ST. MARY'S COLLEGE OF MARYLAND

HISTORIC ST. MARY'S CITY

MARYLAND ROUTE 5 PEDESTRIAN CROSSINGS

ST. MARY'S CITY, MARYLAND

RECOMMENDATIONS FOR PEDESTRIAN SAFETY IMPROVEMENTS

FEBRUARY 17, 2009

Prepared by St. Mary's College and Historic St. Mary's City

Table of Contents

A- Introduction

At the Capital Design Advisory (CDA) meeting on November 13, 2008, the community asked the College and City to take a closer look at the needs and alternatives for the Route 5 Pedestrian Footbridge. We listened.

In response, we completed a comprehensive report entitled: Maryland Route 5 Pedestrian Crossings; Analysis of Proposed Pedestrian Footbridge and Alternatives, dated 01/20/09. This report addressed the safety issues that led the College and the City to propose the footbridge, reviewed existing conditions and traffic safety information, and identified criteria for evaluating potential pedestrian safety alternatives. The report also identified a broad range of alternatives, which included:

- Alternative 1.0 No physical improvement (no build);
- Alternative 2.0 Improvements limited to the existing south crosswalk;
- Alternative 3.0 Improvements throughout Route 5 / campus corridor (traffic calming measures);
- Alternative 4.0 Construction of a pedestrian footbridge; and
- Alternative 5.0 Construction of a pedestrian tunnel in place of south crosswalk.

The report included professional review and feedback from Johnson, Mirmiran & Thompson Engineers (JMT) and State Highway Administration (SHA) whose technical information provided value to our initial analysis.

Starting on Wednesday, January 21, 2009, the CDA hosted the first of two open houses that were attended by 150 people including residents from the local community, students, faculty, and staff from both the College and City. Held in Glendening Hall, the open houses provided information on key safety data and each of the alternatives. Representatives from the College, City, and SHA were on hand to answer questions and discuss issues. Individuals were also provided an opportunity to provide feedback by completing a survey at the open house or online at the CDA web site.

On January 26, 2009, the CDA held an open public meeting in the City's auditorium. The presentation included a review of the information provided at the open houses, preliminary results from the surveys, and an overview of the process for developing specific recommendations for the consideration of the College Trustees and City Commissioners. The CDA also solicited questions and comments from the community at this meeting.

Student input has also been sought. Information tables were provided at the Campus Center on January 28th and 29th. A presentation was also made to the Student Government Association on February 3rd.

The survey on pedestrian safety was held open until January 31, 2009 at which point the CDA had received 327 responses from local residents, students, faculty and staff. Generally, the surveys showed strong support for taking action to improve safety for pedestrians and bicyclists. Many individuals commented positively on the open process. The survey results are summarized in Section B of this report.

We wish to thank the community (local residents, students, faculty, and staff of the College and City) for their comments and feedback. In addition to the open houses and CDA meeting on January 26th, we have met with the vestry of Trinity Episcopal Church, the Ridge Volunteer Fire Department, the College Student Government Association, and other community members to increase our understanding of how the various safety enhancing alternatives might affect stakeholders. The inclusiveness of the entire vetting process has served to provide a fresh look at safety concerns involving pedestrians, bicyclists, and motorists. Further, the evaluation of the pedestrian crossing alternatives has been enhanced by community feedback.

Having reviewed the feedback, analyzed additional technical information provided by JMT and the State Highway Administration, and evaluated each of the alternatives based on the criteria identified in the Analysis of Proposed Pedestrian Footbridge and Alternatives report, **the College and City now recommend Alternative No. 3 - Traffic Calming Measures, as our highest priority for improving safety along Route 5.** The balance of this Recommendations for Pedestrian Safety Improvements report reviews the valued feedback we received from the community and addresses the complex issues that led to this recommendation. Overall, we believe traffic calming has the highest potential to address safety concerns for pedestrians and bicyclists along the entire Route 5 within St. Mary's City, Maryland.

For more information, please visit the CDA web site: www.smcm.edu/cda

B- Open House and CDA Surveys

The Route 5 Pedestrian Crossings; Analysis of Proposed Pedestrian Footbridge and Alternatives report and the open houses held on campus on January 21 and 22, 2009 at Glendening Hall provided detailed information on needs and alternatives for improving safety for pedestrians. A total of 150 people attended the open houses and ultimately, 327 survey responses were received. Surveys were either completed by hand at the open houses, by hand at the information stand at the Campus Center, or on-line at the CDA web site. The CDA also received a few e-mails and a letter addressing these issues. A summary of the results are provided herein.

The surveys were divided into three sections; safety concerns, criteria for evaluating alternatives, and open comments. Respondents were also asked to identify themselves as either a student, local resident, or a member of the faculty or staff of either the College or City. The section on safety concerns included eight questions each pertaining to the importance of various safety factors such as the speed of vehicles, lighting, and the dispersed character of pedestrian crossings outside of the two existing crosswalks. The criteria section included ten questions, each dealing with the importance of various criteria that may be used in evaluating solutions to the previously stated safety concerns.

Personalized comments were submitted by 223 survey respondents, or about 68% of the surveys received. The comments varied greatly; the need to slow down traffic, to improve lighting, opposed and not opposed to the footbridge, in favor of traffic calming, and minimizing costs. The full text of the comments received, as well as e-mails and a letter, can be found in Appendix 1.

