

MAKING HOWARD COUNTY MD NEIGHBORHOOD STREETS SAFER

The research supporting the facts cited below can be reached by clicking the [blue test](#).

COULD HOWARD COUNTY NEIGHBORHOOD STREETS BE SAFER?

1. Is there a valid cause for concern about the safety of neighborhood streets? Table 1, below, shows that yes, this concern is valid. Table 1, from a report entitled [Comprehensive Engineering Approach to Achieving Safe Neighborhoods](#), shows that of all roadway classifications, local streets have the highest crash (aka collision) rate.

TABLE 1 Comparison of crash rates by roadway classification in urban areas (1)

Roadway Classification	Fatal Crashes	Vehicle-Miles Traveled (millions)	Crash Rate (crashes per 100 million vehicle-miles)
Interstate	1,791	285,325	0.6
Other Freeway	1,619	128,242	1.3
Minor Arterial	5,081	338,987	1.5
Major Collector	3,171	240,402	1.3
Collector	1,149	107,272	1.1
Local Roads/Streets	2,928	188,365	1.6
Unknown	27	--	--
Total	15,766	1,288,593	1.2

2. Are the higher collision rates true for Howard County neighborhood streets as well? Table 2, provides a comparison of pedestrian and bicycle collision rates on the different classifications of Howard County roads based upon 2013-2017 data provided by the Howard

Table 2: Pedestrian-Bicycle Collisions in Howard County by Road Classification

Functional Road Classification	Pedestrian-Bicycle Collisions	Percent
Principal Arterial	7	2%
Intermediate Arterial	86	19%
Major Collector	91	20%
Minor Arterial	91	20%
Minor Collector	25	6%
Local Streets:		
Residential (Neighborhood)	101	22%
Commercial-Institutional	50	11%
TOTAL	451	

Based on Howard County Police Collision Data for 2013 to September 2017

County Police Department¹. Note that local residential (neighborhood) streets had the highest number of pedestrian-bicycle collisions. See the [Howard County pedestrian-bicycle collisions map](#).

3. Why do neighborhood streets have the highest collision rate of all road types? In a report entitled [Comprehensive Engineering Approach to Achieving Safe Neighborhoods](#), the authors framed an answer to this question as well as reasons why neighborhood streets become unsafe:

“Steady increases in travel demand coupled with minimal increases in arterial street capacity have led to an increase in traffic-related safety problems in residential neighborhoods. These problems stem from the significant number of motorists that divert from the arterial to the residential street system in an effort to avoid arterial-related delays. Diverted motorists add to neighborhood traffic volumes and increase crash exposure for pedestrians, bicyclists, and other vehicles. In addition, diverted motorists often drive at excessive speed which increases both the potential for a crash and its severity.”

4. The increased speed associated with cut-through traffic causes the severity of injury to rise when a pedestrian is struck. A [pedestrian is six times](#) more likely to die if struck by a vehicle traveling at 30 mph vs. 20 mph. Children between the ages of [5 and 9](#) are particularly at risk to traffic-caused injury.
5. So, yes, our neighborhood streets could be safer given the fact that both data sets show that residential streets have the highest number of collisions and that the higher speed of cut-through traffic increases injury severity.

HOW CAN WE MAKE OUR NEIGHBORHOOD STREETS SAFER?

6. As main roads become increasingly congested, drivers seek bypass routes. Neighborhood streets are all too frequently the bypass route of choice. It is this pattern which accounts for excessive neighborhood cut-through traffic.
 - a. [Research](#) shows that cut-through traffic becomes significant when congestion causes the average speed on main roads to drop to half of the posted speed limit.
 - b. This point is equal to the C to D threshold on the [level of service scale](#) which ranges from “A” (free flow) to “F” (grid lock).
7. [Up to 30%](#) of main road traffic will cut-through neighborhoods to avoid congestion. Various traffic management techniques have proven effective in discouraging cut-through traffic as well as slowing speed, both of which reduces collisions on neighborhood streets. Table 3, on the next page, shows the effect of twelve management techniques on traffic volume, speed and collisions. The authors of the report in which the table appeared noted that route modification and calming devices have the most lasting benefits. Increased

¹ The original data provided by Jeanne Upchurch, Records Section Manager, Howard County Police Department, can be viewed at: ceds.org/lyhus/CopyOfKleinMotorVehicleCollisions2013Sep2017.xlsx. This classification of each road where pedestrian collisions occurred was determined using the [Howard County Functional Road Classification Map](#). These data were then converted into another Excel file to generate the collision data table above. This file is posted at: <http://ceds.org/lyhus/HowardCountyPoliceCrashData.xlsx>

enforcement is much more expensive and, like speed trailers-signs, the benefit diminishes with time.

