



**MONTGOMERY COUNTY PLANNING DEPARTMENT**  
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

MCPB  
ITEM NO. 14A  
9-18-08

September 11, 2008

**MEMORANDUM**

**TO:** Montgomery County Planning Board

**VIA:** Dan Hardy, Acting Chief *DKH*  
Transportation Planning Division

**FROM:** Larry Cole: 301-495-4528, for Transportation Planning Division and *LC*  
Karen Kumm: 301-495-4554, for Urban Design Division *KKM*

**SUBJECT:** MCER NO. 31-08: PROPOSED DEPARTMENT OF TRANSPORTATION  
REGULATION, Context Sensitive Road Design Standards

**APPLICANT:** Montgomery County Executive

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**RECOMMENDATION:** We recommend that the Planning Board adopt the following comments to the Executive on the proposed regulations:

The purpose of the County Council's 2007 Road Code was that each transportation facility in the County should be planned and designed to:

- maximize the choice, safety, convenience, and mobility of all users,
- respect and maintain the particular character of the community where it is located, and
- minimize stormwater runoff and otherwise preserve the natural environment.

We believe that our environmental goals would be met by the proposed standards, but that changes are needed to meet the intent of context sensitive street design embodied in the first two points:

- The proposed target speeds are too high to create a safe environment for all users while creating streets that support and encourage pedestrian activity and achieving the community character called for in our Master Plans.
- The proposed travel lane widths in our Urban areas are too wide to achieve these goals.
- Clear guidance is needed as to when on-road bike accommodation should be provided beyond what is required in a Master Plan.

While we believe that the proposed target speeds and urban travel lane widths are too high, we also believe that the proposed standard constitute a great improvement in formalizing the decision-making process for the design of our roads.

We offer the following detailed comments for your consideration:

### **Speed-Related Issues**

1. A reference to the statutory default speeds and allowable alterations under MD Vehicle Law should be included in the Target Speed standard.
2. The proposed Introduction and Application Standard should be provided as an internal design policy of the Department of Transportation rather than as a regulation. It should include a discussion of how the default statutory speeds in MD Vehicle Law and how the allowable alterations should be applied in the design of the County's roads. It should also include a process for documenting variances from the standards.
3. Many of the recommended target speeds in the proposed Target and Design Speed Standard are in excess of what is appropriate for the roadway classifications and adjacent development, exceeding current posted speeds and the statutory default speeds in MD Vehicle Law. The standard should include a requirement of a written waiver for any target speed that exceeds the default statutory speed. In general, the target speeds should be closer to those shown in the 2007 Road Code bill. Our recommendation for a revised target speed table is shown as Attachment 1.
4. Four-lane undivided roads should have a maximum target speed of 40 mph.
5. Closed-section roads with target speeds over 40 mph should not be required to have a clear zone greater than ten feet wide. AASHTO's clear zone requirements for open-section roads should not be used for closed-section roads because they would adversely affect the placement of street trees and the streetscape envisioned in the County's Master Plans.
6. For driver safety, the use of standard 6" curbs should be restricted to roads with target speeds of 40 mph and less. Open-section standards should be used for roads with target speeds of 45 mph and above; but where closed-section roads are necessary, lower, safer 4" curbs, as recommended by AASHTO for higher speed situations, should be used.

7. The Introduction and Application should include a requirement to consider the installation of guardrail to protect pedestrians and off-road bicyclists where sidewalks and/or shared use paths are within the clear zone of roads with a target speed of 45 mph or greater.

### **Tree Placement Standard**

8. Target speeds must complement master plan streetscape recommendations. The proposed Tree Placement Standard should accommodate street trees between the curb and sidewalk and in roadway median as one of the basic elements of roadway design prior to selection of the target speed. To accomplish this objective, the County Council should adopt target speeds for master planned roadways in future master plan amendments.
9. Street trees should be shown between the curb and sidewalk on the cross section standards for all classifications except rural roadways and Controlled Major Highways. Sufficient right-of-way should be provided in the proposed cross section standards to accommodate street trees between the curb and sidewalk and in the median while accommodating the recommended clear zone requirements.
10. Roadway medians should be wide enough to maintain a continuous line of street trees. Eight feet should be considered the minimum median width for the planting of street trees

### **Stormwater Standard**

11. We support the proposed Stormwater Standard. The proposed monitoring program will help ensure that our stormwater management goals will be accomplished in a manner that promotes the health of street trees.

### **Cross Section Standards**

12. The proposed values for urban areas would create roadways that are too wide and would not achieve the traffic-calming goals of the Road Code bill. We recommend adoption of the revised cross section table shown in Attachment 2 that reflects the values in the bill's uncodified table and better matches the types of urban streets envisioned in master plans.
13. The existing cross sections should not be retained in the book of standards if we are to achieve the benefits of the Road Code revision. A policy should instead be developed that addresses retrofitting existing streets to new standards, especially within urban areas, allowing for a careful consideration of improvements and achieving a custom fit into the existing context.

If the existing cross-sections are retained on a temporary basis for further evaluation purposes, a date certain for their expiration should be included with the proposed regulation; that date should be no longer than six months from the approval of the regulations.

