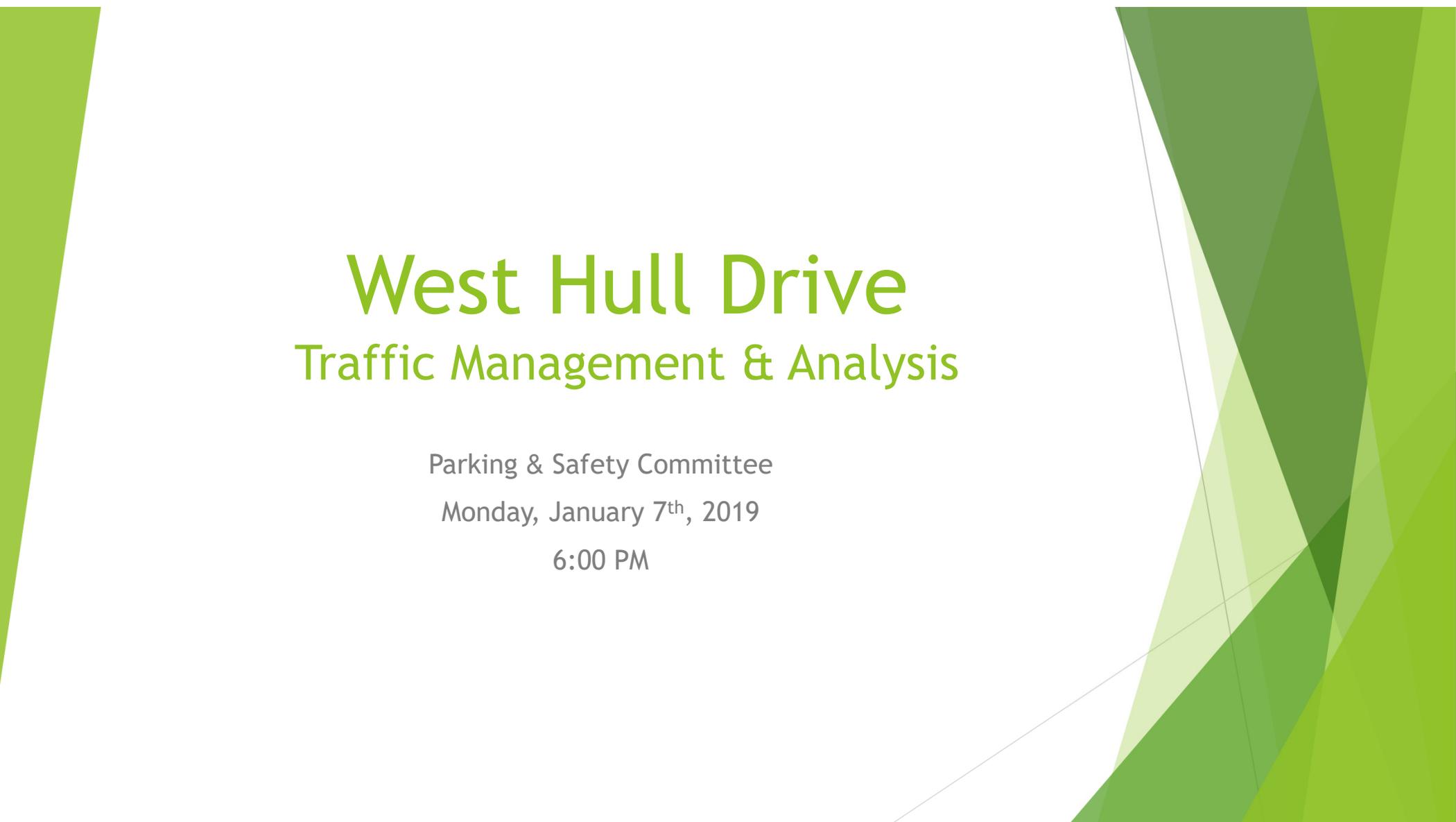


**CITY OF DELAWARE
PARKING AND SAFETY COMMITTEE
CITY COUNCIL CHAMBERS
CITY HALL
1 S. SANDUSKY STREET
SPECIAL MEETING 6:00 P.M.**

AGENDA

January 7, 2019

1. ROLL CALL
2. REVIEW
 - A. W Hull Traffic Counts
 - B. W Hull Vehicle Speeding
3. REVIEW PILOT STUDY OF NORTH PLAZA EXIT ACCESS RESTRICTIONS
 - A. Alternate 'A' Arrangement
 - B. Alternate 'B' Arrangement
 - C. Pros/Cons
 - D. Implementation Schedule
 - E. Review of Public Feedback
4. DISCUSSION OF ALTERNATIVE TRAFFIC CALMING PILOT INITIATIVE
 - A. Proposed arrangement/calming elements
 - B. Narrowing pros/cons/cost
 - C. Temporary Speed Bumps pros/cons/costs
 - D. Speed Feedback Signs – pros/cons/costs
 - E. Emergency Service Impacts/Mitigation
 - F. Cost
5. PUBLIC COMMENTS
6. FORMAL RECOMMENDATION BY COMMITTEE
7. STAFF COMMENTS
8. COMMITTEE COMMENTS
9. ADJOURNMENT



West Hull Drive

Traffic Management & Analysis

Parking & Safety Committee

Monday, January 7th, 2019

6:00 PM

Existing Traffic Counts

24 Hour Combined at Liberty Entrance

▶ Hawthorne Blvd	1289 ADT
▶ Beech Drive	600 ADT
▶ West Hull Drive	2981 ADT
▶ Somerset Road	1503 ADT
▶ Belle Avenue	1565 ADT

Delaware Community Plaza Traffic Exiting North Access Point to Hull Drive

▶ Tuesday September 11, 2018 (10:30 am-1:15 pm and 4:00 pm-6:45 pm)

▶ Left Turns Exiting Plaza	504	79% to westbound
▶ Right Turns Exiting Plaza	137	
▶ Right Turns Entering Plaza from W. Hull	483	47% from westbound
▶ Left Turns Entering Plaza from W Hull	548	

▶ Wednesday September 12, 2018 (10:30 am-1:15 pm and 4:00 pm-6:45 pm)

▶ Left Turns Exiting Plaza	500	82% to westbound
▶ Right Turns Exiting Plaza	113	
▶ Right Turns Entering Plaza from W. Hull	492	47% from westbound
▶ Left Turns Entering Plaza from W. Hull	549	

Delaware Community Plaza Traffic

Entering/Exiting North Access Point to Hull Drive

▶ 24 Hour Traffic at North Plaza Access September 4, 2018

- ▶ Enter 2390 x 47% = 1123 VPD from the west
- ▶ Exit 1808 x 80% = 1446 VPD to the west

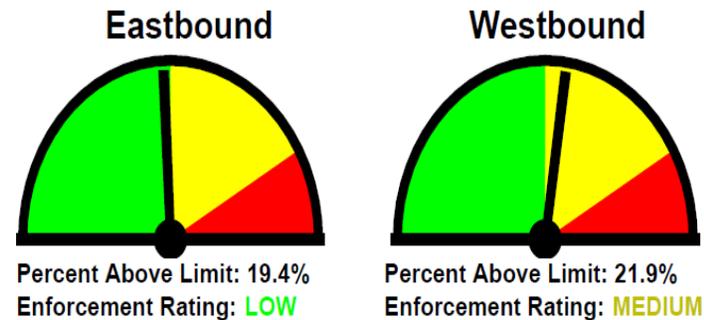
▶ 2569 vehicles of 2981 ADT to/from Delaware Community Plaza (86%)

▶ 24 Hour Traffic at North Plaza Access September 5, 2018

- ▶ Enter 2320 x 47% = 1090 VPD from the west
- ▶ Exit 1752 x 80% = 1402 VPD to the west

▶ 2492 Vehicles of 2981 ADT to/from Delaware Community Plaza (84%)

West Hull Drive Vehicle Speed Analysis



Combined

1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	>65
0	3	33	186	1659	3299	1211	132	15	2	0	0	0	0

85 percentile = 30

Eastbound

1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	>65
0	1	9	63	821	1498	508	62	6	1	0	0	0	0

