TECHNICAL MEMORANDUM

DIAGNOSTIC STUDIES OF HIGHWAY VISUAL COMMUNICATION SYSTEMS

HPR-2(108)

PILOT SITE NUMBER 6

MARYLAND STATE HIGHWAY 26 NEAR BALTIMORE, MARYLAND

TM2(108)-6

INTRODUCTION

The "Diagnostic Studies of Highway Visual Communication Systems" research project has been designed to: (1) review the current practices in visual communications with the automobile driver using a multi-discipline team approach; (2) identify the deficiencies in these practices; and (3) recommend changes in the existing standards. Pilot studies were conducted in three states (Arkansas, California, and Maryland) in order to develop the diagnostic study techniques and to acquaint the members of the Project Policy Committee with these procedures. This memorandum is a detailed report on the results of the diagnostic team review of sites within these states. The opinions expressed are those of the diagnostic team and not the recommendations of the research staff. The results of pilot studies and the improvements recommended by the staff will be combined as an interim report to be published in the near future.

DESCRIPTION OF STUDY PROCEDURES

The diagnostic evaluation of the study site was conducted using both the driver interview and the open-end questionnaire techniques. Each member is asked to drive a route following the instructions of the interviewer. The route included short sections on adjacent facilities as illustrated in Figure 1. The driver was asked to comment on the roadway section as he drove, and these comments were recorded. The interviewer asked questions only as necessary to keep the conversation productive. At the conclusion of each driving phase (night and day), the subject was asked to complete a questionnaire. The interviews and the comments on the questionnaire are the basis of the material presented in this memorandum.

STUDY SITE CHARACTERISTICS

Pilot Site Number 6 is located on Maryland State Highway 26 approximately seventeen miles northwest of Baltimore, Maryland. The section of roadway studies is rural in nature and extends from a point approximately one-half mile east of the MD26 to a point one-half mile west of the Franklinville Road Intersection. The study section is approximately five and one-half miles in length.

Maryland State Highway 26 has a 44 foot roadbed section consisting of two 12-foot bituminous concrete surfaced travel lanes and two 10-foot stabilized crushed stone shoulders.