14. The non-cross-section standards that are proposed to be retained should be revised to ensure that they meet the latest requirements, practice, the proposed new cross-section standards, and Fire and Rescue Service regulations.
15. The proposed table of cross section elements needs graphics to reach the level of detail of our existing roadway standards. Final cross sections with graphics should be produced and submitted to the Council for approval.
16. Public Improvement Easements should not be eliminated from the County's cross section standards without an analysis of the potential impacts on the developability of adjacent property as well as for the need for changes to the Zoning Ordinance.
17. A standard should be created setting forth the application requirements for on-road bike accommodation for Major Highways, Arterials, and Minor Arterials.
18. Sidewalks on Arterials and Major Highways in urban and suburban areas should be six feet wide minimum per AASHTO recommendations.
19. Shared-use paths should be shown as an option in the cross sections for all Major Highways, Arterials, Minor Arterials, Primaries, and Business District Streets to accommodate Master Plan recommendations.
20. Additional cross section standards are needed for:
  - a. two-lane Major Highways in the suburban and rural areas,
  - b. four-lane Major Highways in the urban and suburban areas, and
  - c. two-lane Arterials in all areas
  - d. Business District Streets with on-road bike lanes.
  - e. three new cross section standards are needed to replace existing standards for divided residential boulevards.
  - f. two new cross section standards are needed for two transitway design to achieve better pedestrian accommodation than current standards.
21. Intersection design standards are needed to ensure safe pedestrian accommodation within urban areas and should depict curb radii, extended curbs, median and pedestrian refuge widths and pedestrian crosswalks.

### **Applicability**

22. The proposed standards should apply to projects that are in Phase II of Facility Planning since they are major projects that are still in the preliminary design stage.

In addition, we would like to discuss with your staff the possibility of specifying target speeds and cross section standards in Master Plans to minimize uncertainty in the implementation of our transportation network.

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## INTRODUCTION AND NEXT STEPS

In accordance with last year's Road Code bill, the County Executive published new road standards on September 1, 2008 as proposed regulations for adoption under the Method 2 process, which requires that they be submitted to the County Council for review. Thirty days will be allowed for public comment and this Planning Board discussion is intended to give you the opportunity to provide comments during this period. After making any revisions in response to comments received, the Executive will submit the regulations to the Council by October 15, 2008. If not approved or disapproved within 60 days of receipt, the regulations are automatically approved. (The proposed regulations may be found at <http://montgomerycountymd.gov/content/DPWT/capital/DCD/htm/DOTDOTERoadCodeSept2008.pdf>) If the proposed standards are disapproved, the table of roadway design elements in last year's bill (see Attachment 3) will become effective.

A workgroup with members from public agencies, interest groups, and individual citizens was created to provide input and comments in the preparation of the proposed standards. The Executive's technical consultants and facilitator led the stakeholder's workgroup (SWG) through discussions about the various aspects of road design to assist in that effort. The Executive Branch has been revising and compiling its proposed regulations since the workgroup finished its work at the end of July. We are recommending that the Board make its comments on these regulations to the Executive at this time so that they can be considered in the preparation of the final regulations proposed to the County Council.

The proposed regulations submitted to the Council may vary from what you review on September 18<sup>th</sup> in response to the comments received, and there are other comments that are more appropriately directed to the Council rather than to the Executive. ***We therefore anticipate bringing the final regulations back for your review so that you may provide comments to the Council for their consideration.*** This would occur about the end of October.

## ANALYSIS SUMMARY

This is the first time the County's Road Code has been completely revised in decades and it is likely that it will not be redone for decades more. The proposed standards will set the path for the County's road construction for quite some time and given that roads provide the basic framework of how we move around the county, and they influence how we perceive the county, it is critically important that we get this right.

In an effort to improve safety for non-motorized travelers, the County has undertaken traffic-calming improvements, Safe Routes to Schools improvements, bus stop safety improvements, and instituted the use of speed cameras. What we have not done is change the basic design of our roadways. Correcting that problem was the Council's intent in requiring the Executive to submit new road standards - to change the design of our roads to make them more pedestrian-friendly. Realistic, attainable environmental targets would be codified by the proposed regulations and would be a clear improvement, but the benefit for bicyclists, and particularly for pedestrians, is less clear.

The bike lanes shown in the cross sections are wider than what was in the bill in some cases, but the higher target speeds for motorized vehicles would negate at least part of the benefit of that additional accommodation. No guidance is provided as to when bike lanes or wider shared lanes should be constructed. Wider bike lanes and more numerous bike lanes mean a longer exposure time for pedestrians crossing the roadway.

The proposed higher target speeds contravene the intent of the bill and create a far less safe environment for pedestrians than what was intended, particularly in urban areas where we expect the most pedestrian activity. The higher speeds, in conjunction with the proposed tree placement criteria, would also diminish the streetscapes of our major roadways by eliminating or diminishing the presence of trees in the right-of-way. The travel lanes, parking lanes, center turn lanes, and medians in Urban areas are wider than they should be, which increase the pedestrian crossing distance and encourage higher speeds.

This summary directly addresses the individual standards that are proposed as regulations. Many of the issues affect more than one standard number however and are discussed in greater detail in a different format following the summary.

**Introduction and Application Standard No. 010.01:** The intent of this document is to provide a discussion of the purpose of the Road Code changes and guide the application of the standards. While we agree that a design guide is needed, we disagree that it should be approved as a regulation. Some of the information in the proposed standard duplicates or approximates text in the Road Code itself, such as the roadway classification definitions and the description of urban, suburban, and rural areas, which could be potentially problematic when there are conflicts between the two. There are also conflicts between the general width of road elements shown in this standard and those shown in the individual cross-section standards. The adopted standards will become part of the Road Code, but what is essentially a users' guide and summary should not itself be part of the Code.

One important part of the design process that is only briefly discussed in this document is the "Exceptions to Standards". Poorly documented and sometimes unwarranted variances from standards have been a problem in the past. It is imperative as we begin with a new Road Code and standards that we adhere to what has been approved.

***A revised version of the proposed Introduction and Application standard should be provided as an internal design policy of the Department of Transportation rather than as a regulation. It should include a discussion of the default statutory speeds in MD Vehicle Law and the allowable variances from those default speeds, and a process for documenting variances from the standards.***

**Target and Design Speed Standard No. 020.01:** Target Speed in the Road Code is defined as *"the speed at which vehicles should operate on a thoroughfare in a specific context, consistent with the level of multimodal activity generated by adjacent land uses, to provide mobility for motor vehicles and a safe environment for pedestrians and bicyclists. The target speed is usually the posted speed limit."* Design Speed is in the proposed standard as *"the selected speed used to define various geometric features of the roadway."* Both target and design speed would be incorporated in the standards for the first time.