Safety Concerns: Chart 1 identifies the top three safety concerns of each respondent group. Students were most concerned with the excessive speed of vehicles, inadequate lighting at the crosswalk, and inadequate lighting along shoulders. Community members (local residents) were most concerned with pedestrians crossing outside of the crosswalks, inadequate lighting, and excessive speed of vehicles. Faculty/staff had the same top three concerns as community members but in a slightly different order. Further, the survey indicates that local residents as well as faculty/staff consider the need to address excessive vehicle speed, inadequate lighting, and the ad hoc nature of pedestrian crossings to range from “very important” to “extremely important.”

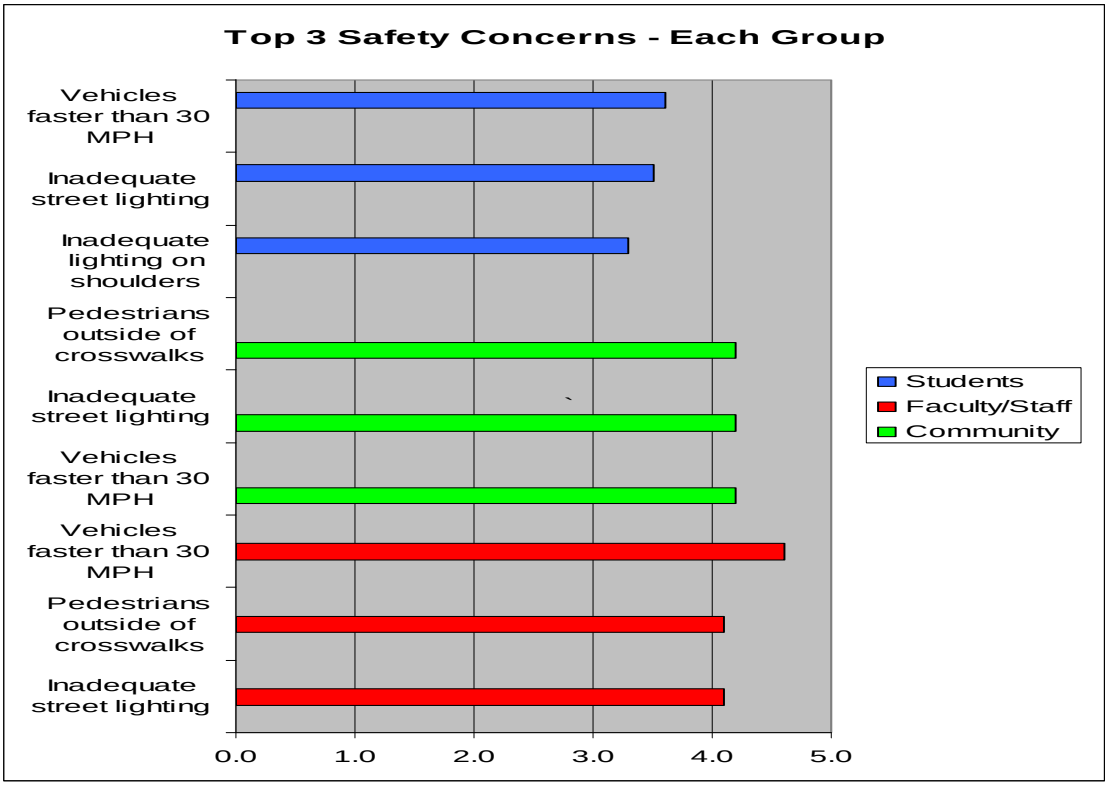

Chart 1: Top Three Safety Concerns

Criteria: Regarding the importance of criteria, Chart 2 below illustrates that community members and faculty/staff agreed that improving pedestrian safety, preserving archaeology, and preserving the environment are the three top factors that should be considered in any design solution. Students also agree that preserving archaeology and the environment were top considerations but felt that cost was more important than improving pedestrian safety. Improving pedestrian safety was the fourth highest choice for students while community members ranked cost as the fourth highest choice. Faculty/staff rated improving bicycle safety as the fourth highest choice.