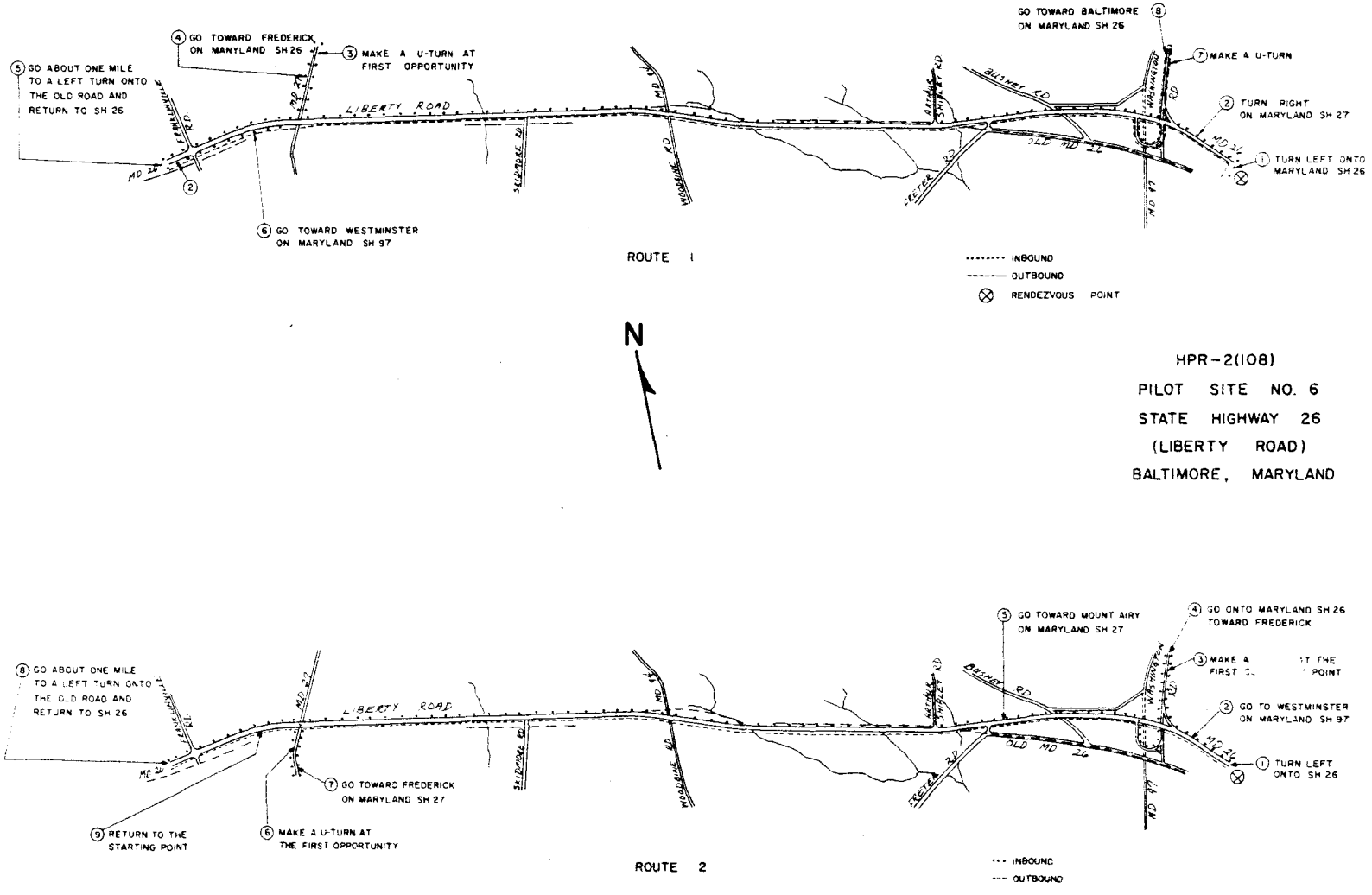
There are three major intersecting roadways along the study section. Two of the intersecting roadways, MD94 and MD27, cross MD26 at-grade while the third, MD97, is a grade separation. The study section is also intersected by numerous county roads and private driveways.

Directional signing is located on the right in all instances.

The 85 percentile speed is approximately 58 miles per hour for eastbound traffic and 55 miles per hour for westbound traffic. The posted speed limit is 50 miles per hour.

The 1967 accident record shows twelve accidents of which two resulted in personal injury and one in a fatality. The fatality was a pedestrian. Of the twelve total accidents; six were angle collisions, two were rear-end collisions, two were sideswipe collisions, and one was a left-the-road accident.

A strip map of the study section is presented in Figure 1.



HPR-2(108)
PILOT SITE NO. 6
STATE HIGHWAY 26
(LIBERTY ROAD)
BALTIMORE, MARYLAND

STRIP MAP OF STUDY SITE 6 INDICATING DRIVING ROUTES
FIGURE 1

DIAGNOSTIC TEAM REVIEW

PILOT SITE NO. 6-MD26, NEAR BALTIMORE, MARYLAND

HPR-2(108)

General

The team review of Pilot Site No. 6 indicated that the design standards of the roadway were most adequate for the speed limit. Negative comments were mainly concerned with the size and location of signing, and the length of "no passing" zones. The team was of the opinion that the study section was very pleasing to drive, especially at the speed limit of 50 mph. Several team members commented that the roadway was conducive to speeds higher than the 50 mph speed limit, with the main limitation to a higher speed being the vertical alignment of the roadway.

Suggested Design Improvements

The majority of the diagnostic team comments were relative to operational improvements.

Should the speed limit on the roadway be increased, the vertical alignment would need to be redesigned. The team also questioned the length of the "no passing" zones used on the study section. It was suggested that the "no passing" zones be reviewed in greater detail and modified, if required, to insure their adequacy.