The design speed would be set at the target/posted speed, which would be an improvement over the current practice of setting design speeds 5-10 mph over the anticipated posted speed. While the intent of that practice was to provide a safety buffer for drivers, it has not worked as anticipated since drivers operate at the speed they feel comfortable, even if it endangers other users of the roadway, including pedestrians and bicyclists.

The proposed target speeds are higher however, sometimes much higher than the Council has previously voted to support, and reflect the Executive staff's stronger focus on motor vehicle mobility. Even the low end of the proposed target speed range for some roads in the urban areas (30-40 mph for Major Highways) exceeds the value included in the uncodified table (25 mph), for example. The proposed target speeds are disconnected from the legal foundation for posting speeds - Maryland Vehicle Law, which is already context-sensitive, setting statutory default speeds for roadways according to the level and type of adjacent development – and are higher than what is currently posted on many roads throughout the county. While target speeds that are higher than the default speed may be justified on an individual basis, they should not be included in the normal range of values.

The effect of this standard would be to encourage an increase in speeds when a decrease is what was intended by the bill.

***The proposed Target and Design Speed standard should be revised to reduce target speeds to be closer to those shown in the 2007 Road Code bill. Our recommendations are shown in Attachment 1. The standard should include a requirement for a written waiver for any target speed that exceeds the default State statutory speed.***

**Tree Placement Standard No. 030.01:** Street trees are an important framing element of the roadway and provide a physical and psychological buffer between the roadway and sidewalks, shared use paths, and adjacent development. This standard is intended to ensure that safety is maintained for drivers on the roadway. The traffic-calming effect of trees on the roadway and other beneficial qualities are treated as ancillary, less necessary benefits.

The Executive's proposed Tree Placement standard makes no mention of Master Plan streetscape recommendations and would permit the Department of Transportation to determine where and whether streets will get trees.

***The proposed Tree Placement Standard No. 020.01 should be consistent with the streetscape guidelines in Master Plans as one of the basic elements of roadway design prior to selection of the target speed. Target speeds that prohibit master plan streetscape recommendations should not be used.***

**Stormwater Standard No. 040.00:** The environmental goals of the Road Code bill would be met by reducing impervious surfaces and by infiltrating stormwater runoff on-site, rather than sending it to a regional stormwater management pond. The benefits of this approach are that groundwater is recharged as close to the source as possible, runoff is slowed in its travel to streams, and smaller regional facilities are required. Since the construction of stormwater management ponds often requires the removal of trees, minimizing the footprint of these facilities would have other environmental benefits.

The numbers in the Road Code bill – 1” infiltration for urban areas, 2” for suburban, and 3” for rural - were introduced late in the process in 2007 and received far less discussion prior to their adoption than did the target speeds and the width of roadway elements. The technical consultant had several meetings with the Stormwater Partners advocacy group, our staff, and Executive staff to reach a practical solution. We believe that the proposed goals of infiltrating of stormwater runoff on-site – 25% for closed-section roads and 60% for open-section roads - are achievable and acceptable. These goals are to be assessed after three years to determine if they should be changed based on our experience.

One of the important remaining issues is how to ensure the viability of street trees while achieving our stormwater management goals. Many of the infiltration methods noted in the Stormwater standard build on the experience of other jurisdictions. But stormwater infiltration is a very site-specific issue affected by rainfall patterns, soil types, and adjacent development. The tolerance of nearby trees and other vegetation to roadway salt and other pollutants carried by the runoff also needs further study. MCDOT would perform pilot studies to gain information on these issues.

*We support the proposed Stormwater standard.*

**Proposed Cross Sections/Design Standards (Standard Nos. 2001.01 through 2008.12):** These cross sections are shown in a tabular format in the proposed regulations. They are intended to replace the table of design elements in the uncodified section of the Code, which will become effective if the former are not approved by the County Council.

A major goal of the Road Code revision was to make roads smaller, which in addition to the environmental benefits, would reduce excessive speeds and make our roads more friendly to pedestrians and bicyclists. We are generally in agreement with the proposed cross sections for the suburban and rural areas, which would accomplish those goals.

We are not in agreement with the standards for urban areas. We believe that roadways should be as small as possible in urban areas so that slow travel speeds are encouraged, making it safe for pedestrian and bicyclists and for drivers pulling into and out of on-street parking spaces, dropping off passengers, etc. Rather than use our successful experiences with constrained rights-of-way, the proposed standards would create urban roads with travel lane, parking lane, and median widths in excess of what was in the uncodified table.

*We do not support the proposed cross sections for urban areas, but instead recommend adoption of the revised table shown in Attachment 2 that reflects the values in the Road Code bill’s uncodified table and better matches the types of urban streets envisioned in master plans.* Illustrations of our recommended urban cross sections are shown in Attachment 4.

*We generally support the proposed cross sections for the suburban and rural areas.*

**Existing Cross Sections/Design Standards (Standard Nos. MC-100.01 through MC-811.01):** The existing cross sections, which were last updated in 1996, are being submitted for Council approval. While the Code requires that these standards be submitted prior to their use, this has not been done for many years. When the SWG was set up, the new standards were intended to replace the existing standards so that the goals of the Road Code update could be achieved. At

some point in the process, Executive staff proposed keeping the current standards in some form for applications where a street was already mostly built to the same standard. The Executive now proposes to keep all the old standards and adopt the new ones (Introduction and Application Standard 010.01, page 17, Sec. 6.2). This would make it difficult to achieve the intent of the Road Code bill, which was to change the way we build roads to make them more friendly to pedestrians, bicyclists, and the environment.

