffic	$7,000-$10,000
One-Lane Chokers	- Reduces speed and volumes - Positive aesthetic effect - Good functionality - Safer pedestrian crossings	- Loss of on-street parking - Bicyclists may have to merge with traffic - Opposing vehicles trying to use same space - Can significantly delay emergency vehicles	$7,000-$10,000
Center Island Narrowing	- May reduce speeds and volumes - Positive aesthetic effect - Good functionality - Increases pedestrian safety	- Loss of on-street parking - Can impact emergency response vehicles if lanes are made too narrow - Should not be used in areas with frequent driveways	Varies depending on size and material

Medians	- Prevents passing maneuvers along roadway - Provide area for street landscaping - Reduces vehicle speeds along a curve - Provides pedestrians refuge area and aids crossing maneuvers - Can be used to restrict movements at intersections	- May require parking removal - May be costly - May limit access depending on length of median section - May reduce sight distance depending on roadway alignment, size of median - May impact emergency response times	Varies depending on size and material
Street Closures	- Eliminates through traffic - Reduces speeds - Improves safety for all modes of transportation	- Limits access - Creates problems for emergency vehicles - Often need to construct turn-arounds or cul-de-sacs near the closure point	$20,000 (dependent on size)
Diagonal Diverters	- Reduces speeds and volumes - Can be aesthetic enhancement - Good functionality - Increases pedestrian safety - Improves quality of life for neighborhood	- Can create vehicular hazards - Can create poor visibility conditions - Can be expensive - Potentially severe impacts on emergency response times	Varies depending on size and materials
Semi-Diverters	- Reduces volumes - Positive aesthetic effect - Increases pedestrian safety - Improves quality of life for neighborhood - Limits cut-through traffic	- Can create vehicular hazards - Restricts access at all times – not just during peak periods - Can create poor visibility conditions - Can be expensive - Does not control speed - May impact emergency vehicle response times	Varies with application size

PETITION FOR TRAFFIC CONTROL DEVICES

We, the undersigned residents, hereby petition the Board of Commissioners to approve the traffic control devices described below upon indicated street or part thereof.

THE STREET OR PART THEREOF DESIRED TO BE AMENDED IS:

THAT PART OF _____STREET

FROM _____STREET TO _____STREET.

WITH RESPECT TO THE TRAFFIC CONTROL DEVICE PETITIONED FOR, WE REQUEST:

1) _____

2) _____

3) _____

[Please note: a maximum of three (3) traffic calming devices may be requested]

Resident's signatures	Street address (mailing if different)

*The addresses of properties that will be directly affected by the proposed change have been determined by the Hillsborough Planning Department. By policy, the Board of Commissioners has stated that it would prefer to entertain request for changes in street regulations proposed by citizens only where 75% of the occupants of the properties directly affected by the proposed change have signed a petition requesting the changes.