85 percentile = 30

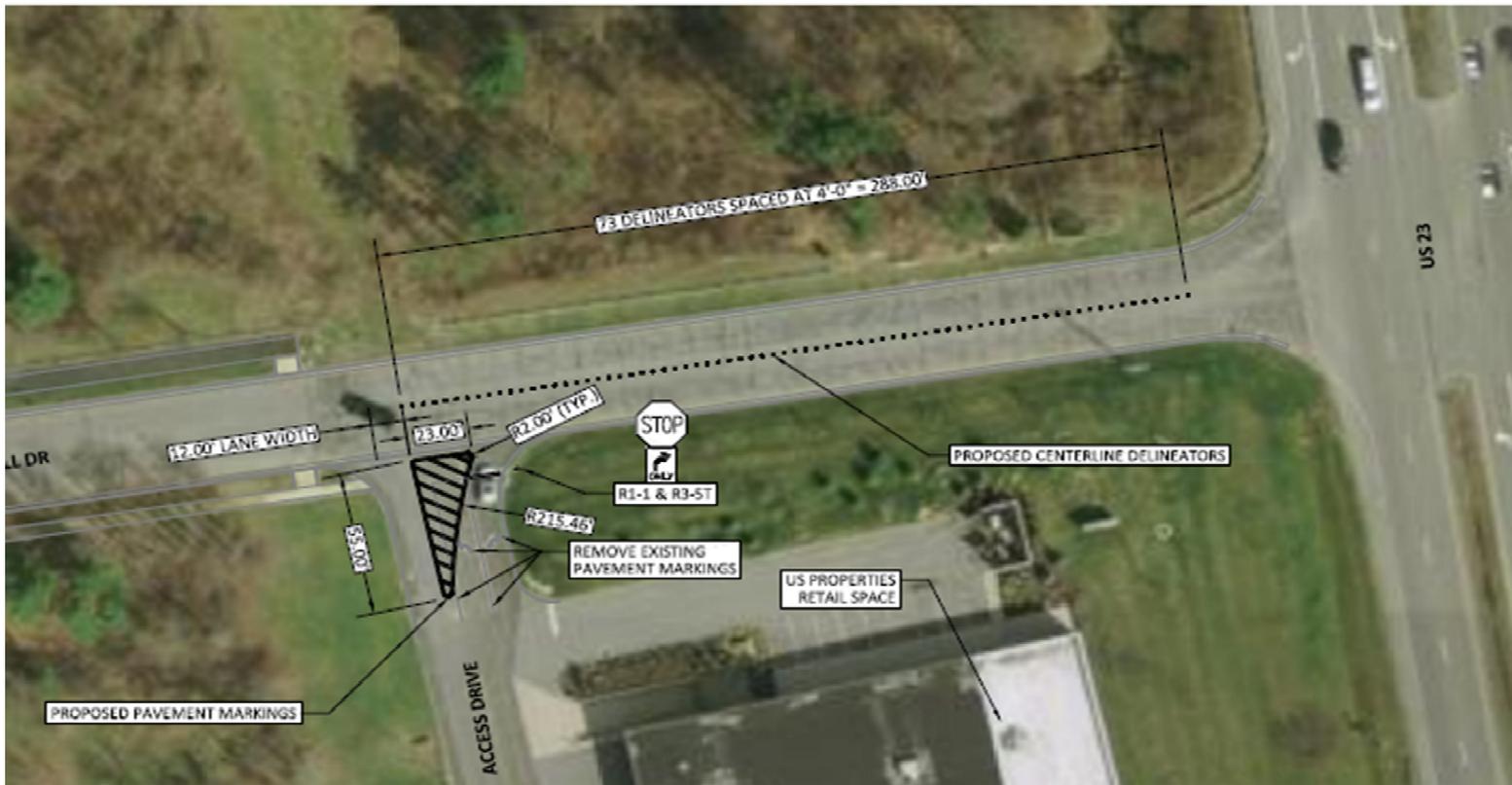
Westbound

1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	>65
0	2	24	123	838	1801	703	70	9	1	0	0	0	0

85 percentile = 31

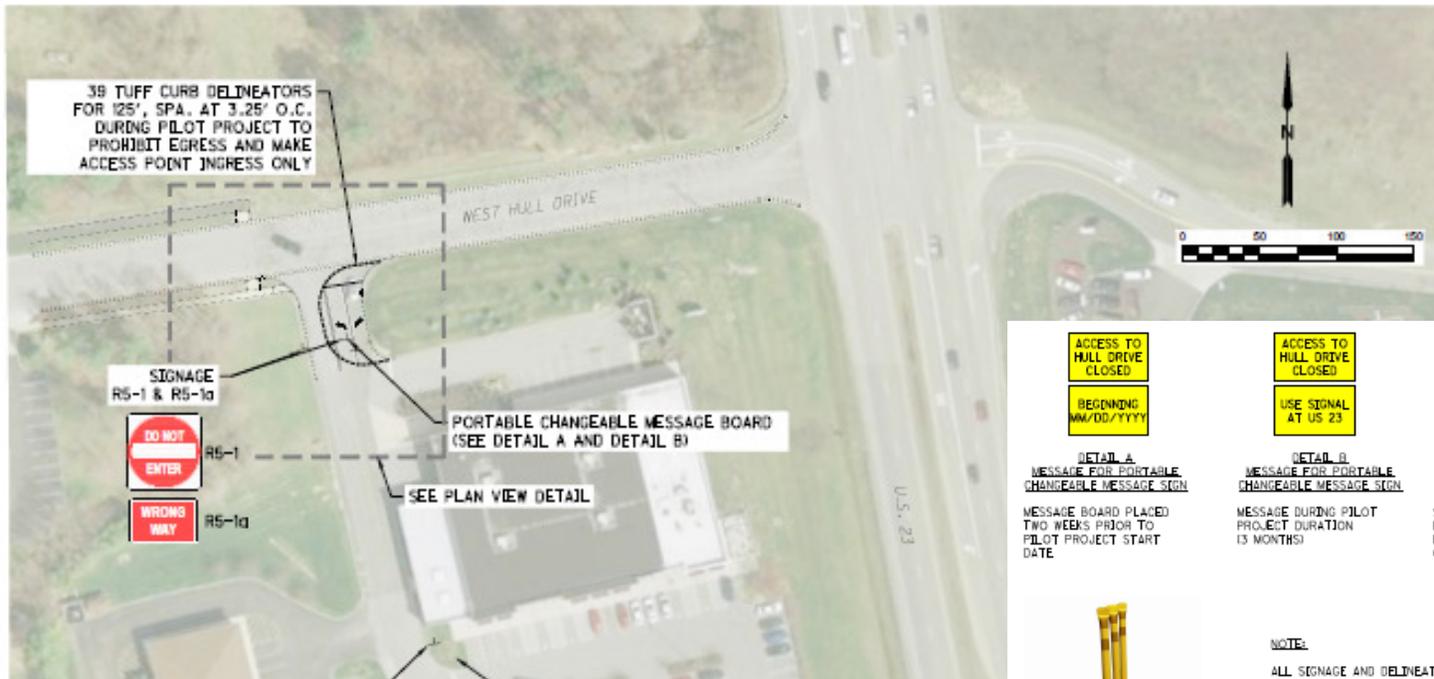
Proposed Pilot Study

North Plaza Access Modifications - Right Out w/Median



Proposed Pilot Study

North Plaza Access Modifications - No Exit to Hull



<p>ACCESS TO HULL DRIVE CLOSED</p> <p>BEGINNING MM/DD/YYYY</p> <p>DETAIL A MESSAGE FOR PORTABLE CHANGEABLE MESSAGE SIGN</p> <p>MESSAGE BOARD PLACED TWO WEEKS PRIOR TO PILOT PROJECT START DATE</p>	<p>ACCESS TO HULL DRIVE CLOSED</p> <p>USE SIGNAL AT US 23</p> <p>DETAIL B MESSAGE FOR PORTABLE CHANGEABLE MESSAGE SIGN</p> <p>MESSAGE DURING PILOT PROJECT DURATION (3 MONTHS)</p>	<p>NO ACCESS TO HULL DRIVE</p> <p>USE SIGNAL AT US 23</p> <p>DETAIL C MESSAGE FOR CUSTOM MADE STATIC SIGNS</p> <p>SIGNS TO BE PLACED DURING THE PILOT PROJECT DURATION (3 MONTHS)</p>
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NOTE:
ALL SIGNAGE AND DELINEATORS TO BE SUPPLIED AND INSTALLED BY THE CITY OF DELAWARE

TUFF CURB DELINEATORS

Pilot Study Pro's/Cons

▶ Pros

- ▶ “Potential” to divert up to 1450 VPD off W. Hull Drive
- ▶ Allows for accurate count of vehicle diversion
- ▶ Allows for determination as to where vehicle trips divert to
- ▶ Moderate Cost to implement - \$7500

▶ Cons

- ▶ Temporarily introduce confusion to Plaza visitors
- ▶ Introduce congestion/delay at main entrance signal at US23
- ▶ Divert traffic to neighboring streets
- ▶ Increase accident risk at US23/Hull Drive (NBLT movements)

Pilot Study Implementation

- ▶ 30 day advance notification to Plaza visitors
- ▶ Add “Temporary” and “Begin/End” dates to signage
- ▶ Study duration for 60 to 90 days w/ flexible start date
- ▶ Adjust timing at plaza signal as needed to limit an congestion
- ▶ Count ADT’s at key measuring points during pilot
- ▶ Review results publically before conclusions/recommendations are made by the Parking & Safety Committee

Public Comments (Facebook)

(3) Supportive Comments

- ▶ Feel bad for residence because motorists speed through that neighborhood and don't stop at the stop sign.
- ▶ Too busy for a residential street
- ▶ Too much cut-through traffic

Public Comments (Facebook)