Suggested Operational Improvements

Signing - Several comments were made by the diagnostic team concerning the directional signing at the MD26-MD97 interchange. The general opinion was that the directional signs were entirely too close to the ramps. Several team members felt that the directional sign on the ramp for eastbound MD26 traffic interchanging with MD97 had been improperly placed. This particular sign was located at the midpoint of the ramp and should, perhaps, be located at the ramp's end. All signing along the study section should be reviewed for location and adequacy of size.

Pavement Markings - Some team members felt that paved shoulders with an edge line should be provided on MD26. However, the team was generally impressed by the good contrast between the traveled-way and the light colored aggregate shoulders.

Delineation - The guardrail along the study section was not delineated. It was recommended that the guardrail section be delineated in some manner. This could be accomplished by placing delineators at the ends of a guardrail section.

Illumination and Glare - At night, the team noted objectionable glare from advertising signs along the study route, even though advertising signs are not

overly abundant. This glare was especially objectionable at the intersection of MD26 and MD27, where MD26 has a slight curve.

General Summary

The most notable feature of this study section was the apparent lack of proper placement of some directional signs. The inadequacy in the size of some of the signs was also noted. Sign placement and sign size along the study section should be reviewed for adequacy.

LIST OF APPENDICES

APPENDIX "A"

DESCRIPTION OF THE STUDY PROCEDURES

The diagnostic evaluation of a study is conducted in four separate phases:

a. Preliminary session
b. Day driving phase
c. Night driving phase
d. Diagnostic team review

The preliminary session is designed to introduce the interdiscipline team to the objectives of the study and to explain the study procedures. The diagnostic questionnaire is presented to the team and discussed with them. The explanation of the questionnaire concentrates on the fact that it is not designed to obtain a particular response from them, but rather it is designed to direct their thinking into a particular area and thus elicit comments which the individual might care to make.

The day phase of the on-site review begins on the afternoon of the first day of the study. The diagnostic team members are transported to the rendezvous point at one end of the study section. Two cars are used in the driver interviews and, upon arrival at the study site, the number one drivers begin their driving runs with the other team members remaining in a car stationed at the rendezvous point. The driver is given instructions well in advance of the required maneuver, and his comments regarding the communication systems provided are recorded on a portable tape recorder. The comments are tied to the roadway through reference markers located at the roadside. The marker numbers are read and recorded on tape as each is passed. After completion of the driving run, the team member moves to an observer position, and the second driver begins his driving run. A different route is driven by the second driver. Errors made during the driving phase are corrected as soon as it is practical to do so. When both the driver and the observer runs are completed, the team member is asked to complete the diagnostic questionnaire on the daylight phase. The process is repeated until all team members have served as a driver and as an observer.

The night phase is conducted in the same manner as the day phase and is held on the evening of the first day of the study.

The morning of the second day of the study is devoted to a team review of the study site. Problem areas are identified, and suggestions regarding possible solutions are discussed. The team is not asked for a consensus of opinion on the improvements which should be made on the study site. Rather, all ideas are explored regardless of how many or how few of the team members might support them.

The comments made on the diagnostic questionnaire and the summaries of the driver interviews are the basis of the Technical Memorandum on the study site, which is the formal report of the opinions expressed by the team.

APPENDIX "B"

SUMMARY OF DIAGNOSTIC QUESTIONNAIRE

PILOT SITE NO. 6 MD26 NEAR BALTIMORE, MARYLAND

Question: Did you, as a driver, lose visual contact with the roadway at a distance less than your desired distance at any point along the vehicle's projected travel-path?

Answer: Yes	No	Comments
	x	
x		Restriction due to highway structures (underpass SH 97), roadway vertical alignment (vertical sight dist. out of balance with other features), and turning roadways (ramps SH 97). The deficiency in vertical alignment may be related to the conviction of many engineers that vertical sight distance should be measured to the road itself rather than to an object 6" high over the crest.
	x	
x		Restriction due to roadway vertical alignment. Vertical curvature not sufficiently outlined by pavement markings (specifically, "no passing" zones are short and inadequate.
x		Restriction due to roadway vertical alignment (various crest verticals).
	x	
x		Restriction due to roadway vertical alignment. Only on those areas where there was restrictive sight distance - usually in areas of yellow "no passing" zones.