Table 3. Effectiveness of selected neighborhood traffic management techniques

This table appeared as Table 5 in Comprehensive Engineering Approach to Achieving Safe Neighborhoods

Category	Technique	Primary Measure of Effectiveness	Percent Reduction In...		
			Volume	Speed	Collisions
Route Modification Devices	Full closures (1 to 4 blocks away)	Volume reduction	44		
	Half closures (1 to 4 blocks away)	Volume reduction	42	19	
	Diagonal diverters	Volume reduction	35	4	
Traffic Calming Devices	Speed humps	Speed reduction	18 to 22	22 to 23	13 to 40
	Speed tables	Speed reduction	12	18	45
	Raised intersections	Speed reduction		1	
	Traffic circles	Speed reduction	5	11	28
	Roadway narrowing	Volume reduction	10	4	
	Chokers	Volume reduction	20	14	
Regulatory Measures	Speed trailers	Speed reduction	9	7	10
	Speed limit signs and markings	Speed reduction	4	7	3
	Increased enforcement	Speed reduction	8	28	28

8. While Howard County discourages calming devices, other Maryland counties have used them to good effect:
 - a. [Harford County](#) has been making extensive use of speed humps and other measures to reduce cut-through traffic and speed on neighborhood streets. Research conducted by the Harford County DPW Traffic & Transportation Engineering Division shows that these measures reduced speed on neighborhood streets by up to 30% and a traffic volume reduction of as much as 57%.
 - b. [Frederick County](#) has also been using speed humps to reduce speed and cut-through traffic on neighborhood streets.
 - c. [Prince George’s County](#) has found that: “Based on our experience, we believe speed humps are the best physical measure in addressing speeding and cut-through traffic.”

9. Howard County officials expressed two concerns with regard to speed humps and other calming measures:
 - a. The first concern is that humps make snow-plowing more difficult. [Frederick County](#) uses a modified speed hump design. Frederick County officials wrote: “We use a [Watts style hump](#)... We find that these are effective at controlling speeds and are snowplowable.”
 - b. The second concern is that speed humps cause delay in emergency services vehicle response time. Table 4, on the next page, shows the emergency vehicle delay effect of various calming measures. Note that some designs cause considerably less delay.² Additionally, the public safety benefits of a more rapid response time must be

² Table 4, is from [Comprehensive Engineering Approach to Achieving Safe Neighborhoods](#)

contrasted with the reduction in injuries and fatalities achieved on neighborhood streets with calming measures.

TABLE 4 Emergency vehicle delays due to selected traffic calming devices

Traffic Calming Device	Delay to Listed Emergency Vehicles (seconds) ¹			
	Fire Engine	Custom Rescue Vehicle	Ladder Truck	Ambulance with patient
12-ft speed hump	5.1	--	5.0	9.7
14-ft speed hump	5.2	2.9	6.6	--
22-ft speed table	3.0	0.3	8.3	--
16 to 25-ft traffic circle	6.2	3.1	6.9	--

Notes:

1- Based on data reported in Table 7.3 of Reference 9.

WE MUST NOT TURN CUL-DE-SACS INTO CUT-THROUGH STREETS

10. Approximately a third to half of the 3500+ streets in Howard County are cul-de-sacs (courts, stub roads, or other dead-end streets) where cut-through traffic is not possible.
11. A [review of residential development projects approved by Howard County over three years](#) showed that a third involved extending cul-de-sac (dead end) streets. Of these projects, 5% resulted in converting a cul-de-sac to a through street, which can cause a large increase in volume and speed, particularly if the new through-street serves a way to bypass main road congestion.
12. The conversion to through-streets usually occur when a development project connects to an existing cul-de-sac. This is done to create a second means of access. The Howard County [Design Manual Volume III](#) (p. 2-10) only calls for a second means of access when more than 100 homes are proposed. Yet cul-de-sac streets are being turned into through-roads when far fewer new homes are involved. For example, the Lyhus Property shown on the next page consists of only 29 proposed homes, yet a second access is being required via a connection to Fulton Estates Court.
13. The public safety benefits of a second means of access must be balanced with the increase in collisions that come with converting a cul-de-sac into a through street. The following modifications to current County policy would satisfy emergency access needs without jeopardizing the safety of neighborhood streets:
 - a. Only require an extension of a cul-de-sac when it is absolutely necessary for public safety,
 - b. Do not require an extension when less than 100 homes are proposed, and
 - c. If an extension would create the possibility of cut-through traffic then require:

Fulton Estates Court is presently a quiet, cul-de-sac street



If built, the connector road would allow MD216 traffic to cut-through Fulton Estates Court to Lime Kiln Road

- i. To prevent cut-through traffic install an Emergency Access Only gate across the extension. The gate can only be opened by police, fire, ambulance or other emergency services personnel, or
- ii. Use traffic calming or other measures that discourage cut-thru traffic, reduce vehicle speed and thereby reduce collision frequency-severity



As shown above, other Maryland counties make extensive use of traffic calming measures. Emergency Access Only gates have been used by: [Baltimore County](#), [Bel Air](#), [Charles County](#), and [Saint Mary's County](#).