(31) Non-supportive Comments

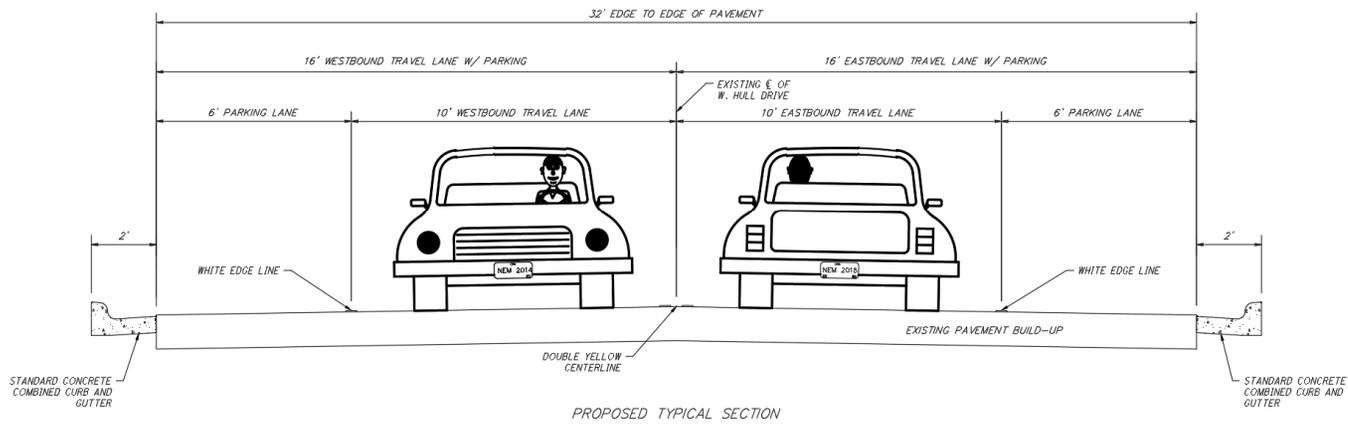
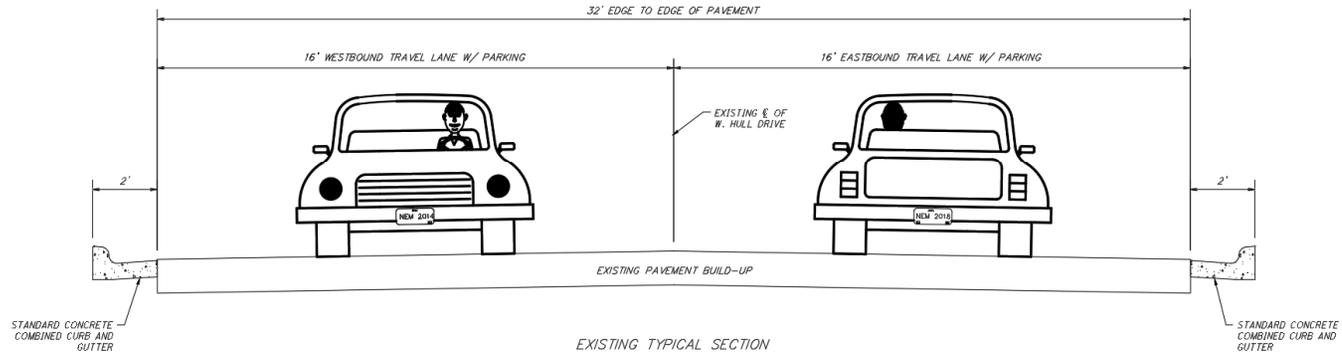
- ▶ Residents should have thought about the traffic before buying a home on West Hull Drive. Traffic has been that way long before they purchased.
- ▶ Drivers have a right to use any public street
- ▶ Many neighborhood roads have high traffic and speeders
- ▶ Drivers will just turn left onto Hull from US23, which is dangerous already
- ▶ Traffic will divert to other neighborhood streets
- ▶ It's a safer option than using 23
- ▶ Shopping Center businesses won't like the change
- ▶ The reason this is an issue is because a council member lives on the street

Alternate Pilot Study Initiative

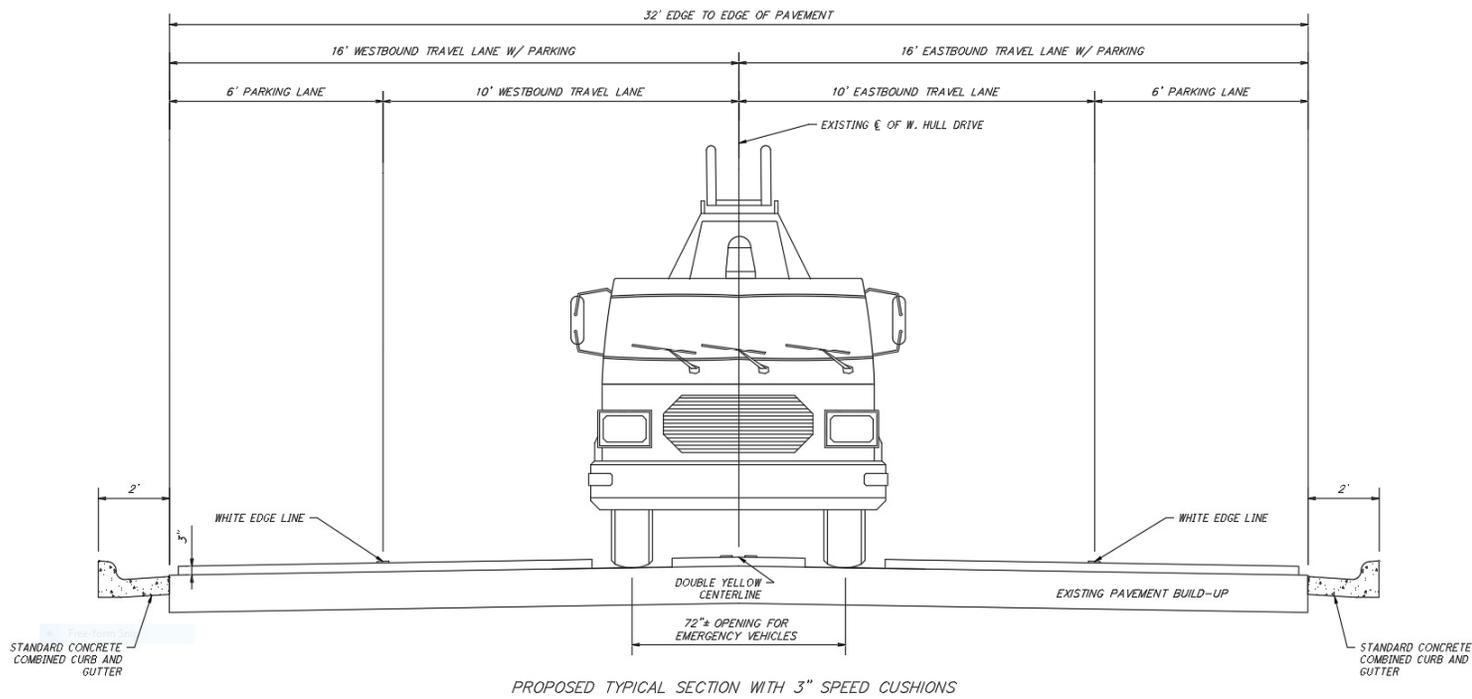
Traffic Calming Measures

- ▶ Lane Narrowing with edge line striping
- ▶ Volume reduction through speed bumps
- ▶ Driver awareness through DSFB signage

Typical Pavement Cross-section



Typical Pavement Cross-section



Lane Narrowing

- ▶ Slows traffic but not likely to reduce cut-through volume
- ▶ Moderate cost installation - \$6500
- ▶ Requires routine maintenance



Temporary Speed Bumps

- ▶ May divert traffic due to motorist inconvenience of traversing bumps
- ▶ Expensive to install - \$25,000
- ▶ Reduced snow plowing effectiveness
- ▶ May impact emergency response



Speed Feedback Signs

- ▶ Minor reduction in vehicle speeds (1-2 MPH)
- ▶ Moderate Cost - \$7500
- ▶ Provide neighborhood with feeling of heightened enforcement



Traffic Calming Costs

Pavement Striping	\$6500
Temporary Speed Bumps	\$25,000
<u>Dynamic Speed Feedback Signs (DSFB)</u>	<u>\$7500</u>
	\$39,000

*Requires City policy on funding the installation of traffic calming measures and devices

Committee Recommendations following Public Input

1. Advance Plaza Access Modification Pilot Study?
2. Advance Traffic Calming Pilot Initiative?
3. No changes to West Hull Drive?
4. Other proposals?

Roadway Striping as a Traffic Calming Option

IN LIEU OF TRADITIONAL TRAFFIC CALMING, ROADWAY STRIPING AS A TRAFFIC CALMING OPTION IS A VIABLE, LOW-COST ALTERNATIVE TO TRADITIONAL VERTICAL/HORIZONTAL ROADWAY DESIGN FEATURES. THE ROADWAY STRIPING ALTERNATIVES HAVE LESS DETRIMENTAL IMPACT TO EMERGENCY SERVICES, ARE LESS COSTLY TO CONSTRUCT, AND CAN SUCCESSFULLY REDUCE SPEEDS FROM TWO TO MORE THAN SEVEN MILES PER HOUR.

BY ROBERT KAHN, P.E. AND ALLISON KAHN GOEDECKE, MBA

INTRODUCTION

Traditional traffic calming techniques include vertical and horizontal displacement of the roadway surface, which can be effective in reducing speeds and cut-through traffic on roadways. These roadway design features can include speed humps, cushions, chokers, chicanés, medians, mini traffic circles, diverters, and full/partial roadway closures. While these features can have significant benefits to a community, they are sometimes difficult to implement as a result of potential negative impacts to local residents, emergency service departments, and persons with disabilities and may not be consistent with public agency policies.

In lieu of many of the traditional traffic calming devices, roadway striping can be implemented as a traffic calming option that is a viable, low-cost alternative to vertical/horizontal displacement traffic calming features. The roadway striping alternatives

- Have less detrimental impacts upon emergency services;
- Are less costly to construct;
- Provide greater flexibility to meet future changes;
- Have no adverse impact to highway drainage;
- Are recognized by local residents as standard traffic control devices;
- Can provide bike/parking lanes;
- Can successfully reduce speeds from one to more than seven miles per hour. Even greater speed reductions have been documented in some case studies; and

- Can be implemented quickly.

A number of roadway striping calming alternatives have been successfully installed in Southern California with positive results. In many cases, these have been implemented on private streets and have resulted in reduced speeds in these communities. These private streets have been designed to pub-

lic street standards. Traffic calming striping has also been used on public streets in Southern California. The calming alternatives that have been implemented follow standard *California Manual on Uniform Traffic Control Devices* (CMUTCD) requirements. These traffic calming options have been implemented in a timely and cost-effective manner and are easily understood by the local residents and driving public. They have resulted in some speed reductions, which were desired by the local residents. While more traditional traffic calming devices (e.g., speed humps) may be required in certain instances to obtain greater speed or volume reductions, roadway striping is a viable traffic calming option in many cases.