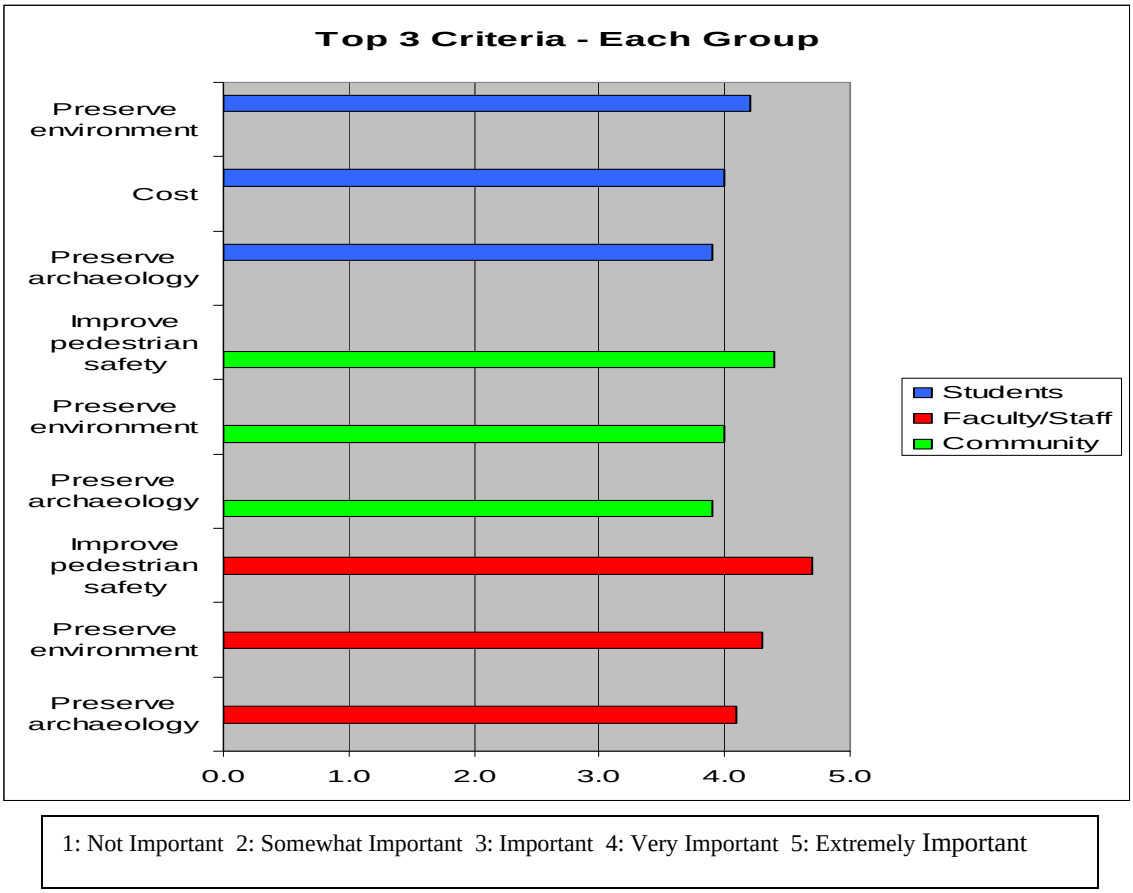

Chart 2: Top Three Criteria

As shown above, there is strong agreement among local residents and faculty/staff that improving pedestrian safety is the highest priority, with results ranging from "very important" to "extremely important."

Open Comments: In the open comment section of the survey, respondents provide a wide variety of suggestions, express preferences regarding the alternative solutions, and identify concerns. Highlights of the most frequent comments include:

- improve lighting (66 comments)
- support for traffic calming (58 comments)
- support for improving the existing crosswalk through a variety of means such as a traffic light, rumble strips, stop sign (36 comments)
- suggestions for better enforcement of the speed limit (23 comments)
- mixed support for the footbridge (23 comments for vs. 93 comments against)

- educate students about safe behavior crossing Route 5 (15 comments)
- appreciate the process – presentations, communication, etc. (8 comments)

Summary of Feedback: In summary, survey respondents agree that:

1. Improving pedestrian safety is very important and that action should be taken to:
    - Slow down vehicles that are traveling too fast through the Route 5 campus corridor
    - Improve street lighting in areas of pedestrian crossings and along shoulders
    - Address pedestrians crossing at points other than designated crosswalks
2. Any proposed solution should minimize impacts to the environment and archaeology.

These survey results favor traffic calming as the most appropriate alternative as this best addresses the key issues. Traffic calming is also the most favored alternative by those respondents expressing a preference in the open comment section of the survey.

A compendium of the survey results along with each comment received with surveys can be found in Appendices 1 and 2.

C- Evaluation of Alternatives

Objectives: The Analysis of Proposed Pedestrian Footbridge and Alternatives report identified specific objectives and criteria for evaluating alternatives for improving pedestrian safety. Based on the results of the survey (Appendix 2), these criteria can be weighted to reflect the concerns of the local community, faculty/staff, and students. A review of the objectives and the relative weight for each of the criteria follows. Weights assigned to each criteria (or sub-criteria) range from 3 to 1.

1. Pedestrian Safety: Provide a pedestrian path or pathway system across and along Route 5 that is safe for pedestrians.

   Evaluation Criteria: Options which promote safe vehicle speeds, improved pedestrian visibility, and/or separation between vehicles and pedestrians will be given preference.

   Weight: The primary objective for any alternative is to improve safety. Pedestrian safety was also the highest rated criteria by survey respondents. Accordingly, this criterion is given the highest weight and is broken into the sub-criteria identified by the survey respondents as the most important safety factors (Appendix 2):

   a) Reducing excessive speed of vehicles: weight = 3

   b) Improving lighting at crosswalks: weight = 3

   c) Addressing the ad hoc nature of pedestrian crossings: weight = 2

   d) Improving lighting along Route 5: weight = 1

2. Protection of Resources: Provide pedestrian path or pathway system across and along Route 5 that minimizes impacts to archaeology and the environment.

   Evaluation Criteria: Options that minimize excavations in archaeologically significant areas will be preferred options. Options which provide opportunities for enhanced environmental effects will be also be preferred.

   Weight: This criterion is split into two separate sub-criteria with weights reflective of their high importance as established by survey respondents:

   a) Environmental preservation: weight = 3

   b) Archaeological preservation: weight = 3

3. Cost: Minimize overall costs to the project.

Evaluation Criteria: Options with a lower price tag are considered better than options with a higher price tag.

Weight: 3

4. Bicycle and Vehicular Safety: Provide pathway and roadway conditions to improve safety for bicycles and vehicles.

   Evaluation Criteria: Those options which promote safe vehicle speeds and/or separation between vehicles and bicycles will be given preference.

   Weight: This criterion is split into two separate sub-criteria as follows:

   a) Improving bicycle safety: weight = 2

   b) Improving vehicular safety: weight = 1

5. Viewshed & Sense of Place: Provide a pedestrian path or pathway system across and along Route 5 that minimizes negative impacts or improves aesthetics and sense of place.