Question: How would you evaluate the importance of the view of the road, or lack of it, in the driving task?

/ / Of little importance / / Of some importance / / Relatively Important

/ / Critical problem

Answer: OLI	OSI	RI	CP	Comments
			x	A driver's actions and reactions are in many ways dependent upon his view of the "whole scene." Signing and marking often times is supplemental to good geometric design for information.

Answer:

OLI	OSI	RI	CP	Comments
			x	When related to speed and adverse road driving conditions.
			x	At high speeds you are capable of outdriving your sight distance if not enough information is available thru signing or pavement markings.
		x		Without it the motorist would slow down or delay his decision.
x				With the existing speed limit of 50 mph, the sight distance and view did not complicate my driving task.

Question: Do you, as a driver (observer), feel that the points of divergency from the traffic stream are obvious in time for the normally alert driver to make a smooth, natural transition to the diverging roadway?

Answer: Yes	No	Comments
	x	Generally not - even at the 97 interchange. Notification was conspicuously too little and too late. Geometrics were not of assistance as they were on the urban section.
x		OK for existing speed limitations. If speed limit (or operating speed) is raised, speed change lanes would be too short; advance warning inadequate.
	x	Advance junction warning too close to intersection.
x		Generally so, one entrance where left turn was subject to restrictive sight distance ahead.
	x	Intersecting route numbers and destinations seemed too close to the intersection.
x		It would be better if the informational signs were advanced a few hundred feet.
	x	Because of the curvilinear alignment at location; it was difficult to ascertain points of divergency

Question: Does obscured visibility along the roadway create any noticeable degree of erratic behavior on the part of the driver?

Answer: Yes	No	Comments
	x	
	x	
	x	
	x	
	x	
x		But I did not notice any obscured visibility.
x		Could tend to cause uncertainty as to traffic in the opposite direction. This existed in cut section and in curvilinear alignment.

Question: Does the driver appear to have difficulty in maintaining the vehicle within the lane (i.e., does he tend to encroach on adjacent lanes)?

Answer: Yes	Not to any marked degree	Comments
	x	Though the lack of paved shoulders caused a tendency to shy toward the centerline.
	x	
	x	
	x	
	x	
	x	
	x	

Question: Is the normal traveled-way clearly delineated for parking and emergency stopping areas?

Answer: Yes	No	Comments
x		
x		
x		
x		

Answer:	Yes	No	Comments
	x		
	x		
	x		

Question: Does there appear to be substantial amount of vehicle encroachment on the parking area?

Answer:	Yes	No	Comments
		x	
		x	Unsurfaced shoulders had numerous tire marks but presumably caused by legitimate parking. Demonstrates need for Des. Engrs., & Maintenance Engrs. to jointly justify surface snow soil (?).
		x	
		x	
	x		There were signs of many tire imprints on the unsurfaced shoulders. Also, there was a slight dropoff adjacent to the pavement edge.
		x	
		x	Not noticed on trip.

Question: Are the roadside hazards (bridge abutments, piers, guardrails, sign supports, etc.) removed a sufficient distance from the traveled-way to insure reasonable safety? If "No," is the hazard visible for a sufficient distance to prevent the drivers being startled by it?

Answer:	Yes	No	Comments
	x		
		x	One or two narrow bridges, unanchored guard-rails, steep side slopes, & signs do not conform to presently accepted standards. This study should pursue validity of present standards.

Answer:	Yes	No	Comments
		x	Yes. The one bridge was not shoulder width, however, it was clearly marked especially at night.
		x	The bridge hazards are marked and normally OK, but emergency situations could arise to make them dangerous.
	x		

Question: What do you feel is a minimum safe distance from the outside edge of the shoulder to an obstruction? _____ feet?

Answer:	Comments
	15 ft., 25 ft. desirable minimum ± 20' in most cases.
	15 ft.
	Quite some feet.
	20' but not possible on this design.

Question: Does the horizontal alignment along the desired path of travel (particularly reverse curvature) require an excessive amount of driver concentration and thus increase the hazard of other roadway appurtenances?