TRAFFIC STRIPING AS AN ALTERNATIVE TO STANDARD TRAFFIC CALMING TECHNIQUES

Striping as a traffic calming technique has less disruption to emergency service vehicles, since no vertical or horizontal displacement occurs within the roadway surface. Emergency service requirements are a major barrier to the installation of many traffic calming projects. Roadway striping that is used for traffic calming is universally recognized by the traveling public and emergency agencies. Traffic calming striping gives the visual impression that roadway width has been reduced, which has been shown to slow vehicles down while traveling along a roadway. This type of striping will not slow down emergency service vehicles utilizing the roadway or adversely affect traffic operations. Other types of traffic calming devices are new to some drivers, particularly out-of-the-area drivers who are not familiar with a particular area that has the traffic calming devices.

In addition, there is considerably less cost to striping than other traffic calming techniques. As opposed to \$2,500-\$3,500 USD per installation for speed humps

or speed cushions, the same segment of roadway can be striped for only \$500 to \$1,000 USD. Another advantage of traffic striping as a traffic calming option is future flexibility. Traffic striping can easily be changed in the future by sandblasting the painted striping, if a particular installation is unsuccessful in meeting its goals or needs to be changed. Furthermore, traffic striping can be implemented quickly through conventional construction techniques by existing in-house public works staff or contract services.

Another significant benefit of traffic striping is that it does not adversely affect drainage. Many traffic calming devices such as speed humps, roadway chokers/curb extensions, medians, and chicanes can adversely affect roadway drainage. These devices can constrict normal drainage patterns within the roadway surface, which could affect drainage for the roadways. This can require additional roadway maintenance for local public works departments.

Traffic striping as a traffic calming device can effectively reduce speeds on a roadway. This is particularly effective on long, straight roadways where there are wide travel lanes for long distances. Before-and-after speed surveys by RK Engineering Group, Inc., with which the author is affiliated, have shown that speed reductions in the range of one to more than seven miles per hour are easily accomplished through roadway striping, especially for wide local streets with a curb-to-curb width of 36 to 40 feet. Another advantage of roadway striping is that it can provide for bike lanes or parking areas adjacent to the travel lanes as part of the "complete streets" system. These bike or parking lanes are used to define the various functions of the roadway: not only vehicular travel but also vehicle access to the neighborhood, parking, and accommodations for other modes of transportation, such as bicycles.

STRIPING ALTERNATIVES

There are numerous striping alternatives that can be used for traffic calming. The basic concept of traffic calming striping is to reduce the driver's perceived width of the roadway. By doing this, the drivers tend to reduce speed and may also be diverted from a particular route as a



Figure 1. Typical traffic calming striping.

result of the reduced speed. The striping alternatives can consist of adding the following:

- Centerline stripe;
- Edge lines;
- Centerline plus edge line;
- Striped median;
- Striped choker or chicane;
- Striped speed hump without the raised speed hump; and
- Psycho-perceptive striping.

Centerline striping consists of adding a typical double-yellow centerline stripe or single-dash yellow line in the roadway. This separates the direction of traffic and reduces the roadway width of the travel lane to the driver. White 4-inch edge lines can be added to the right and left side of the roadway where there is sufficient width for the 8-foot parking lane. The parking lane can be provided and separated by the 4-inch white edge line. A combination of both centerline and edge line striping is the most effective method of reducing the overall travel way width of the roadways. This can be provided on typical local streets and will provide for 10-12 foot travel lanes and 7-8 foot parking lanes. A sample of this design is shown in Figure 1.

Another method of reducing the roadway width is by providing a striped median. The median can be provided by double-yellow centerline stripes or can

be a two-way left-turn lane, which provides left turns from the roadway to the adjacent properties or across the roadway itself. Another option for reducing roadway width is striping chokers or chicanes. These can be striped with a white 8-inch channel to provide the delineation of the choker or chicane. Although not as prominent as the raised curbing of a typical choker or chicane, it does provide some of the same operational features as the raised curbing for chokers or chicanes by requiring the driver to slow while traveling the traffic calming area.

Another traffic calming option is to provide "striped" speed humps across the roadway. These can be effective where normal speed humps cannot be implemented, such as a hilly area or where grades exceed 8 percent. While limited operational data is available on this type of striping, it can give the impression of a speed hump in the roadway area, therefore slowing vehicles. "Psycho-perceptive" striping has also been used in conjunction to implementation of speed humps. This type of striping is shown in CMUTCD (Figure 3B - 31). Smaller stripes are provided, initially going to larger stripes when approaching the traffic calming device. A photo of this type of striping is included in Figure 2. The evaluation of the effectiveness of optical speed bars was presented in the November 2001 (Eric Meyers) and March 2009

traffic calming striping, the 85th percentile speed along Chambord ranged from 45 to 47 miles per hour, and the average speeds ranged from 40 to 41 miles per hour.

Traffic calming striping was implemented along the entire length of Chambord. This included a double-yellow centerline and 4-inch edge line stripes 8 feet from the curb face. After the traffic calming striping was implemented, the 85th percentile speed was reduced to 37 to 39 miles per hour and the average speed decreased to 35 to 36 miles per hour throughout the length of Chambord as shown in Table 1.

*Case Study No. 2
(August 2005–December 2007)*

Traffic calming striping was implemented in south Orange County within the city of San Clemente, California, USA at the Reserve Community Association. This project consists of a large number of single-detached family dwelling units with a recreation center located in the southern portion of the community. The project has four electronic gates, which provide access to an adjacent arterial highway (Camino Vera Cruz). This community had four roadways serving a series of cul-de-sacs throughout the community, both north and south of Camino Vera Cruz.

The main roadways serving the community south of Camino Vera Cruz were 40-foot curb-to-curb width streets and those roadways serving the northerly section of the community had a curb-to-curb width of 36 to 38 feet. Existing traffic volume and speeds were collected throughout the community before traffic calming was implemented. The 85th percentile speeds ranged from 23 to 34 miles per hour prior to the implementation of traffic calming striping. Before-and-after 85th percentile speeds are summarized in Table 1.

Traffic calming striping consisted of adding double-yellow centerlines and white 4-inch edge lines on the wider roadways and the striping of edge lines only for the narrower roadways. The 85th percentile was reduced to some degree after the implementation of traffic calming striping. The 85th percentile speeds were reduced to 22-33 miles per hour, with some minor reductions after the implementation of the striping. The rec-

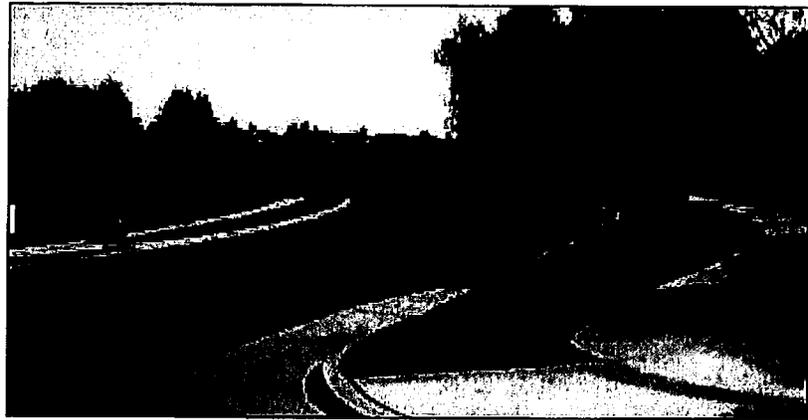


Figure 4. Chambord Road before restriping.

Table 1. Before-and-after speed surveys.

Location	Roadway	85th% Speed	
		Before Traffic Calming Striping (mph)	After Traffic Calming Striping (mph)
Case Study #1 Newport Ridge North (Newport Beach)	• Chambord N/O Rivay	46	37
	• Chambord S/O Musset	47	39
	• Chambord S/O Baryemon	45	39
Case Study #2 The Reserve (San Clemente)	• Montana del Sol N/O Camino Vera Cruz	23	22
	• Colina Rodante S/O Camino Vera Cruz	32	30
	• Calle de Los Arboles N/O Camino Vera Cruz	27	26
	• Calle de Los Arboles S/O Camino Vera Cruz	34	33
Case Study #3 Oak Creek (Irvine)	• Eagle Creek W/O Indigo	37	31
	• Eagle Creek W/O Palm Wood	38	27
Case Study #4 Summit at Turtle Ridge (Irvine)	• Garden Terrace E/O Hedgewood	31	30
	• Crest Terrace N/O Blue Summit	29	29
	• Canyon Terrace N/O Cezanne Valley	33	31
	• Valley Terrace S/O Climbing Vine	30	28
Summit at Turtle Ridge (Irvine)	• Garden Terrace N/O Summit Park	31	30
	• Crest Terrace W/O Summit Park	29	29
	• Canyon Terrace N/O Summit Park	33	31
	• Valley Terrace N/O Summit Park	30	28
	• Summit Park Drive at Valley Terrace	46	44
	• Summit Park Drive W/O View Terrace	44	44
	• Summit Park Drive E/O Garden Terrace	43	42
	• Summit Park Drive at Garden Terrace	39	39

ommended speed limits ranged from 25 to 35 miles per hour depending on the location and the 85th percentile speed. Although not as significant of a reduction in comparison to the Newport Ridge North Community, speeds were reduced 1 to 2 miles per hour with the traffic calming striping. The smaller reduction in speed was probably caused by the fact that the true existing speeds before the traffic calming measures were implemented were lower than the existing speeds in the Newport Ridge North Community.