   Evaluation Criteria: Options which improve the viewshed and sense of place will be most preferred. Otherwise, options will be considered on the basis of minimizing impacts to the viewshed.

   Weight: This criterion is split into two separate sub-criteria as follows:

   a) Preserve the existing viewshed: weight = 2

   b) Improve the aesthetics of the existing viewshed: weight = 1

6. Accessibility: Provide a pedestrian path or pathway system across and along Route 5 that is barrier-free from the Campus Center to the high land of the historic campus (Calvert, Kent, State House).

   Evaluation Criteria: Those options which provide graded pedestrian pathways of 5% or less are most preferred. Options which provide ramped pedestrian pathways of 5% to 8% are less preferred. Options that provide pathways greater than 8% are not accessible without the use of vertical lifts and are considered to be not acceptable.

   Weight: 1

7. Vehicle Congestion: Provide a controlled pedestrian path or pathway system across and along Route 5 that minimizes impacts to vehicular traffic flow.

   Evaluation Criteria: Options that provide for a smooth flow of traffic at the existing 30 mph speed limit will be preferred options.

   Weight: 1

Alternative Evaluation: Determination of a preferred solution is assisted by assessing each alternative based on the above criteria. The following section of this report describes the degree by which each alternative meets the criteria.

Alternative 1.0 *Do Nothing:*

1. Pedestrian Safety:

   a) Excessive speed of vehicles: No effect.

   b) Lighting at crosswalk: No effect.

   c) Ad hoc pedestrian crossings: No effect.

   d) Lighting along Route 5: No effect.

2. Preservation of resources:

   a) Environmental resources: No effect.

   b) Archaeological resources: No effect.

3. Cost: No cost.

4. Bicycle and vehicle safety: No effect.

5. Viewshed:

   a) Preserve existing: Viewshed preserved.

   b) Enhance aesthetics: No effect.

6. Accessibility: No effect. Maintains the existing ADA accessible pathway at the main crosswalk.

7. Vehicle congestion: No effect. Neither increases nor decreases traffic congestion.

This alternative is not feasible since it does nothing to improve safety of pedestrians. Survey results and comments received strongly support the notion that there is a safety problem and that the "do nothing" approach is not appropriate.

Alternative 2.1 *Improve roadway lighting at crosswalks:*

1. Pedestrian Safety:
    a) Excessive speed of vehicles: No effect.
    b) Lighting at crosswalk: Provides increased visibility of pedestrians using the crosswalks.
    c) Ad hoc pedestrian crossings: No effect.
    d) Lighting along Route 5: No effect.
2. Preservation of resources:
    a) Environmental resources: No effect.
    b) Archaeological resources: No effect.
3. Cost: Cost is minimal.
4. Bicycle and vehicle safety: Provides increased visibility of bicyclists using the crosswalks.
5. Viewshed:
    a) Preserve existing: Viewshed preserved.
    b) Enhance aesthetics: No effect.
6. Accessibility: No effect. Maintains the existing ADA accessible pathway at the main crosswalk.
7. Vehicle congestion: No effect. Neither increases nor decreases traffic congestion.

    This alternative is feasible if combined with other alternatives that effectively address vehicle speeds and the ad hoc crossing patterns. By itself, it does little to improve safety other than at night.

Alternative 2.2 *Traffic Signals at Crosswalk:*

1. Pedestrian Safety:

   a) Excessive speed of vehicles: Vehicles would be required to stop when activated. If the light is not changed to red, the traffic light will have negligible effect in reducing speed through the corridor.

   b) Lighting at crosswalk: No effect.

   c) Ad hoc pedestrian crossings: No effect.

   d) Lighting along Route 5: No effect.

2. Preservation of resources:

   a) Environmental resources: No effect.

   b) Archaeological resources: No effect.

3. Cost: Cost is moderate – roughly $100,000 per crosswalk.

4. Bicycle and vehicle safety: Bicyclist unlikely to stop to wait for light to change.

5. Viewshed:

   a) Preserve existing: May be considered as a viewshed detriment by some people.

   b) Enhance aesthetics: No effect.

6. Accessibility: accessibility is improved for blind pedestrians who cannot see traffic approaching a crosswalk and will rely on the traffic signal sound for safe crossing. Otherwise no effect.

7. Vehicle congestion: Would have a slight impact on vehicle congestion during off peak crossing times but would improve traffic congestion during peak crossing times.

Feedback from the surveys suggests that some people support this alternative while others are against it. Its practicality is questionable given that many pedestrians would not wait for the light to change to cross Route 5. Further, SHA has indicated that the crosswalks lights at this location would probably not meet their requirements for crosswalk signals based on the overall pedestrian crossing count. Therefore we are not recommending this alternative.

Alternative 2.4 *Crosswalk enhancements (bump-outs):*

Picture 1: Bump-out at Bel Air, Maryland.

1. Pedestrian Safety:

   a) Excessive speed of vehicles: Bump-outs will have some effect on slowing vehicle speeds. Additional benefit is provided by improving the visibility of the crosswalk.

   b) Lighting at crosswalk: No affect unless combined with alternative 2.1.

   c) Ad hoc pedestrian crossings: somewhat slower vehicle speeds will have some effect on reducing risk of pedestrians crossing outside of crosswalks.

   d) Lighting along Route 5: No effect.

2. Preservation of resources:

   a) Environmental resources: No effect.

   b) Archaeological resources: No effect.