The proposed Introduction and Application Standard notes that both the proposed and the existing standards are available for use “until such time as the previous MCDOT-maintained standards are reviewed for applicability and either retained or eliminated.” While the review of these standards could have been accomplished at the same time as the preparation of the new standards, we believe that any temporary retention of the existing cross-sections should last no longer than six months from the approval of the regulation. As recommended elsewhere in this memo, guidelines are needed to address retrofitting streets and rights-of-way to the new standards.

Many of the non-cross-section standards that are proposed to be retained need to be revised to make a coherent package, including:

- Existing cul-de-sacs and turnaround standards need to be revised to meet the proposed Fire and Rescue Service Executive Regulations that the Board is reviewing concurrently with the subject regulations to accommodate larger emergency vehicles.
- Existing curb ramp standards need to be revised to meet ADA requirements in regard to ramp slope and a detectable surface at the bottom of the ramp.
- Existing driveway standards and/or landscape panel widths shown on cross section standards need to be revised to meet ADA Best Practices to ensure that a level path is provided for handicapped persons.
- The existing tree variety and species list do not reflect the trees currently permitted by MCDOT. These lists also need to be revised to include and clearly state which salt-tolerant species can be used in areas where stormwater is being infiltrated per the proposed Stormwater Standard No. 040.00.
- The following traffic-calming standards have been used by the Department of Permitting Services since 2003 and should be included in the proposed regulations submitted to the Council: Intersection Chokers, Mid-Block Chokers, Median/Pedestrian Refuge Island, Raised Crosswalk, Speed Hump-Watts Profile, Speed Hump – Flat Top Profile, and Residential Traffic Circle.

To address the above comments, we recommend that following:

***The cross section standards should not be retained in the book of standards if we are to achieve the benefits of the Road Code revision. A policy should instead be developed that addresses retrofitting existing streets to new standards, especially within urban areas, allowing for a careful consideration of improvements and achieving a custom fit into the existing context.***

*The non-cross-section standards that are proposed to be retained should be revised to ensure that they meet the latest requirements, practice, the proposed new cross-section standards, and Fire and Rescue Service regulations.*

*If the existing cross-sections are proposed to be retained on a temporary basis, a date certain for their expiration should be included with the proposed regulation; that date should be no longer than six months from the approval of the regulation.*

## **DETAILED ANALYSIS**

### **Presentation of the Proposed Standards**

The cross section standards are presented in a tabular format that contains all possible roadway design elements, with dimensions shown only for those elements that are included in a particular standard. The proposed table with the titles for each standard, and with our recommendations for changes, is shown as Attachment 2.

The existing standards are fully developed with details such as the presence or absence of curbs defined, and the slopes of pavement, shoulders, ditches, etc. The newer existing cross sections also show street trees. We recommend that final proposed standards be developed with graphics showing the location of street trees on all cross sections. Street trees are a basic element of the roadway and a definite location should be shown, not only to establish where the tree goes, but to ensure that a safe and comfortable buffer remains for pedestrians between the sidewalk and the roadway.

*We recommend that street trees be shown on all cross section standards where applicable. Where alternative locations for street trees are needed, they should be depicted on the standard or a separate standard should be produced.*

*Final cross sections with graphics should be produced and submitted to the Council for approval.*

**Easements and Impacts on Development:** The items discussed above are physical elements of the cross section standard, but easement areas also affect the developability of adjacent land. Notes are shown on some of the proposed cross sections stating, “New Standard ROW needed to avoid sidewalk placement in a PIE.” (Proposed Standard Nos. 2001.03 and 2002.04) Public Improvement Easements (PIE’s) have been shown since 1996 on open-section roadways with sidewalks, with the sidewalks partially or completely in the easement area on private property so as not to adversely affect the setback of buildings from the right-of-way line. (Existing Standard Nos. MC-210.05, MC-211.03, MC-212.04, and MC-212.05)

Eliminating the use of PIE’s would require wider public ROW’s. The widest ROW for our current Tertiary Residential Road standard is 50 feet; the ROW in the proposed Tertiary standards is up to 74 feet wide. Since the setback of buildings is governed by the Zoning Ordinance and measured from the ROW line, the homes on either side of the road in this case would change from being 100 feet apart to 124 feet apart, giving a different character to the neighborhood. The number of potential lots created by subdivision might also be reduced to meet minimum lot size and setback requirements. We believe that a detailed analysis of the effects of

this provision, including possible changes to the Zoning Ordinance, must be made before doing away with the use of PIE's.

Ten-foot-wide Public Utility Easement (PUE's) have also been required at the back of the right-of-way line for the undergrounding of utilities. These easements are important elements that need to be shown in the final cross section standards.

***Public Improvement Easements should not be eliminated from the County's cross section standards without an analysis of the potential impacts.***

***Standard required easements should be shown on all cross section standards where applicable.***

**Applicability of the Proposed Standards:** The proposed standards would apply to all new capital projects not shown in the current CIP and those still in Facility Planning Phase I. Other projects would be exempt. ***We recommend that the proposed standards also apply to projects that are in Phase II of Facility Planning*** since they are major projects that are still in the preliminary design stage.

The proposed standards would apply to all private development projects that have not received Preliminary Plan approval prior to the adoption of the Executive Regulations.

**Rural, Suburban, and Urban Areas:** Attachment 5 shows the map of the County's Rural, Suburban, and Urban areas as designated by the Council in 2007. The individual Urban areas are shown in the Executive's proposed regulation. (Planning Board members may explore the maps in greater detail on N:/Road Code Maps/road\_code\_plot\_Board\_packet\_09112008.pdf.)