Case No. 3 (June 2002–December 2009)

The Oakcreek Village Community located in the city of Irvine, California, USA also implemented traffic calming striping. This is a private community with two sets of electronic gates located at the east and west ends of the project. The roadway layout for the Oakcreek Development is a linear alignment with very little curvature. The Oakcreek Development is served by a single roadway (Eagle Creek) which has direct access to driveways and homes along its entire length of 0.50 miles. The Oakcreek Village Community is served by two electronic gates located on the northwest and southeast end of Eagle Creek.

Eagle Creek is a two-lane, undivided street with a curb-to-curb width of 36 feet with sidewalks on both sides of the street. The 85th percentile speed on Eagle Creek before traffic calming striping was 37 to 38 miles per hour. The community felt that this was excessive, since the prima facie speed limit is 25 miles per hour for this type of roadway. Also, there was a concern that the crosswalk across Eagle Creek served an adjoining elementary school where there was a significant amount of pedestrian crossing.

The traffic calming striping consisted of a double-yellow centerline stripe along with white 4-inch edge lines on both sides of the street. Initially this was constructed with a 7-foot parking lane on each side of the roadway and 11-foot travel lanes in each direction. Since the original implementation of traffic calming striping, the travelway has been reduced further to 10 feet and parking lanes were increased in width to 8 feet. The 85th percentile speed after the traffic calming ranged from 31 to 27 miles per hour (see Table 1). The

**ANOTHER ADVANTAGE
OF TRAFFIC STRIPING
AS A TRAFFIC CALMING
OPTION IS FUTURE
FLEXIBILITY. TRAFFIC
STRIPING CAN EASILY BE
CHANGED IN THE FUTURE
BY SANDBLASTING THE
PAINTED STRIPING,
IF A PARTICULAR
INSTALLATION IS
UNSUCCESSFUL IN
MEETING ITS GOALS OR
NEEDS TO BE CHANGED.**

traffic calming measures implemented by the community of Oak Creek Village have been successful in reducing speeds as much as 6 to 11 miles per hour. After careful review, the original recommended striping was modified to create 10-foot-wide travel lanes and an 8-foot-wide parking lane. This should further reduce traffic speeds in the area.

Case Study No. 4 (April 2008–April 2010)

The community of the Summit at Turtle Ridge in the city of Irvine requested traffic calming to reduce the vehicle speeds on some of its local streets. The Summit at Turtle Ridge is a private manned-gated

community with a primary collector road (Summit Park Drive). This hillside community included numerous cul-de-sac streets where speeds were generally low and consistent with what would be expected in the local street system. However, the local community association felt that these speeds were too high and traffic calming options should be investigated.

For this study, RK surveyed four local streets in the community. This included Garden Terrace, where the 85th percentile speed was 31 miles per hour before the implementation of traffic calming striping and was reduced to 30 miles per hour after implementation. On Crest Terrace the 85th percentile speed was only 29 miles per hour before traffic calming striping and remained at 29 miles per hour after the implementation of the striping. Canyon Terrace was the location with the highest speeds in the community on the local streets, where the 85th percentile speed was 33 miles per hour. This speed was reduced to 31 miles per hour after the implementation of traffic calming striping. The final location where traffic calming was implemented was Valley Terrace Street. This cul-de-sac had a speed of 30 miles per hour before implementation of the striping and 28 miles per hour after traffic striping was implemented.

In the community of the Summit at Turtle Ridge, the speeds were already low and generally consistent with what would be expected for local residential streets. However, the community was concerned with the speeds; therefore, rather than placing more aggressive traffic calming devices (e.g., speed humps, chokers, and so forth), traffic calming striping was utilized as the preferred option within the community. The recommended traffic calming striping included centerline and edge line striping with parking on one or both sides of the street depending on whether the streets were 32- or 36-foot wide. Although the speed reductions were not substantial within the community, the community was satisfied with the reduction of speeds as a result of the implementation of traffic calming striping. The relationship of speed reduction with traffic calming striping can be seen in Figure 5.

One conclusion that can be reached from the various case studies is that if local streets are operating at speeds typical for

these types of roadways (i.e. 25-32 mph), then only minor speed reductions can be obtained by traffic calming striping. Where speeds are significantly higher (i.e., more than 35 mph), then much greater speed reductions can be achieved from traffic calming striping.

COMPARISON TO OTHER TRAFFIC CALMING TECHNIQUES

The use of traffic calming striping compares favorably to other traffic calming techniques. Although speed reduction can vary from site to site, positive speed reductions can be anticipated with the traffic calming, depending on the specific roadway configurations and the width of travel way. There are significant pros and cons to all types of traffic calming devices, as summarized in Table 2.

As can be seen from Table 2, traffic calming striping can typically result in speed reductions of approximately one to seven miles per hour depending on the situation. Speed hump and speed cushions have considerable speed reduction capabilities of approximately 8 miles per hour. Chokers and chicanes can reduce speeds 3 to 6 miles per hour, and medians and pavement texture can result in 2 to 3 miles per hour reduction. When there are situations that require speed reductions on local roadways, traffic calming striping can be considered the first step in the traffic calming process. More aggressive traffic calming devices such as speed humps/speed cushions, chokers, chicanes, medians, and pavement textures can cost considerably more but can be utilized in the event that the traffic calming striping is not successful in reaching the speed-reduction goals set by the community.

COST COMPARISON

One of the major advantages of traffic calming striping is its cost. Not only can traffic calming striping be implemented less expensively than many other options, but it also can be modified or removed without major cost implications. An approximate cost comparison of various traffic calming devices is included in Table 2.

SAFETY CONSIDERATIONS

There are numerous safety considerations for implementing traffic calming

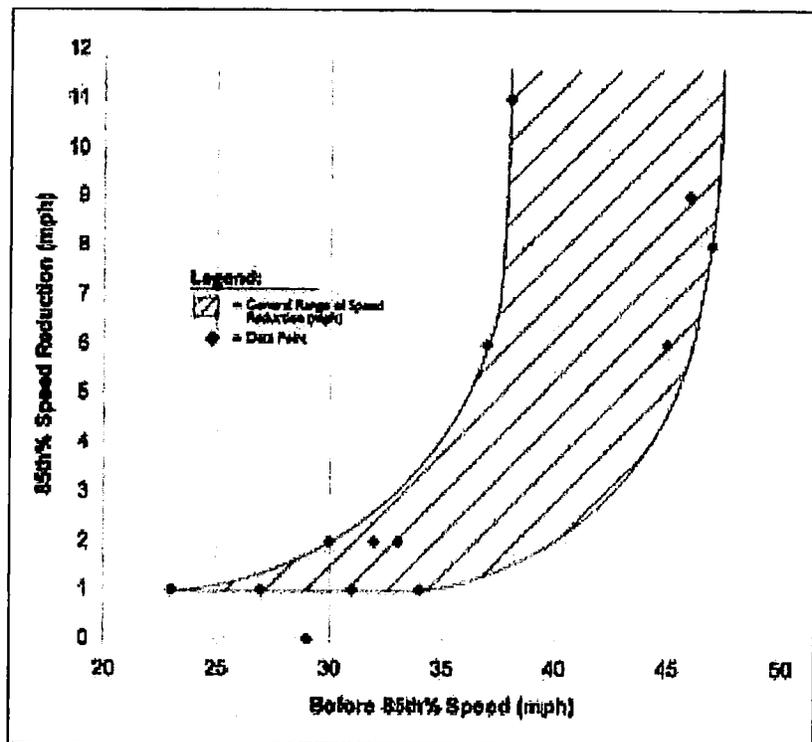


Figure 5. Speed reduction with traffic calming striping.

devices. Anytime that the vertical or horizontal displacement of the roadway surface occurs, there is a potential for vehicles going out of control, hitting objects, or other actions which could be detrimental to the safety of the driver and passengers of the vehicle. Furthermore, impacts to emergency service vehicles can indirectly affect safety when responding to emergency events.

Generally, traffic calming striping minimizes safety considerations, since they follow standard traffic engineering practices pursuant to the CMUTCD. Drivers are familiar with these types of traffic control features and respond accordingly. This is true not only for local residents who are familiar with the traffic calming implemented in an area but also for drivers from outside the area that are unfamiliar with the traffic calming installations.

Speed humps do reduce vehicle speed if properly designed and when adequate signage/pavement markings are provided. Speed humps can have an adverse affect on safety—but only if drivers ignore them and if reduced speeds do not occur. Speed humps can also reduce travel times for

emergency service vehicles, which have an indirect impact on safety.

Speed cushions have a similar effect on safety as speed humps. However, they can be traversed better by larger vehicles, including emergency service vehicles, which can travel through the speed cushions at a normal speed as opposed to a typical speed hump. This is a major advantage of speed cushions over speed humps.

Chokers can affect safety if they are hit by vehicles. Proper signage and pavement markers are necessary to ensure that this does not occur. Chokers can improve safety for pedestrians by providing a shorter walking distance for crosswalks. Chicanes, similar to chokers, can have a safety impact if a vehicle strikes them while traversing through the traffic calming device area. Implementation of sharp curb-width transitions can result in vehicle collision with the curb, causing vehicle damage and possible out-of-control vehicle operations.

Medians have been shown to improve safety by separating the direction of travel of vehicles. However, when implemented in only selective areas, vehicles can hit the ends of medians, causing damage to the

Table 2. Comparison of traffic calming devices.