3. Cost: Cost is moderate – roughly $100,000 to $200,000 range per crosswalk.

4. Bicycle and vehicle safety: Bicycle safety improved modestly if vehicles speeds are reduced

5. Viewshed:

   a) Preserve existing: No effect.

   b) Enhance aesthetics: No effect.

6. Accessibility: Crosswalk improvements would improve accessibility over the existing crosswalks by providing contrasting colors and textures. Otherwise no effect.

7. Vehicle congestion: Would have a slight impact on vehicle congestion during off peak crossing times but would improve traffic congestion during peak crossing times.

This alternative meets some of the criteria well but its effect on pedestrian safety is modest. Some surveys endorsed this concept but many others pointed out that this solution only addresses the crosswalks and not the entire traffic corridor. Therefore, we are not recommending this alternative.

Alternative 3.0 *Traffic calming measures throughout the Route 5 corridor:*

1. Pedestrian Safety: Overall, traffic calming has been shown to be highly effective in reducing accidents. The Federal Highway Administration estimates that traffic calming can reduce accidents by 25% to 46%. Crosswalks would be better defined as would pedestrian walkways and bicycle paths.

   a) Excessive speed of vehicles: Most effective at improving safety by encouraging speed limit compliance throughout the entire corridor.

   b) Lighting at crosswalk: Provides increased visibility of pedestrians using the crosswalks.

   c) Ad hoc pedestrian crossings: Slower vehicle speeds will reduce risk for pedestrians crossing outside of crosswalks. Sidewalks along Route 5 would eliminate walking in shoulders.

   d) Lighting along Route 5: Lighting along the entire corridor would improve visibility.

2. Preservation of resources:

   a) Environmental resources: No net increase in impervious surfaces. Has the opportunity to improve storm water runoff by treating road drainage that currently runs directly into St. Johns pond and/or the river.

   b) Archaeological resources: No effect.

3. Cost: Cost is roughly $1,000,000 to $2,000,000 depending on the scope.

4. Bicycle and vehicle safety: Bicycle safety improved with the addition of bicycle lanes.

5. Viewshed:

   a) Preserve existing: No effect.

   b) Enhance aesthetics: Would improve the viewshed and provide a sense of arrival now missing at St. Mary's City.

6. Accessibility: Crosswalk improvements would improve accessibility over the existing crosswalks by providing contrasting colors and textures. Otherwise no effect.

7. Vehicle congestion: Vehicle congestion would not be impacted. Vehicles would be encouraged to travel at the posted speed limit.

This alternative is considered the most feasible as it best addresses most of the criteria throughout the entire corridor. Many surveys supported this type of approach. Concerns about this alternative center on the cost. Refer to Part C for more information on the traffic calming alternative.

Alternative 4.0 *Construct a pedestrian footbridge:*

1. Pedestrian Safety:

   a) Excessive speed of vehicles: According to SHA, the footbridge may increase vehicle speeds by giving motorists a false sense of limited pedestrian access on Route 5.

   b) Lighting at crosswalk: The existing crosswalk is removed, eliminating the problem.

   c) Ad hoc pedestrian crossings: The footbridge provides a safe and convenient path for crossing Route 5 at only one point. As this alternative does not decrease vehicle speeds, and may in fact increase speeds, risk to pedestrians crossing at locations other than the footbridge could be increased.

   d) Lighting along Route 5: No effect.

2. Preservation of Resources:

   a) Environmental resources: Additional impervious surfaces would be modest. Storm water management devices could actually improve runoff.

   b) Archaeological resources: The footbridge has potential impact on archaeological resources. Some mitigation would likely be required.

3. Cost: Cost is roughly $1,500,000.

4. Bicycle and vehicle safety: Bicycle safety improved for bicyclist crossing Route 5 at the current south crosswalk location. Safety along Route 5 would not be improved.

5. Viewshed:

a) Preserve existing: The viewshed would be impacted.

b) Enhance aesthetics: The footbridge may enhance the sense of arrival, but might detract from aesthetics.

6. Accessibility: The footbridge would improve accessibility.

7. Vehicle congestion: The footbridge would eliminate traffic congestion present at the current south crosswalk during periods of high volume pedestrian crossings.

This alternative provides for the safest pedestrian crossing at the current south crosswalk location since it completely separates pedestrian and vehicular traffic. The risk to pedestrians traveling along or across Route 5 at other locations, however, could be increased. Survey results were mixed with both favorable and unfavorable comments. Most unfavorable comments were concerned about viewshed, cost, and failure to address the safety needs of the entire corridor.

Alternative 5.0 *Construct a pedestrian tunnel:*

1. Pedestrian Safety: As noted in the Analysis of Proposed Pedestrian Footbridge and Alternatives report, the tunnel would require a deep excavation to accommodate a 33-foot drop in elevation between the historic campus and Route 5. Total ramping for both sides of the road would be at least 700 feet.

a) Excessive speed of vehicles: The tunnel may increase vehicle speeds by giving motorists a false sense of limited pedestrian access on Route 5.

b) Lighting at crosswalk: The existing crosswalk is removed, eliminating the problem.

c) Ad hoc pedestrian crossings: As this alternative does not decrease vehicle speeds, and may in fact increase speeds, risk to pedestrians crossing at locations other than the footbridge could be increased.

d) Lighting along Route 5: No effect

2. Preservation of resources:

a) Environmental resources: A tunnel would pose some significant environmental problems due to the large amount of dewatering and excavations required.

b) Archaeological resources: The tunnel has the greatest potential to impact archaeological resources. Significant mitigation would be required.

3. Cost: Cost is $2,500,000 or more.

4. Bicycle and vehicle safety: Bicyclists would not use the tunnel due to the switchbacks. Safety along Route 5 would not be improved.