A description of the proposed standards in regard to the rural, suburban, and urban areas as designated by the Council last year is as follows:

**Rural:** Travel lane widths would remain 12', in agreement with in the uncodified table, but the proposed target speeds would be higher in every area. This is particularly a problem in rural commercial zones where the statutory speed is 30 mph and rural residential hamlets where the statutory speed is 35 mph. By comparison, the minimum target speed in the proposed table is 45 mph. These commercial zones and hamlets are on older roads that are often state highways, but over time some of these roads may be transferred to the County, so we should ensure that we accommodate them properly in our standards now. We should also strive for continuity in driver expectation so that similar roads are posted at the same speed no matter who is responsible for the maintenance.

**Suburban:** Travel lane widths would be reduced from the current 12' standard to 11', in agreement with in the uncodified table. The proposed target speeds are somewhat lower for the roads without development directly abutting the roadway - Controlled Major Highways and Parkways - that have lesser amounts of pedestrian activity. But they are often higher for other roads such as Major Highways and Arterials where we have transit routes and would expect more pedestrians.

**Urban:** Travel lane widths would be reduced from the current 12' standard to 11' generally, but still greater than the 10.5' in the uncodified table. The proposed target speeds for Major

Highways are 5-15 mph higher than what is in that table (up to 40 mph vs. 25 mph). This creates potential hazards in urban areas, particularly where pedestrians are legally crossing at unsignalized intersections (and in fact have the right of way) but where there is little likelihood that drivers will stop.

We should minimize the width of the roadway in Urban areas so that the pedestrian crossing is as short as possible, reducing the pedestrians' exposure to traffic where we have the greatest levels of activity. The proposed standards are too generous with roadway width and neglect to use our local experience with narrower-than-standard streets that work effectively, such as:

Fenton Street between Bonifant Street and Philadelphia Avenue was reconstructed by DHCA several years ago from a four-lane undivided street to a three-lane street with parking bays to provide traffic-calming and additional streetscape amenities. The current curb-to-curb width is 44'. The corresponding proposed standard (No. 2004.25) has 50 feet of pavement, six feet greater with no additional function.

Sixteenth Street (DC) between the District Line and Columbia Heights is 50 feet curb-to-curb for a four-lane divided roadway with a median that is terminated where left-turn bays are needed. The corresponding proposed standard (No. 2004.03) has 62 feet of pavement. Half of the excess pavement is due to the provision of on-road bike accommodation, but the rest has no additional function.

The additional six feet of pavement in both cases would either come out of the sidewalk area or the buildable area of the adjacent properties. In addition to concerns about encouraging undesirably higher speeds in urban areas, this excess area comes at a cost to other users of the roadway and/or owners of the abutting properties. Additional pavement width for bike lanes could also be avoided if the target speeds were lower, enabling bicyclists to share the curb lane with motorized vehicles.

### **Pedestrian Accommodation:**

Along the Road: During the SWG's discussions, the representative for persons with disabilities advocated for requiring six-foot-wide sidewalks minimum generally since this width is sufficient to allow two wheelchairs to ride side-by-side as well as to pass comfortably. (ADA requires five feet minimum.) AASHTO also recommends that sidewalks along Major Highways and Arterials outside central business districts be six feet to eight feet wide.

The proposed cross sections include sidewalk widths of 5.5' min. on Arterials in urban areas all sidewalks on Arterials and Major Highways in suburban areas are proposed to be five-foot-wide. ***Since our Arterials and Major Highways in urban and suburban areas are typically our transit routes and where we expect to find more pedestrian usage, we recommend that these sidewalks be six feet wide minimum.*** We note that bicycles are allowed to be on the sidewalks in Montgomery County and that there are an increasing number of motorized wheelchairs and mobility assistance devices on sidewalks, as well as a much smaller number of Segways. Wider sidewalks would provide more room for these folks to pass pedestrians safely in downcounty areas.

Five-foot-wide sidewalks are proposed along Secondary and Tertiary Residential Roads, wider than our current four-foot-wide sidewalks on such roads. The new standard would meet the ADA minimum width.

Crossing the Road: The proposed regulations would move us more toward a “Complete Streets” approach to design, accommodating all users of the public right-of-way, but pedestrians would receive less of a benefit than would be provided by the roadway design table included in the uncodified portion of the Road Code bill passed in July 2007.

The width of the roadway would be greater than what was originally anticipated in the Road Code bill, partly because of the wider travel lanes and parking lanes but also because of the greater bike accommodation shown in the proposed standards. The bike lanes would make for a longer pedestrian crossing, but they would also provide greater separation from vehicular traffic for pedestrians on the sidewalk. There would not be major changes in the amount of pedestrian space between the curb and the ROW line.

The greatest need for pedestrians is to designate target speeds that are appropriate to their context and consistent with creating a safe pedestrian environment (see below).

**Bicyclist Accommodation:** On-road bicycle accommodation would be included for the first time in the County’s road standards, but there would be no requirement to provide this accommodation unless recommended in a Master Plan. When the Board discussed this topic as part of the review of the original bill last year, your recommendation was that something better than an all-or-nothing approach was needed. That problem remains since there is little guidance as to how any of the new cross sections that include on-road bike accommodation should be applied as opposed to using the old sections that do not include such accommodation. In addition to eliminating the use of the existing road standards, *we recommend that requirements for on-road bike accommodation be included in the proposed regulations as a standalone standard* and that they consist of the following:

Rural Major Highways, Arterials, and Minor Arterials: 5.5-foot-wide bike lanes should be provided.

Suburban Major Highways, Arterials, and Minor Arterials: 5.5-foot-wide bike lanes should be provided if specified in a Master Plan and should be provided on roads with average daily traffic (ADT) of 20,000 vpd or posted speeds of 45 mph or greater. 14-foot-wide curb lanes should be provided on all other Major Highways, Arterials and Minor Arterials.