Traffic Calming Technique	Pros	Cons	Speed Reduction (mph)	Cost2
Speed Hump	<ul style="list-style-type: none"> Effectively reduces speed by approximately 8 mph. Can cause some diversion of excess traffic volumes. 	<ul style="list-style-type: none"> Not accepted by many local jurisdictions and emergency service agencies. Improper driving can cause vehicle damage and can cause vehicles to go out of control. Moderate cost considerations. Can impact bicycles/motorcycles. Difficult to remove. 	8	\$1,500 to \$3,000
Speed Cushion	<ul style="list-style-type: none"> Effective in reducing speeds up to 5 miles per hour. More acceptable to public agencies / emergency service agencies, because can slow normal size vehicles but allows larger emergency vehicles to pass without speed reductions. 	<ul style="list-style-type: none"> Some agencies and emergency service agencies do not support these devices. Cost for construction is moderate. Difficult to remove. May impact bicycles/motorcycles. 	5	\$2,500 to \$3,500
Chokers and Chicanes	<ul style="list-style-type: none"> Effectively reduces traffic speeds approximately 3 miles per hour. Can reduce roadway width to reduce walking distance for pedestrian (which is a safety benefit). Can be enhanced with landscaping to improve aesthetics. 	<ul style="list-style-type: none"> Expensive to implement. Can cause drainage issues. Difficult to remove in the future if not effective. Some loss of parking. Can impact bicycles. 	3-5 Up to 6	\$7,000- \$15,000 per pair \$10,000- \$15,000
Medians	<ul style="list-style-type: none"> Can reduce speeds to some degree. Can provide aesthetic benefits to the community. 	<ul style="list-style-type: none"> Costly to implement. Difficult to remove if not successful. Can cause additional maintenance costs. Water overall on pavement. May lose parking. 	2-3	\$5,000- \$15,000
Pavement Texture	<ul style="list-style-type: none"> Can cause minor reduction in speed. Can be aesthetically pleasing. Can be tied into crosswalks or intersections to define channelized areas for pedestrians. 	<ul style="list-style-type: none"> Costly to implement. Difficult to remove. Can effect some types of pedestrians crossing the street. Can cause noise impacts. 	Limited data	\$5-\$16 per sq. ft.
Mini Traffic Circles	<ul style="list-style-type: none"> Minor reduction in speed. Improves aesthetics. Slows traffic through the intersection. 	<ul style="list-style-type: none"> Costly to implement. Can confuse drivers regarding which way to travel through an intersection. May affect bicycles and pedestrians. Can impact left turns for large vehicles. Can slow emergency service vehicles. 	4-6	\$10,000- \$60,000
Traffic Calming Striping	<ul style="list-style-type: none"> Effective in reducing speeds from 1 to 7+ miles per hour. Accepted by many public agencies and emergency service agencies because they are standard traffic control. Easy to change if required in the future. Less costly option to install. Installation can be implemented quickly. Can be removed more easily than other options (sand blast). 	<ul style="list-style-type: none"> Some limitations in speed reduction. Less effective when speeds are already low. 	1-7+	\$500- \$1,000 per 500 feet

vehicles, driver/passenger, and can also cause vehicles to go out of control. If medians are not properly designed, they can cause water to flow into the pavement. This can cause pavement deterioration and loss of control of vehicles.

Pavement texture has limited impact on safety, although vehicles can possibly lose traction, depending on the type of texture during wet conditions. Pedestrians crossing on pavement texture can trip or slip depending on the pavement type and condition. In addition, pedestrians (especially children) may not see the textured pavement as a part of the "street," which make them less aware of traffic.

Mini traffic circles can cause vehicles to hit the curbs or cause other accidents. Also, if such traffic circles are not properly designed, trucks can have a difficult time navigating the intersection and could hit objects in the roadway.

Traffic calming striping generally has a positive impact from a traffic safety standpoint. Traffic calming striping should be implemented pursuant to the CMUTCD requirements with respect to location, type, and placement of the striping. Where used as transitions, striping should be properly designed based upon the operating speed of the vehicles on that segment roadway.

COMMUNITY ACCEPTANCE

The community acceptance of any traffic calming measure is critical in long-term implementation and effectiveness. The vast majority of the professional literature indicates that at least two-thirds of the community must support the traffic calming techniques in order for them to be implemented within the community.

In many cases, vertical and horizontal displacement of traffic calming devices are heavily resisted by the local community and driving public. This is one of the major advantages of traffic calming striping, since it is readily acceptable to the local community because it is already implemented on most roadways throughout communities. Traffic calming striping is understood by the driving public throughout local communities. It causes little damage to vehicles and drivers/pedestrians of the community. It does not adversely effect the operation of vehicles for emergency service agencies. Traffic

calming striping is not permanent and can easily be changed if required in the future. As a result of this, traffic calming striping can be less controversial than more restrictive devices.

CONCLUSIONS

RK Engineering Group, Inc. has completed a review of traffic calming striping as an alternative to vertical or horizontal displacement traffic calming devices such as speed humps, speed cushions, chokers, medians, pavement textures, and other roadway design features. Traffic calming striping has been shown to reduce speeds effectively as a first step of a traffic calming process. Striping is a low-cost traffic calming solution that can have major benefits to the community compared to other vertical/horizontal displacement traffic calming devices, yet still provides substantial benefits in terms of reducing traffic speeds on the roadways.

In conclusion, traffic calming striping is an effective measure in a traffic/transportation engineer's toolbox of traffic calming devices. These roadway striping techniques follow standard design practice, which reduces future tort liability. Traffic striping is a cost-effective and efficient traffic calming method that can be implemented quickly to reduce speeds on roadways. ■

Resources for further information

1. City of Colorado Springs, *Traffic Calming Handbook*. 2003. Accessible at www.springsgov.com/files/TCHandbook.pdf.
2. Remington & Vernick Engineers, *Old Newark Traffic Calming Plan*. 2002. Accessible at www.wilmarco.org/Newark/Newark_traffic_calming_sect1.PDF.
3. Brown, Steven (Fehr Peers), *City of La Habra Traffic Management Program*. 2006. Accessible at www.lahabracity.com/article.cfm?id=191.
4. Ewing, Reid, *Traffic Calming State of the Practice*. Washington, DC: ITE/FHWA. 1999.
5. Delaware Department of Transportation. *Delaware Department of Transportation Traffic Calming Manual*. 2000. Accessible at www.deldot.gov/information/pubs_forms/manuals/traffic_calming/pdf/deldotfinal.pdf.
6. Gulden, Jeff, Reid Ewing. "New Traffic Calming Device of Choice." *ITE Journal*, Vol 79, No. 12, (December 2009): 26-31. Washington, DC: ITE. 2009.

ROBERT KAHN,

P.E. is president of RK Engineering Group, Inc. which is a full-service transportation engineering firm located in Newport Beach, California, USA. Mr

Kahn has more than 40 years of professional experience and has owned his own consulting firm for 23 years. He is a registered engineer in the states of California, Colorado, and Nevada. Mr. Kahn has been involved in the practice of traffic calming since the early 1980s, when he designed some of the first speed humps in Orange County, California. He currently teaches "Fundamentals of Traffic Engineering" for the University of California and has been a guest lecturer at the University of California, Irvine. Mr. Kahn received his B.S. and M.S. in civil engineering from the University of California, Berkeley. He is a fellow of ITE.

ALLISON KAHN GOEDECKE,

MBA is a project manager with RK Engineering Group, Inc. She showed her first interest in the transportation field after completing

a report, titled "Red Light, Green Light," about her father's role in helping communities as a transportation engineer back in 1981. Allison has now worked as a senior transportation planner for more than 12 years, focusing on preparing traffic impact studies for commercial, industrial, institutional, and residential projects. She graduated Phi Beta Kappa from University of California, Irvine, received her MBA from Pepperdine University, and did postgraduate work at Oxford University. She is a member of American Planning Association (APA).

Fire official ties speed humps to response delays

A research report claimed each speed hump adds a 10-second delay for responders

Aug 12, 2016

By Keith Upchurch
The Herald-Sun

DURHAM, N.C. — Durham's speed humps often delay firetrucks and ambulances in getting to their destinations and increase risk to those they're trying to serve, a fire official says.

Deputy Chief Chris Iannuzzi of the Durham Fire Department wrote a paper on Durham's speed humps while attending the elite Executive Fire Officer Program in Emmitsburg, Maryland.



A new paper by Deputy Chief Chris Iannuzzi claims that each speed bump adds a 10 second delay for fire trucks. (Photo/City of Durham, NC)

Iannuzzi and Assistant Durham Fire Chief Andy Sannipoli recently graduated from the four-year program, which accepts only about 300 people nationwide each year.

In his research, Iannuzzi found Durham fire trucks are delayed an average of 10 seconds for every speed hump they travel over on the way to a fire or other emergency.

Because fire doubles every 60 seconds, delays can make a difference in the severity of damage and affect the outcome for someone having a heart attack or other medical emergency.

"Anecdotally, there have been cases when speed humps slowed firetrucks' arrival," Iannuzzi said. "We haven't collected specific data, so I can't go back and say it happened on a specific call, but we're trying to make sure we get that data."

Iannuzzi said that if a fire truck crosses several humps, the fire will likely be worse when firefighters arrive.

Likewise, firefighters often respond to medical emergencies when every second counts.

"For someone who's not breathing, every minute of delay in starting defibrillation means there's a 10 percent decrease in survivability," Iannuzzi said. "Then it starts to make a difference."

He cited a Texas study showing speed humps resulted in lost lives there because of emergency vehicle delays.

Iannuzzi said he couldn't document a case where a speed-hump delay caused a fire death in Durham, but there was one case that made him wonder.

"I was responsible for that call," he said. "A man died, and speed humps were there. It's impossible to say what caused it. Was there a delay? Yes. Was that delay what caused the man to die? I can't say, because I don't know at what point he died. But I think about it."

Iannuzzi said there are streets in Durham where he believes speed humps should be removed.

On Swarthmore Drive, for example, a fire truck must drive over four speed humps if it turns right, slowing it by 45 to 60 seconds, he said.

Iannuzzi said the Fire Department plans to be more assertive in opposing speed humps that would create a serious problem for emergency vehicles.