5. Viewshed:

   a) Preserve existing: No effect.

   b) Enhance aesthetics: Deep ramping would negatively affect the landscape.

6. Accessibility: The tunnel would be fully accessible. However, the extent of switchback ramping will create an extended travel distances.

7. Vehicle congestion: The tunnel would eliminate traffic congestion present at the current south crosswalk during periods of high volume pedestrian crossings.

A tunnel is not considered as a feasible alternative since it does not provide a convenient path of travel, does not address safety along the entire corridor, has a significant impact on archaeology, and is the most expensive option. Survey comments stated that many people were not in favor of a tunnel due to cost, practicality, and safety concerns. Therefore we are not recommending this alternative.

Scoring of Alternatives: Based on the analysis of how each alternative meets the criteria requirements, a numerical analysis can be performed to determine the best overall alternative. Values, derived directly from the above analysis, can be assigned to reflect the degree by which the alternative meets each of the criteria. Each value can then be multiplied by the criterion weight to determine a total score. Values are assigned using a scale of 0 to 5 (see below). Weights were based on the criterion's importance as reflected in the surveys (see "Objectives" above).

Examples: Criteria	Value	x	Weight	=	Criteria Score
Reduce vehicle speed	3		3		9
Cost	2		3		6
Preserve viewshed	5		2		10

Definition of Criteria Values:

0 = fails to meet the criterion in any way

1 = marginally meets the criterion

2 = minimally meets the criterion

3 = meets some aspects of the criterion

4 = meets many aspects of the criterion

5 = fully meets all aspects of the criterion

A complete tabulation of this numerical analysis can be found in Appendix 3. Overall, the scoring of alternatives from high to low was:

1. Traffic calming measures applied throughout the traffic corridor* – 110 Points
2. Making improvements at the south crosswalk* – 80 points
3. Constructing a pedestrian footbridge at the south crosswalk – 45 points
4. Constructing a tunnel at the south crosswalk – 35 points
5. Do nothing - 56 points

* includes lighting improvements at crosswalks

The chart below proposes a simplified method to determine how much each alternative meets the evaluation criteria. Criteria are ranked in order of importance based on the survey results (see Appendix 2). A color-coded box indicates how well the pedestrian safety improvement alternatives meet the objective of each criterion.

Maryland Route 5 Pedestrian Crossings - Alternative Analysis

Criteria: *Listed from Highest to Lowest Priority*	**Alternative 1.0** Do Nothing	**Alternative 2.0** Crosswalk Improvement	**Alternative 3.0** Traffic Calming	**Alternative 4.0** Footbridge	**Alternative 5.0** Tunnel
A. Improve Pedestrian Safety					
1 Reduce Vehicle Speed					
2 Lighting @ Crosswalks					
3 Crossing Outside of Crosswalks					
4 Lighting along Shoulders					
B. Preserve Environment					
C. Preserve Archaeology					
D. Costs					
E. Improve Bicycle Safety					
F. Viewshed: Preserve Existing					
G. Improve Vehicle Safety					
H. Improve Accessibility					
I. Minimize Vehicle Congestion					
J. Viewshed: Enhanse Aesthetics					

Key

- Does not meet objective
- Partially meets objective
- Fully meets objective

D - Recommended Alternatives

1. Improve lighting:

Good quality and placement of lighting can enhance an environment as well as increase comfort and safety. Pedestrians often assume that motorists can see them at night; they are deceived by their own ability to see the oncoming headlights. Without adequate overhead lighting, however, motorists may not be able to see pedestrians in time to stop. According to the Federal Highway Administration, a good roadway lighting system can reduce nighttime crashes by more than 20%.

Lighting along this section of the roadway is inconsistent. At night, alternating brightly lit and mostly dark areas increases risk for motorists and pedestrians. Some inadequate light fixtures create glare which further deteriorate poor night visibility. These conditions worsen during rainy or foggy times.

The survey results (see Section B above) show that a vast majority of the public has made the observation that the current lighting is inadequate and needs immediate improvement. Inadequate street lighting is indeed ranked the #2 safety concern by the public, just after excessive vehicle speed.

An improved lighting system is recommended to be part of any pedestrian safety improvements constructed along Route 5. Installation of improved lighting will not, however, improve safety during the day, thus necessitating the need to provide additional safety measures. **Because the need to improve lighting conditions is immediate and urgent, temporary lighting improvements should be implemented as quickly as possible in the vicinity of the existing south crosswalk.**

2. Traffic Calming:

a. *Overview:* Traffic calming is a way to design a roadway that improves safety by encouraging motorists to drive more slowly. According to the Federal Highway Administration, traffic calming can reduce vehicle speed by 5% to 20%. Traffic calming does not aim at solving a safety problem at one particular location. It is rather a series of physical measures, with elements such as lighting and landscaping, that provide safety benefits over an entire section of the roadway. By doing so, traffic calming recognizes the complexity of pedestrian traffic patterns and takes into account potential ad hoc crossings.