Urban Major Highways, Arterials, and Minor Arterials: 5.5-foot-wide bike lanes should be provided if specified in a Master Plan. 14-foot-wide curb lanes should be provided on all other Major Highways, Arterials and Minor Arterials.

There are more issues that need to be balanced in urban areas and a greater variety of conditions, such as off-peak parking, that would affect the need for on-road bike accommodation. Since the target speeds should all be in the lowest range, and roads are examined in much greater detail in Sector Plans and other Town Center areas, which constitute most of the urban areas, we believe that the specifics of each road can be best addressed as part of the planning process.

No specific on-road bike accommodation is proposed for Business District Streets or Residential Streets (Primaries, Secondaries, and Tertiaries) and we believe that none is generally needed since these local streets operate at low speeds. On-road bike accommodation should be provided as recommended in Master Plans or Sector Plans.

### Off-Road Accommodation

The proposed standards are incomplete in that they do not include shared use paths for all roads where they are recommended in Master Plans. ***We recommend that shared-use paths be shown as an option in the cross sections for Major Highways, Arterials, Minor Arterials, Primaries, and Business District Streets.***

**Target Speed and Design Speed:** While the urban areas designated by the Council amount to less than 2% of the county, MCDOT believes that they were still too big and include areas they feel are not really urban. The Executive has proposed higher target speeds on major roads in the urban areas, consistent with the opinion expressed by MCDOT that a 25 mph speed on such roads was not realistic, although we already have posted speeds of 25 mph on several Major Highways – Wisconsin Avenue, Old Georgetown Road, and East West Highway in the Bethesda CBD, for example. The proposed range of values for Major Highways in the Urban areas (30-40 mph) exceeds the target speed adopted by the Council (25 mph). MCDOT’s and the proposed regulations’ focus is more on the fringe of the designated Urban areas rather than their core, where most pedestrians are and which was the intent of the Road Code effort. A waiver would be required to use a target speed of 25 mph. Attachment 6 shows a comparison between the target speeds in last year’s Road Code bill and the generally higher speeds in the Executive’s proposal.

At speeds up to 25 mph, vehicles can stop relatively easily for pedestrians. From 25 to 40 mph, the danger to pedestrians greatly increases since the probability of a collision increases. The figure below from the 2000 Cambridge MA Pedestrian Plan shows the difference between two vehicles at the same distance from a pedestrian but traveling at different speeds.

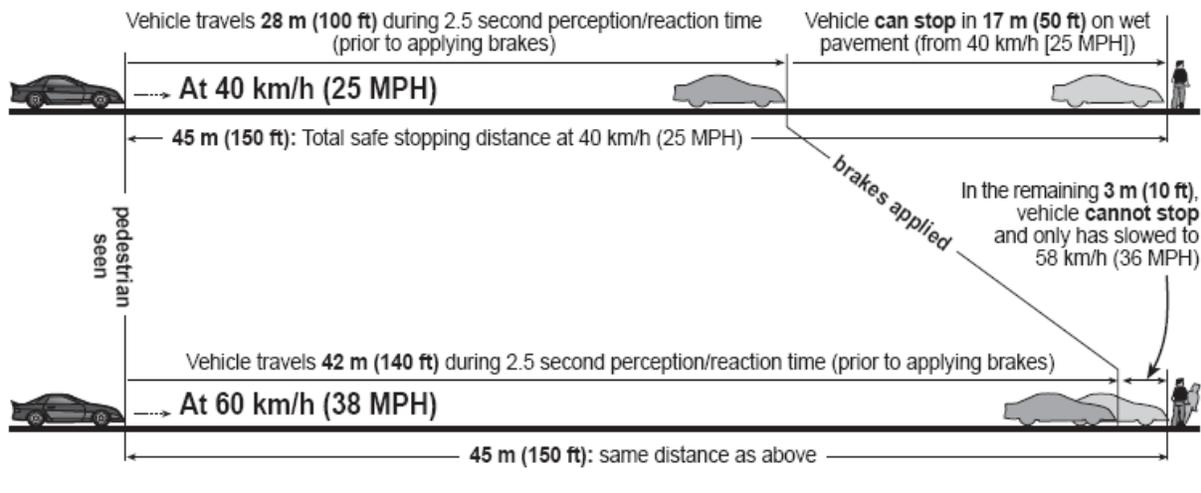


Figure 3: The relationship between safe stopping distance and travel speed.

The probability of a fatality resulting from a collision also increases with speed. At 25 mph, the probability is about 30%; at 40 mph, the probability is about 85%.

The proposed target speeds reflect the Executive's greater priority on motor vehicle mobility, rather than pedestrian and bicyclist safety and mobility, the intent of the Road Code bill. The original wording of the first sentence of the Intent statement for the Target and Design Speed standard read, *"To establish target speeds for the design of county roads that provide safety for all users including pedestrians and bicyclists and provide reasonable mobility for motor vehicle traffic."* Pedestrian and bicyclist mobility was only added at the last SWG meeting at our request, but none of the values were changed. A draft target speed standard was first presented to SWG in mid-January, but a thorough discussion of the needs of bicyclists and pedestrians did not occur until April (more on this below). We believe that the proposed target speeds in general and particularly in the Urban areas are too high; promoting an increase in speeds when a decrease is what was intended by the bill.

A target speed of 25 mph was included in an early draft of the target speed but changed to an asterisked comment at MCDOT's request, making it able to be on used Major Highways, Arterials, and Minor Arterials only in the most urban areas. Because a definition of the "most urban" area that MCDOT felt was sufficiently constraining could not be agreed upon, the 25 mph lower end of the target speed range was dropped altogether.

The Executive's technical consultant for this effort, Vanasse Hangen Brustlin, was chosen to a large extent based on their work on the Massachusetts Highway Department's (MHD's) 2006 Project Development and Design Guide, whose purpose was similar to ours, to make their state highways more context-sensitive. Less than a quarter of the lower end of the ranges in this table exceed 30 mph, whereas about half do in the proposed regulations. The Executive's proposed target speeds exceed what the Council passed last year as well as their consultant's previous work as reflected in the MHD guide.