"We haven't asked that any be removed, but that's something that maybe we'll do," he added.

The problem can be worse for ambulances, because humps slow them in both directions and can delay a patient's arrival at a hospital.

Iannuzzi said the Executive Fire Officer Program teaches skills that benefit Durham.

"It helps develop skills and perspective on the fire service that help us run an effective organization," Iannuzzi said.

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McClatchy-Tribune News Service

Tags > [Education and Training](#) • [Response Time](#)

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PARKING AND SAFETY MINUTES
City Council Chamber
November 18, 2002 at 7:00 p.m.

Members Present: Todd Hanks, David Berwanger and Jim Moore

Staff Members Present: Public Works Director Tim Browning, Customer Service Liaison Linda Mathews, Public Works Superintendent Joe Bullis, Traffic Division Crew Leader Keith Blankenship, Police Chief Linda Black, Deputy Engineer Terry Lively, Engineer Bill Ferrigno and Jake Johnson, Traffic Engineer Technician

Item 1: Roll Call

The meeting of the Parking and Safety Committee began at 7:00 p.m. and at roll call all members of the committee were in attendance.

Item 2: Approval of Minutes

Mr. Lively stated that he had a couple of corrections – Page 4, under Item 10, 2nd paragraph, third line down, insert the word “south” before “side” so that the sentence would read: “The requirement for a huge embankment construction project along the south side of US 42, to include ...”.

Page 5, 2nd full paragraph from the top, second to the last sentence, the word “band” should be “ban”. Same page and paragraph, last line, replace “band” with “ban”. Also next paragraph down, second line, and insert “parking on” before “that” so the sentence would read: “...whether or not parking on that side of the road poses ...”.

Mrs. Mathews stated that she had a correction on Page 4, first paragraph under Item 10, sixth line from the top; the words “a typical” should be one word “atypical”.

Mr. Hanks moved to approve the October 21, 2002 Meeting Minutes, as amended, seconded by Mr. Moore and approved by an all aye vote.

Item 3: Update on Proposed Modifications to Traffic Patterns along West Hull Drive

Mr. Ferrigno, City Engineer, reported that this issue has been worked on with City Staff for more than three years – listening to the residents on all roads as far as traffic issues and specifically Hull Drive. Over the past six months, the residents of Hull Drive have been putting some pressure on the City to look at the traffic issue very seriously. A member of City Council did approach the City Manager and himself to see if there was anything that could be done to reduce traffic on Hull Drive. The City conducted traffic counts before the US23/Rt. 42 project started and we have performed many counts since the project has been completed. We have seen some increase in traffic in that local area because that south side is much more assessable now to not just local traffic but regional traffic trying to get down to the commercial area. Mr. Ferrigno stated that he would like to talk tonight about the proposal that was sent in the mail, which was

not sent out as a plan that is going to be done. The proposal was just notification that we have looked at some issues, have looked at a potential way to reduce Hull Drive traffic and to inform the community that this needs to be a discussion issue so everyone has a chance to put in their input.

Mr. Ferrigno stated that one of the things that the City looked at with the Hull Drive issue was the amount of traffic on Hull Drive. The expression "cut through traffic" has been thrown around a lot and "cut through traffic" by definition would be a car traveling a road that has no business in that neighborhood at all other than using that road to pass from Point A to Point B. There is really no way to define on any road how much is the "cut through traffic" without doing a stop survey and the City does not have the funds or mechanism to do that. It is clearly understood that Hull Drive, probably more than any other road, experiences heavy "cut through traffic". The City did some comparisons to similar alike streets to Hull Drive – residential streets that serve somewhat as a collector and have homes fronting on the road. The list of roads that we used in our comparison were – 1) Heritage; 2) Buehler Drive; 3) Executive Blvd.; 4) West Hull Drive; 5) Cottswold; 6) West Belle; 7) Lexington Blvd and 8) Hawthorn Blvd., which are all very similar in appearance to Hull Drive. (Mr. Ferrigno reviewed the traffic numbers). As the traffic counts show the problem is not specific to Hull Drive – the City has many residential roads with large amounts of traffic on them. We looked at the total amount of traffic at our counting points and Hull Drive had 44% of the total traffic counted, Cottswold 30% and Hawthorn Blvd. 26%.

Mr. Ferrigno stated that when the City looked at the Hull Drive issue the prime parameter was to reduce traffic on Hull Drive and there are only a couple of ways to make that happen – 1) make the cars disappear or 2) prohibit the cars from going down the road and the only way to prohibit the cars is to preclude them from either going east or westbound. We looked at both – one-way traffic eastbound and one-way traffic westbound to see which would have minimum impact on neighborhoods. The option that minimized the impact on both Cottswold and Hawthorn was eliminating westbound traffic. The elimination of westbound traffic was simply providing a single one-way lane right between where Dr. Green's office is and the entranceway to the commercial shopping center, which prevented several hundred trips per day from being able to go west on Hull Drive. If traffic is not on Hull Drive, it will probably end up on Hawthorn or Cottswold Drive. The proposal that was sent out would have severe impacts on Dr. Green's business, which Dr. Green addressed in his letter of November 7, 2002. The City also had a Plan B, which limits traffic on West Hull Drive one-way but forces the one-way point further down, further west on Hull Drive to Hull Court. The reason the location was chosen on the first proposal was that people coming in on Hull Drive off of US 23 can have the option of turning into the shopping center – they do not get stuck on a one-way road with no way to turn around. To move further pass Dr. Green's office to maintain two-way traffic there, the next logical point was Hull Court where you already have a cul-de-sac for turnaround purposes. One of the things that Staff looked at also was some of the distributions of traffic – where all the westbound traffic is coming from and the residents of Hull Drive can tell you that they are coming out of the commercial shopping center. (Mr. Ferrigno reviewed traffic count figures at the commercial shopping center)

Mr. Ferrigno stated that the third option that the City looked at did not limit Hull Drive to one-way – it maintained it as two-way and the people coming out of the shopping center (at Sears Hardware) would be forced to take a right down to Rt. 23 which would force traffic into Rt. 23. This intersection is difficult especially at peak times. None of the options are good options and our direction was to find ways to limit traffic on Hull Drive, which is what we have presented tonight. One of the first things that need to be done is that the residents of West Hull Drive need to have a real consensus of the neighborhood that they are really behind the change. Limiting traffic to one-way in a neighborhood will have the effect of reducing some of the through traffic but it will have the negative effect of accessing your own neighborhood, not to mention emergency service limitations.

Staff's recommendation has always been to maintain West Hull Drive as it was laid out and approve through Planning Commission and City Council as a two-way road. The recommendation tonight from Emergency Services, Public Works and Engineering is that Hull Drive really should remain as it is right now. It does not mean that we can't continue to work on specifically the corridor plan type issues, which may give some relief to Hull Drive. We do not necessarily recommend the implementation of any of the proposals presented tonight immediately because of all the negative benefits from some of those things. Finally, if anything was to come out of this presentation and if the Committee was to recommend some sort of change, there is the issue of how to actually implement that change. We could do temporary type implementation where we use delineators (like the ones on Liberty by the Fire Station) to temporarily come up with some traffic control. The type of permanent improvements that you can visualize is in the magnitude of several thousands to \$25,000 and they are not identified improvements in the Capital Improvements Plan.

Mr. Moore asked what type of police enforcement problem does the Chief see in any of the proposals? Chief Black replied that anytime you are adding a change it would require more police staffing at those intersections and the department is short staffed as it is now. Mr. Moore asked if the Chief sees anything dangerous in the proposals that were presented and Chief Black replied that she would have to sit down and study the proposals.

Mr. Moore stated that before we go to public comment he would like to have placed in the record a letter that was received from Dr. Robert Green, 133 West Hull Drive, where he strongly disagrees with the first proposal which would block his driveway and prevent his patients from coming off of Rt. 23 to his facility. Mr. Moore also stated that Staff received a "Summary of Comments Made Before, During, and After the Wesleyan Woods Association Meeting of November 10, 2003" sent by Mr. Richard Huling, 322 Cottswold Drive. Mr. Berwanger commented that he received an e-mail from Mr. Fred Jones regarding the traffic problem on Cottswold Drive. Mr. Hanks stated that he received an e-mail from Mr. Bob Morgan, 191 Somerset Road, opposing making West Hull Drive a one-way street and an e-mail from Mr. and Mrs. John Tetz, 157 Somerset Road, opposing prohibiting westbound traffic to West Hull Drive from the shopping center. Mr. Ferrigno stated that staff received a petition from the residents of the Wesleyan Woods Association opposing the Hull Drive one-way proposal.

Public Comment –

Steve Ulery, 68 Cottswold Drive, stated that he has lived in Wesleyan Woods for seven years. He is one of a few people that have been asked by the Homeowners Association to represent the neighborhood this evening. We consider West Hull Drive as not being special. There are a lot of “cut through” streets throughout the City and since there are a lot of cut through streets, West Hull Drive is not special and should not be treated in a special way – it should have two-way traffic. There is also a timing factor. We on Cottswold and Somerset have been a “cut through” for many years and at one time both of these streets had 100% of the “cut through” traffic and at no time were our roads closed or made one-way. The residents of the development of West Hull Drive have been complaining about the cut through traffic since they purchased their homes. This development was developed after the construction of the shopping center. The 185 homeowners from the Wesleyan Woods Association voted no to limiting any traffic patterns on Hull Drive.

Mr. David Godsil (City Councilman), 172 Hull Court, thanked Staff for the hard work that they have put into this since this has been a problem for a number of years. Shifting traffic over to other roads is not an acceptable solution. He does not see how, with the very limited budget that the City has, that we are going to solve a very poor design. We need to live with it and not pit one neighborhood against another. Mr. Godsil stated that he does not want to see the Third Ward torn apart and we have to keep working on a transportation plan.