Proposed as a holistic approach to pedestrian and bicyclist safety, traffic calming is a powerful and compelling tool that has proven to be very

effective. According to Johnson, Mirmiran & Thompson's "Conceptual Options for Traffic Calming," dated February 13, 2009 (see Appendix 4), traffic calming "provides for lowering speeds which in turn provides for a greater reaction time for motorists to break for pedestrians and also gives the pedestrian an increase in time to determine if a gap is acceptable to cross the roadway. In addition, any crashes that would occur would be less serious in nature." Some of its effects, such as fewer crashes (25 to 46% reduction according to the Federal Highway Administration), are clearly measurable. Others, such as supporting community livability, are less tangible, but also important.

b. Description: Traffic calming is a combination of physical elements that change the character of the roadway. The list of possible traffic calming elements is very large. The choice of the appropriate traffic calming elements and their combination to obtain maximum effectiveness and still accommodate the constraints of the site is done during the design phase. However, according to Johnson, Mirmiran & Thompson's letter: "Conceptual Options for Traffic Calming" traffic calming measures along Route 5 are likely to incorporate the following elements (see Appendix 4):

- Narrowing of traffic lanes from 11 to 12 feet to 10 to 11 feet to induce slower vehicle speed
- Median islands, small or extended, to provide visual clues to motorists that the roadway is entering a section with different characteristics
- Enhanced crosswalks with colored / textured pavement and/or improved pavement marking
- Bicycle lanes to provide an identified dedicated space for bicyclists. The existing shoulders which are 5 to 10 feet wide will be reduced to 4 to 5 feet wide and dedicated to bicyclists.
- Curb and sidewalks to provide a safe, comfortable space for pedestrians along the roadway. Curbs also indicate to motorists that the roadway is entering a section of more urban characteristics and induces lower vehicle speeds.
- Landscaping to alert motorists that the roadway is entering a section with different characteristics. The rhythm of tree placement can also affect vehicle speeds.

- Street lighting at crosswalks and along sidewalks to increase visibility. Vertical elements along the roadside (such as light poles and trees) contribute to reducing vehicle speed.

The indicative conceptual typical roadway sections in Appendix 5 incorporate some of the elements indicated above and illustrate possible traffic calming alternatives.

In addition to safety and maintenance standards established by the Federal and State Highway Administrations, the design of traffic calming on Route 5 through St. Mary's City will need to accommodate various constraints that stem from the specific usage of this section of the roadway. Similar roadway sections in other parts of Maryland have been reduced to as little as 26 feet 6 inches from curb to curb. The final design for the section of Route 5 through St. Mary's City will likely be between 28 and 30 feet to accommodate oversize farming machinery and also provide sufficient space for an emergency vehicles (with cars pulled over into the bike lane/shoulder on both sides). The conceptual roadway sections shown in Appendix 5 demonstrate how traffic calming can accommodate emergency vehicles. Moreover, the roadway will not have a rugged pavement like cobblestone or feature drastic speed-reducing elements such as speed bumps. The access to the post office will certainly be maintained from both directions.

Traffic calming will very likely focus on the section where pedestrian traffic is most present and where risk is greatest: approximately between the existing south crosswalk and St. John's pond bridge. However, traffic calming is scalable and could be extended north and south to slow traffic down before reaching the core area and to provide safety benefits to all areas along Route 5 through St. Mary's City. To achieve its full effect, traffic calming is desired to extend from the rugby field north of Fisher's Creek to Rosecroft Road. An example of potential traffic calming concepts across the entire City corridor can be found in Appendix 4. A project of this scale would likely be accomplished in multiple phases over time.

c. *Potential additional elements:* In addition to the typical repertoire of traffic calming measures mentioned above, Route 5 improvements throughout the City and the College provide the opportunity to consider a number of additional elements:

- Intersection with Trinity Church Road: The current alignment of Trinity Church Road with Route 5 creates unsafe condition for motorists who want to turn right onto southbound Route 5. The turn is very difficult

to make without crossing the opposing northbound traffic. Moving the intersection approximately 80 feet south would improve safety and convenience. No other changes to Trinity Church Road are contemplated.

- Pedestrian access to the Rugby Field: Pedestrians currently walk on Fisher's Creek bridge although it is not wide enough to allow a safe pedestrian circulation. Improvements to pedestrian safety can consist of either providing a separate pedestrian footbridge adjacent to the existing bridge or widening the existing bridge to accommodate a sidewalk.

- Gateways: Landscaped median islands or shoulders provide the opportunity to create gateways that mark the arrival to the College and the City with attractive planting and signage. Other possibilities include masonry piers at the corners of the Fisher's Creek bridge to mark entrance to the City.

- Realignment of Mill Field Drive (service road to the Campus Center and Library): Moving the entrance to Mill Field Drive south so it aligns with State House Road would improve safety at this intersection.

- Traffic circles: Traffic circles are used to manage traffic flows at intersections and sometimes used to alert motorists that they are entering a section of roadway with different characteristics. They are very effective in reducing vehicle speed. The design phase of the traffic calming project provides the opportunity to evaluate if traffic circles would provide any benefits in terms of safety and traffic flow at either or both entrance of St. Mary's City.

- Access to the post office parking lot: The current post office lot is small and provides cramped access and parking. The roadway realignment combined with a potentially narrower shoulder may help improve vehicular access to the post office lot.

Examples of traffic calming improvements that include these additional elements can be found in Appendix 4.

d. *Environmental Benefits:* Because of the limited excavation required primarily in the roadway right-of-way, traffic calming will only have a very limited impact on archaeological resources. In addition, traffic calming provides an excellent opportunity to improve the environmental conditions. The current drainage system of Route 5 south of St. John's pond bridge consists of a concrete swale that collects the highly polluted storm run-off

from the roadway pavement and dumps it directly into St. John's pond without the benefits of any treatment or filtration (see Picture 2 below). North of the bridge, the roadway pavement run-off is mostly collected into storm drainage inlets located in the east shoulder. These inlets drain directly into St. Mary's River (see Picture 3). Consistent with the City's and College's environmental stewardship values, traffic calming will provide the opportunity to enhance the roadway drainage system and develop storm water management measures that can drastically improve the quality of the water flowing into the St. Mary's River.