The proposed target speed standard is also deficient in that it ignores the legal foundation for posting speeds - Maryland Vehicle Law (MVL) (see Attachment 7). MVL is context-sensitive, setting statutory default speeds for roadways according to the level and type of adjacent development. During the SWG process, we advocated for using the statutory speed as the starting point for design, noting that many of the minimum values recommended by the consultant exceeded the default speed and in one case even exceeded the legal maximum speed. We were initially successful in including some discussion of the law in early drafts, but all references to statutory speeds were eliminated in the final version. By comparison, in the Massachusetts guide that the Executive's consultant drafted, such references to the statutory underpinnings of roadway speed are included. Again, what the Executive proposes is at odds with their consultant's previous work, with the result that the target speeds in general tend to drift higher.

The text of the target speed standard includes references stating *"A higher design speed may be used in situations where higher speeds may be expected on a regular basis and the MUTCD guidelines may not allow posting of a lower speed limit."* While the Manual on Uniform Traffic Control Devices (MUTCD) has been adopted for use by the Maryland State Highway Administration, the governing document is Maryland Vehicle Law.

*The target speed standard should be revised to include references to the State statutory speed, which should be considered as the default target and design speed for new roads when beginning the design process. In general, the target speeds should be closer to those shown in the 2007 Road Code bill. The standard should include a requirement of a written waiver for any target speed that exceeds the default statutory speed.*

Curbs on High-Speed Roads: All of the standards for urban and suburban Controlled Major Highways are closed-section roads, including those sections that are intended to be used for speeds of 45 mph and greater. AASHTO states that vertical-face curbs should not be used for roads with speeds greater than 45 mph because of the risk they pose in destabilizing errant vehicles leaving the roadway. *We recommend that the use of standard 6” curbs be restricted to roads with target speeds of 40 mph and less, consistent with our recommended 40 mph cutoff point for street trees next to the road. We recommend that open-section roadways be used for roads with target speeds of 45 mph and above; but where closed-section roads are necessary, lower, safer 4” curbs, as recommended by AASHTO for higher speed situations, should be used.*

Protecting Pedestrians from High-Speed Traffic: The above comments address driver safety, but pedestrian and bicyclist safety on high-speed roads is also a concern. While the Executive’s recommended clear zones would exclude street trees for additional driver safety, no safety provisions are made for the users of the sidewalks and shared-use paths within those clear zones. *We recommend that the Introduction and Application document should include a requirement to consider the installation of guardrail to protect pedestrians and off-road bicyclists where sidewalks and/or shared use paths are within the clear zone of roads with a target speed of 45 mph or greater.*

**Determination of Context:** Street trees are a major element in the public right-of-way, framing the road, separating pedestrians from the traffic and providing them relief from summer heat, and shading the pavement to cool stormwater runoff. With the exception of freeways, which serve only motorized vehicles, public rights-of-way serve many users and functions and most often are bordered by many property owners. The needs of those users are what sets the context, from which we should determine how fast drivers can safely pass through the area.

The proposed target speed standard considers the general context in the selection of the target speed, but does not consider the need for street trees. Since the Tree Placement Standard accepts the target speed as governing where trees can be placed, it is possible that the Master Plan recommendations for our major roadways, such as the Green Corridors Policy, would not be achieved.

A 5 mph difference in the target speed can be a critical factor in a road’s final appearance if the proposed regulation is approved. At 35 mph in the suburban areas, street trees could be planted in their normal location between the curb and sidewalk. At 40 mph under the proposed regulation, which is already an internal MCDOT design policy, the trees would most often be moved to the back of the sidewalk.

Example: The Stringtown Road Extended project in Clarksburg originally had an anticipated posted speed of 40 mph, which would have moved the trees to the back of the

sidewalk. We argued that a future transit station area had to have trees in their normal location and that they should not be moved back to accommodate higher speeds. MCDOT responded by resetting the anticipated posted speed to 35 mph to keep the street trees as intended.

***We recommend that Master Plan guidance as to the streetscaping of major roadways be included in the Target Speed Standard as a consideration in setting the target speed, and that the County Council adopt target speeds for master planned roadways in future area master plan amendments.***

**Street Tree Placement:** The Tree Placement standard assumes that the target speed is set first and that the road design will follow. Several of our area Master Plans call for the institution of a Green Corridors Policy along our major roadways in the suburban areas, with trees lining the roadway on both sides, separating the sidewalks from the roadway. The County's Master Plans should set the context for the design of roadways; the safe operating speed of vehicles can then be determined. (Our recommendation for how to address this in future plans is included in MASTER PLAN IMPACTS below.) The proposed standard would allow the Target and Design Speed standard to govern, setting the trees behind the sidewalk in many cases. This would widen the visual corridor for drivers and encourage them to go faster, while the buffer for pedestrians would be removed.

The standard sets 35 mph as the point beyond which the presence of a curb on closed-section roads is essentially ignored and the higher requirements for a clear zone adjacent to an open-section road (no curb) are used. This standard would codify MCDOT's practice of the last few years, which has been a point of disagreement between our staff and theirs. In the year before the Road Code bill was introduced, we contracted with HNTB, a nationally recognized engineering consulting firm, to do a survey of the safety experience of surrounding jurisdictions of similar roads with and without street trees to determine what the right cutoff point was. They found that there was no significant difference in crash experience for roads (with or without trees) with less than a 45 mph posted speed limit. We therefore recommend that 40 mph be the cutoff point.