Mr. Reese James, 216 West Hull Drive, stated that the biggest concern that he has is the 44% of traffic on West Hull. What the people on West Hull are asking is not to overburden any other streets or neighborhoods with the cut through traffic but to find a way economically to distribute the traffic evenly. When the Ravines was first built, West Hull Drive was not even open to Liberty Road and it was told to a lot of the people that the road would not be open. Mr. James stated that he likes the third option since it looks like the most equitable.

Ms. Julie Osborne, 315 W. Hull Drive, stated that she is the Vice President and Trustee of the Homeowners Association on West Hull Drive. We have had a meeting on this and have discussed the three options. We have a fourth option that we would like to present which would be to close Hull Drive at Liberty coming from west to east (put up a barrier). As far as emergency vehicles – they can come down Sandusky Street to US 23 and into the neighborhood that way which would add less than 2 minutes of time from the Fire Station to our homes.

Dr. Bob Green, 327 Orchard Canyon (office at 133 W. Hull Drive), stated that the “us” vs. “them” mentality is not productive. We will not solve this problem with barriers or other things. The traffic issue does need to be dealt with. Whatever alternative the City comes up with he would like to be apart of since he had no clue that this was happening.

Mr. Dave Cline, 142 W. Hull Drive, stated that he owns the property that the City is talking about putting this up against (across the street from Dr. Green). He is against the plan and believes that speed bumps are what the neighborhood needs. Mr. Cline stated that he is willing to commit substantial sums of money toward having speed bumps put in – half of them (\$18-20,000) and will have a letter to the Committee outlining his issues.

Mr. Jay Wolfe, 100 Cottswold Drive, stated that he has been a resident of Cottswold Drive for 27 years and he sympathizes with the residents of Hull Drive. Living on Cottswold Drive he has seen his share of "cut through" traffic especially when the "Big Wheel" store was open many years ago. The only proposal that the Wesleyan Woods residents were given was Option A and if that proposal would be approved, the residents of Hull Drive would have to cut through Hawthorn or Cottswold Drive to get to their own house and we do not feel that is a very feasible option.

Ms. Kathy Pearson, 114 Dogwood, stated that her biggest concern is that if the traffic is diverted either with Options A or C, most people will come out of the Walmart Center making a right hand turn. It is not the right hand turn that concerns her but it is the people leaving Stratford Woods trying to make a left hand turn. If Hull Drive is closed down it will severely impact the Kroger Center.

Gary Chizmar, 156 Hawthorn Blvd., stated that he always thought Hawthorn was the busiest street. The police are understaffed and we need to hire more staff. The residents of Delaware are not getting the service that they deserve. Mr. Moore commented that if you read The Delaware Gazette you would see that the City of Delaware does not have the money to hire more police officers.

Mayor Windell Wheeler, 23 Penick Avenue, stated that his vehicle is one of those counts. We are not doing "cut through traffic", we are doing traffic distribution. Originally Hull Drive was to be a straight through road from Liberty Road to US 23 to Stratford Road. To help with the speeding problem the Engineering staff put in a Stop sign and a little curve in the road. When that street left Planning Commission to Council and from Council to Staff there was a red light designated at Hull Drive and US 23. In someone's wisdom, they negotiated a deal with the developer to eliminate that traffic light.

Ms. Maria Vonada, 300 Hull Drive, commented that what would cut down on a lot of traffic is having on the other side of town a Target so the people would be drawn out there (in the Westfield Center) and have an south access ramp at Pennsylvania & US 23. Mr. Moore responded that the access ramp is in the plans but we have no money.

Mr. Todd Vodicka, 273 Hawthorn Drive, stated that he is against the proposed changes.

Mr. Dick Huling, 322 Cottswold Drive, asked how is traffic to Kesselbrook Station going to affect everything that we have talked about here tonight? If West Cottswold is going to be extended across Rt. 23, what effect is that going to have?

Ms. Susan Wolfe, 100 Cottswold Drive, stated that she purchased her home knowing that Cottswold has traffic. We need to look at what is good for the entire community – not just one area. If you do this for Hull Drive – where does it stop?

Ms. Elaine Reese, 154 Ash, stated that we need to protect the upscale home areas. Is there any other residential development in Delaware where the City has allowed a billboard to direct traffic through a private subdivision (Stratford Woods)?

Committee Discussion - Mr. Hanks stated that he has heard quite a lot tonight and the decision is not easy. As the Mayor stated earlier, this is traffic distribution and it has to be done. This street was designed to keep the best interest in the mind of the community and at this time it is doing that.

Mr. Berwanger stated that the developers and realtors might be deceiving these people when they want to buy a home whether or not it may be a "cut through" street. We need to make sure that these folks are not misleading these potential homebuyers. It may help to have the speed trailer on Hull Drive on a more regular basis. Speed bumps were looked at by some of the residents on Hull Drive in the past and they did not like the ideal of the speed bumps. Mr. Cline commented that it was disposed of because no one wanted to fund the speed bumps. Mr. Berwanger stated that could be part of the answer to help slow people down. None of us has the answer and the road was designed to do what it is currently doing.

Mr. Moore stated that the issue of speed bumps was raised verbally again tonight and the City does have a speed bump written policy which describes how to get speed bumps installed. The cost of a speed bump is approximately \$6,800 and the City can't do it. We would be happy to assist the Hull Drive neighbors in the process if the neighborhood wants to pay for it. Mr. Moore asked Mr. Ferrigno what he thought of the ideal if we implemented Option C and moved the traffic light (just south of intersection on US 23) to the Hull Drive intersection? Mr. Ferrigno replied that to consider that you have to take Mr. Cline's property to build the intersection wide enough to handle all the traffic – there is a reason why it is where it is - the main entranceway of the shopping center. We have been looking at consolidating some of that traffic movement to the existing intersection and improving the number of lanes both on US 23 and the intersection so people would tend to want to use that intersection vs. some of the side roads. There is not a warrant right now for a signal at Hull Drive – it does not warrant one.

Mr. Moore stated that he does not believe there is any consensus tonight from the Committee to do any thing with any one of these three options or couple of the suggested options from the public tonight. He would like to recommend, as a Committee, that we turn all of these three options plus the ones mentioned by the public back to Engineering for further study and bring back at the January 20, 2003 meeting. Mr. Ferrigno commented that what was presented tonight was a proposal for one-way traffic movement on Hull Drive, is the consensus of the Committee not to consider one-way, maintain it two-way and look for alternate way to move traffic or explore other one-way options? You can reduce traffic on Hull Drive if you limit the accessibility of Hull Drive. It is his opinion that we are out of current options as far as reducing traffic on Hull Drive. Mr. Moore stated that all three of the options that were presented; he does not believe he heard any positive comments to do those. Mr. Ferrigno stated that Option D (from Julie Osborne) we did look at and excluded it upfront because we knew if we restricted eastbound traffic on West Hull Drive then Cottswold Drive would get all the traffic.

Mrs. Vonada suggested blocking off the Sears entrance (off of West Hull Drive). Mr. Ferrigno stated that was a granted public access to a business and it not so easy to cut it off.

Mrs. April Sanchez, Esq., stated that the more you impact a commercial property you are talking about takings and this City has no money as it is and the last thing the City has is the money to buy out Dr. Green's or Mr. Cline's property.

Mr. Moore stated that the City would not implement any of these suggestions unless we have another public meeting. Mr. Hanks stated that Staff has recommended leaving the street the way it is at the current time and he would recommend going forward with that. The only solution he could see for this area is the speed bumps being funded by the residents.

Motion: Mr. Berwanger moved to leave West Hull Drive as it currently is, seconded by Mr. Hanks and approved by an all aye vote. **MOTION APPROVED.**

Item 4: Other Business

Mr. Moore stated that there is a proposed resolution before this Committee tonight requiring permit parking at the Airport. We have a very restrictive parking area at the Airport (29 parking spaces) and we find quite often cars sitting at the Airport for 6-9 months. Mr. Moore stated that he is recommending that this Committee make a recommendation to City Council that a permit for parking in excess of 3 days be issued.

Motion: Mr. Berwanger moved to recommend to City Council that a permit for parking in excess of 3 days at the Delaware Municipal Airport be required, seconded by Mr. Hanks and approved by an all aye vote. **MOTION APPROVED.**

Mr. Browning passed out for the Committee's information a court case that Mr. Bennington, City Attorney, gave him regarding a juvenile that was cited for a stop sign violation, was found guilty and they appealed because the sign was 8 ¾" too low. The Court designated that it was installed improperly and reversed the decision.

Mr. Kaufman, Delaware Antique Mall, stated that on North Sandusky Street from William Street to Delaware Antique Mall there are no parking spaces. This has been a problem for his business so he is requesting a loading zone (with a 30 minute limit) on the very first parking space going north (after the hash marks). Ms. Mathews commented that Staff did receive a letter from Mr. Kaufman and will be looking at all the parking in the downtown area as a whole and this will be included. This item will come back to the Committee possibly at the January 2003 meeting.

Mr. Berwanger stated that he received a call from Larry Garrett, DDP, regarding some issues he has at his business at London and Noble Road. Also, the traffic signals between South Franklin and Liberty on West William - the timing on the traffic signals is not right. Mr. Browning responded that there was a malfunction last week but Staff will take a look at that corridor.

Item 5: Adjournment

Mr. Berwanger made a motion to adjourn the meeting at 9:20 p.m., seconded by Mr. Hanks and followed by an all aye vote. The next meeting of the Parking and Safety Committee is scheduled for January 20, 2003 at 7:00 p.m.

Robyn Moehring, Council Clerk