Picture 2: Concrete Swale across from the Post Office

Picture 3: Inlet at Yaocomaco Drive (Queen Anne Hall)

e. *Survey Results:* The survey results (see Appendix 2) show that the community's primary concerns are:

1) Vehicle speed faster than 30 mph
2) Inadequate street lighting
3) Pedestrians outside of crosswalks

Traffic calming seems particularly suited to address these concerns. The main purpose of traffic calming is indeed to contain vehicle speed. Physical elements such as narrow lanes, curbs, sidewalks, and street trees encourage motorists to decrease speed by as much as 20%. Traffic calming can also incorporate improved lighting by providing street light along the entire section of the roadway with particular attention at the main crossing locations. By enticing motorist to slow down not just at one location but for the entire improve section, traffic calming reduces risk for pedestrians crossing outside of crosswalks.

According to the survey results, the public's most important criteria in the design of pedestrian safety improvements are:

1) Improve pedestrian safety
2) Preserve the environment
3) Preserve archaeology

Traffic calming meets these criteria very well. By reducing vehicle speed, traffic calming has been shown to improve pedestrian safety by reducing the risk and severity of crashes by as much as 46% according to the Federal Highway Administration. Traffic calming provides the opportunity to greatly improve the quality of the water that flows to St. John's pond and the St. Mary's River by providing state-of-the-art stormwater management facilities (currently inexistent), planting additional trees, and reducing paved areas. Traffic calming is mostly confined to the existing roadway footprint and unlikely to generate large excavations that would impact archaeological resources.

We have also noticed that traffic calming was mentioned numerous times in a positive way in the open comments received from community members who attended the open houses and responded to the survey.

f. *Funding:* As stated above, the cost of traffic calming depends on the length of the roadway section that is treated. It also depends on the choice of elements that are included in the traffic calming project. The highest priorities are to: a) provide effective traffic calming to the core section of Route 5 between the Campus Center and the inlet to St. John's pond, and b) provide safe pedestrian traffic across the inlet to Fisher's Creek by installing a footbridge along side the existing vehicular bridge.

Currently, $1.5 million has been provided by the federal government to support the footbridge or other pedestrian safety improvements in St. Mary's City. These funds can be used for the traffic calming initiative and will be used to accomplish the above two priorities in the most cost effective manner. Any funds unspent on these sections will be utilized to extend traffic calming beyond the core section.

g. *Recommendation:* **Based on the evaluation of the criteria; feedback from the local community, students, and faculty/staff of the College and City; and recommendations from JMT engineers, traffic calming is recommended as the preferred alternative for improving pedestrian and bicycle safety.**

3. Pedestrian Footbridge:

a. *Overview:* As outlined in Analysis of Proposed Pedestrian Footbridge and Alternatives report, a footbridge would benefit pedestrian safety at the location of the existing south crosswalk. By providing a grade separation between pedestrian and vehicles, the bridge would provide a safe condition for all pedestrian who would utilize the new overpass. The pedestrian footbridge, however, does not address the significant portion of pedestrian risk that occurs outside of the south crosswalk. For example, a footbridge will not improve safety for pedestrians and bicyclists traveling along Route 5, going to the post office or crossing Route 5 in the area of the J. P. Muldoon River Center. Further, the potential that the footbridge might actually increase vehicle speeds and reduce driver awareness of pedestrians in other points along Route 5 is very concerning. Therefore, the pedestrian footbridge is recommended only if it is completed in conjunction with traffic calming.

b. Survey: The survey offers very mixed results for the bridge alternative. The community's main concerns (vehicle speed, inadequate lighting and pedestrian crossing outside of crosswalks) would not be addressed by the construction of a pedestrian overpass. Although it has a minimal

environmental impact, the bridge is expected to have some impact on archaeological resources that will require careful planning and mitigation.

The footbridge was mentioned frequently in the open comment section of the survey. While there were many who favored the footbridge, most comments were against its construction.

c. *Recommendation:* Pedestrian safety would be most improved through a combination of traffic calming and the pedestrian footbridge. Funding is not available, however, to address both alternatives. **Because the footbridge is of a lower priority than traffic calming, the footbridge will not be pursued at time.**

4. Not recommended alternatives:

The following alternatives or suggestions are not considered feasible or effective and are therefore not recommended. See Johnson, Mirmiran & Thompson's letter dated February 13, 2009 in Appendix 4 for additional information.

- Unorthodox signage and markings
- Stop signs: Motorists would have to stop even with no pedestrians on the crosswalks, delaying traffic when not needed. Therefore, the compliance to the signs will likely not be high. This solution would increase delay for motorists and increase potential rear end crashes.
- Rumble strips: Though enticing motorists to reduce speed where located, rumble strips don't have an impact over a significant section of roadway. The Federal Highway Administration also notes that rumble strips can be a possible danger to cyclists who cross them and a nuisance because of the noise they generate.
- Speed bumps: SHA is not allowing speed bumps on roadways such as Route 5.
- Traffic cameras: at this time traffic cameras are not legal in St. Mary's County.
- Road side radars: Though certainly effective to slow down motorists in the short term, its effectiveness is likely to decrease in the long term for motorists familiar with this area.
- In-pavement warning lights: SHA is not at this time supporting the use of this device for maintenance reasons.

APPENDICES