The proposed regulation repeats the guidance in the Institute of Transportation Engineers (ITE) document "Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities", which recommends a ten-foot-wide minimum clear zone for closed-section roads with target speeds of 40 mph and above. But for suburban and rural areas, the Executive proposes that the presence of the curb be ignored, and that the wider clear zones for open-section roads recommended by AASHTO be used. This would push the trees farther back and further widen the visual corridor of the roadway. We recommend that the regulation be revised to incorporate the ITE recommendations for a ten-foot-wide minimum clear zone for all closed-section roads with target speeds of 40 mph and above. Rather than place the trees behind the sidewalk, adversely affecting both pedestrian comfort and the appearance of our roadways, we recommend that additional right-of-way be acquired to maintain the trees between the curb and sidewalk while providing a safe clear zone. Our future master plan recommendations for design standards and target speeds will establish the appropriate right-of-way requirements.

The clear zone requirements affecting trees are included in the standard, but the minimum width of medians for the planting of trees is not clearly addressed. Attachment 2 shows our

recommended adjustments in several of the proposed cross sections, including increasing the median width from 17 feet to 18 feet to accommodate a 10-foot-wide turn lane. This would leave an 8-foot-wide area that we recommend be planted with street trees. It is important to ensure that we have a continuous line of trees in medians that is not broken whenever we have left turn lanes.

Clear guidance as to when trees can be planted in medians and trees need to be shown on the final cross section standards. The combination of the Executive's high target speeds and clear zone requirements would mean that medians would have to be a minimum of 22 feet wide, and often greater, to accommodate shade trees at target speeds of 40 mph and above. This requirement would rarely be met.

**Four-Lane Undivided Roadways:** The Executive has proposed standards for four-lane undivided roads in all three areas of the county – urban, suburban, and rural. The American Association of State Highway and Transportation Officials (AASHTO) publication “A Policy on the Geometric Design of Highways and Streets” is the primary highway design guide in the United States. In regard to rural areas, the 2004 edition states (on p. 454), “*All arterials on new locations that need four or more lanes should be designed with a median.*” (Montgomery County's Arterial and Major Highways classifications both fall under AASHTO's definition of arterials.). Divided highways are safer than undivided roads because left-turning vehicles are removed from a running vehicle lane while waiting to make their turn, reducing the possibility of rear-end crashes; head-on collisions are reduced, and pedestrian crossings are made safer by the provision of a pedestrian refuge in the median. The same guide also states, “*Research has shown that four-lane undivided facilities have significantly more collisions than four-lane facilities with medians. Therefore, four-lane undivided facilities should be proposed only as a last resort where a median or turn lanes cannot be provided.*”

AASHTO also states on p. 454, “Undivided arterials with four or more lanes are most applicable in urban and suburban areas where there is concentrated development of adjacent land.” The expectation is that we have lower speeds in such areas, making these roads safer, but should avoid them at higher speeds. Similar to the threshold used for determining street tree location (in front of or behind the sidewalk), ***we recommend that four-lane undivided roads have a maximum target speed of 40 mph, consistent with the recommended cutoff point for greater clear zone requirements.***

**Highway Classifications:** The proposed cross sections would create a ranking system of roadway classification based on the number of travel lanes rather than function that is at odds with our Master Plans:

All urban and suburban Major Highways would be six-lane divided roadways; all rural Major Highways would be four-lane divided roadways: We have four-lane Major highways in the suburban area, as well as a couple of two-lane Major Highways. Most of our Major Highways in the rural area are two-lane roads, not four-lane roads. During the SWG discussions, the technical consultant stated that two-lane Major Highways are somewhat of an oxymoron and suggested that these roads might be more appropriately classified as Arterials. No recommendation has been made to this effect by the Executive, leaving us with proposed cross sections that do not match our Master Plan classifications.

All Arterials would have four or five travel lanes; all two-lane Arterials would be Minor Arterials: The Minor Arterial classification was created as part of the Road Code bill and is defined as a two-lane road, but the bill did not say that all two-lane roads with an arterial function had to be classified as Minor Arterials. We have many two-lane roads that are currently classified as Arterials that do not meet the rest of the definition for Minor Arterial, which states that they are intended nearly equally for through movement and access to adjacent property.

*We recommend that cross section standards be created for two-lane Major Highways in the suburban and rural areas, including a closed-section standard in the suburban area; a four-lane Major Highway in the urban and suburban areas; and two-lane Arterial cross sections for all areas.*

**Country Roads and Country Arterials:** Standards for Country Roads and Country Arterials would be created for the first time. These two classifications are shown on page 233 in the Rustic Roads Master Plan (RRMP), approved and adopted in 1996 (see Attachment 8). The proposed cross sections reflect the middle value for the roadway width: 20' for the Country Road and 22' for the Country Arterial. The Country Road would have a 2' paved shoulder vs. 0'-4' shoulder, grass preferred in the RRMP; and a 4' paved shoulder for the Country Arterial vs. 0'-4' shoulder, grass preferred in the RRMP. Given the increasing use of these roads by bicyclists, we believe that these cross sections are acceptable.

## **MASTER PLAN IMPACTS**

The proposed changes to the County's standards, including the on-road bike accommodation, would have some impacts to our Master Plans. A greater or lesser right-of-way would be required to implement these cross sections and the Master Plan recommendations for roadway rights-of-way should be evaluated to consider these changes. Similarly, additional on-road bike accommodation could either mean a change in a previous recommendation for a different type of facility.

To minimize the potential for disconnects between the Master Plan recommendations and the actual implementation, as capital projects or developments, the target speed and cross section standard for each road in Master Plans, in addition to roadway classification, number of travel lanes, and right-of-way width.

These changes could be done either as a global evaluation of all Master Plans to accommodate the Road Code changes, or could be done as part of scheduled Master Plan amendments. We recommend choosing the latter course since more community-sensitive choices could be made in a plan-by-plan evaluation. In the interim, the new standards would be considered as new projects or developments are proposed.