14. Another reason given for converting cul-de-sacs into through streets is to increase neighborhood interaction. The reason was stated as:

“There are conflicting points of view – to interconnect streets, which makes sense from a neighborhood continuity perspective by allowing neighbors to visit neighbors without having to drive through disconnected neighborhoods of isolated cul-de-sacs, or encourage and endorse isolated cul-de-sac neighborhoods.”

15. A search for studies supporting the position quoted above indicates that it may no longer be valid. The following documents show that converting a cul-de-sac into a through-street tends to decrease neighbor interaction:

- a. In a paper entitled [*The Cul-de-sac Effect: Relationship between Street Design and Residential Social Cohesion*](#), published in the Journal of Urban Planning and Development, Volume 141 Issue 1 - March 2015, sociologist Thomas R. Hochschild Jr., reported: “This study utilized a quasi-experimental design to assess differences in residential social cohesion for residents of “bulb” cul-de-sacs, “dead-end” cul-de-sacs, and through streets. My data reveal that bulb residents experience the highest levels of attitudinal and behavioral cohesion, followed by dead-ends, then through streets.”
- b. [5 Benefits of Cul-De-Sacs](#): “Promotes friendships and neighborly interaction: This hanging out potential also applies to whole families: parents, kids and other relatives and friends. As the cul-de-sac emphasizes the closeness of the houses within and the visibility of homes and families. In this way, the families are naturally encouraged to connect as well. Smiling and waving, checking in, connecting and even joining in games, parties and other social events naturally rise up in this design.”
- c. [Reconsidering the Cul-De-Sac](#): “Residents also preferred the cul-de-sac as a place to live, even if they actually lived on a through or loop street. People said they felt cul-de-sac streets were safer and quieter because there was no through traffic and what traffic there was moved slowly. They also felt they were more likely to know their neighbors. One resident’s comment was typical: “Our pets and kids are safer when there is a no-outlet street; you feel kidnapping is less likely—there is more of a sense of neighborhood.” Thus, the study generally corroborated earlier transportation research on the values of a hierarchical discontinuous street pattern. It also

supported claims that cul-de-sacs are more frequently and more safely used by children.”

- d. [The Benefits of Living in A Cul-De-Sac](#): “Because cul-de-sacs tend to have fewer homes than traditional streets, it is easier for people to get to know their neighbors in the cul-de-sac. Cul-de-sacs also are a natural place for neighbors to plan block parties or picnics because with proper permits from the local authorities, a cul-de-sac can be blocked off to any incoming or outgoing traffic during the block party. Homes in a cul-de-sac generally face outward toward the other homes, creating a greater sense of community for the residents as they can see their neighbors’ front doors from their own.”
 - e. [Residential Street Design and Play: A literature review of policy, guidance and research on residential street design and its influence on children’s independent outdoor activity](#): “Both traffic speed and volume have been found to have an effect on how streets are used. Appleyard’s study of three similar streets in San Francisco showed that residents’ quality of life was measurably affected by the volume of traffic in the street (Appleyard, 1981). Those living on a light-trafficked street knew more of their neighbors, felt a greater sense of belonging and were more familiar with its physical features. The study was replicated on residential streets in Bristol in 2011 and the findings resonated strongly with Appleyard’s (Hart & Parkhurst, 2011).”
16. 27 counties or cities have adopted [Vision Zero](#) plans which layout a strategy for bringing an end to traffic-related fatalities and severe injuries within ten to twenty years. Included among these localities are [Montgomery County, MD](#), [Alexandria, VA](#) and [Washington, D.C.](#) Vision Zero plans seek to achieve safer streets by:
- a. Lowering speed limits,
 - b. Redesigning streets,
 - c. Implementing meaningful behavior change campaigns, and
 - d. Enhancing data-driven traffic enforcement.
- Howard County, MD should adopt a Vision Zero plan.

KEY POINTS: MAKING HOWARD COUNTY NEIGHBORHOOD STREETS SAFER

- A. Neighborhood streets exhibit the highest rate of collisions of all Howard County roads.
- B. Since 2013, 101 pedestrian and bicycle collisions occurred on Howard County neighborhood streets.
- C. Cut-through traffic prompted by main road congestion is a significant factor in these collisions due to the increased volume and speed of drivers in a hurry.
- D. The increased volume-speed of cut-through traffic causes a higher collision frequency as well as more severe pedestrian injury for those residing on neighborhood cut-through streets.
- E. Reducing main road congestion is key to minimizing neighborhood cut-through traffic volume.
- F. Traffic calming measures have reduced neighborhood cut-through traffic by 30% to 57%, speed by 20% to 30%, and collisions by 13% to 45%.
- G. Greater use of traffic calming measures must be made on Howard County neighborhood streets.

- H. Cul-de-sacs should only be converted into through-streets when the public safety benefits clearly outweigh the likelihood of increased pedestrian collisions. Even then, alternatives such as emergency-access-only gates and traffic calming measures should be used, as other counties have, to achieve the benefits without undue risk of increased pedestrian injuries-fatalities.
- I. Howard County, MD should adopt a Vision Zero plan to end traffic-related fatalities and severe injuries within the next ten- to twenty-years.

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