Answer:	Yes	No	Possibly	Comments
		x		
		x		My experience on this project as an observer was, of course, related to my observation of the NW sector of the Washington.
		x		
		x		Expect to see delineation on the outside of the curve. Imperative in adverse weather condition and also during the night hours.
		x		Not on this route.
		x	x	
	x			Reverse curves particularly in cut sections definitely affect driver concentration in this area.

DIRECTIONAL CONTROL

Question: Is there sufficient advance notification of diverging roadways or turn lanes under light to moderate traffic conditions?

Answer: Yes	No	Comments
x		
	x	Signing too little and too late.
	x	
	x	Not enough advance signing for major intersection.
	x	
x		Distances should be increased.
	x	Signing too close to diverging roadways.

Question: Is there sufficient advance notification of diverging roadways or turn lanes under heavy traffic conditions (i.e., limited lane change capability)?

Answer: Yes	No	Probably	Comments
	x		We didn't experience heavy traffic conditions, though the answer would be usually no.
			Not observed under heavy traffic conditions.
	x		
			Not applicable,
	x		Did not experience this condition.
x			
	x		

Question: Where lane assignments are indicated, are the assignments clear and easily understood?

Answer: Yes	No	Comments
		No comment,
		Not applicable, except possibly at intersections where speed change lanes are inadequate.

Answer:	Yes	No	Comments
	x		Generally.
			Not applicable.
	x		
			No comment.
			None observed as I recall.

Question: Do the existing lane assignments result in an unnecessary lane change (i.e., indicate a change to another lane when both lanes continue in the desired direction)?

Answer:	Yes	No	Comments
			No comment.
			Not applicable.
		x	
			Not applicable.
		x	
			No comment.
			Nonexistent.

Question: Is the exit ramp, turning roadway or turn lane clearly identified and outlined?

Answer:	Yes	No	Comments
		x	Generally not at 97; edge line would help, as well as larger signs.
	x		
	x		
	x		
		x	It was sometimes difficult to identify exactly where to turn on intersecting roadways and ramps.

Answer:	Yes	No	Comments
	x		Advance the information and deceleration lanes.
		x	Suggest point or delineators contrast is more evident in daylight than darkness, however.

Question: When advisory speeds are posted, are they reasonable in light of the downstream geometric and traffic conditions?

Answer:	Yes	No	Comments
			No comment.
	x		
	x		
			Too small for the posted speed limit. I don't remember seeing any advisory speeds.
	x		
	x		
	x		

Question: Are the directional sign messages clear and concise so as to minimize the possibility of driver confusion?

Answer:	Yes	No	Comments
	x		Generally,
	x		
	x		
	x		Advance information more desirable.
		x	Especially at the ramp connection to State Route 97. The directional sign message was clear; however, the sign was mislocated.
			The locations could be improved.
		x	Legend too small except in several cases and too close to point of intersections.

OPERATIONAL CONTROL

Question: In your opinion, is the sight distance of right-of-way control devices (signals, "STOP SIGNS," etc.):

/___/ Adequate /___/ Questionable /___/ Inadequate /___/Critical

Answer:	A	Q	I	C	Comments
	x				
	x				
	x				
		x			Could be increased in many points.
	x				
	x				
	x				

Question: Are the control devices located in positions where they are readily apparent to a normally alert driver? (Answer: Yes, Possibly, Poorly Located)

Answer:	Yes	Poss.	PL	Comments
			x	Too close generally.
	x			
	x			
		x		
	x			
	x			
			x	Insofar as distance from the intersection is concerned - should give motorist more lead time for his decision.

Question: Is there sufficient advance warning of devices which are not readily apparent?

Answer:	Yes	No	Comments
		x	
	x		Possible exception: For traffic approaching or already exited from prog. at interchanges (SH 97).
	x		
		x	Speed lanes and changes too abrupt i.e., from 50 to 30 mph.
	x		When talking about signals and regulatory signs however, as previously stated, the advance signing for X roads was poor. Also route shields were extremely small.
		x	I doubt that the motorist understands what the warnings are for.
		x	As previously stated.

Question: Are the required speed changes accomplished in a manner which minimizes driver alarm and discourages rapid deceleration?

Answer:	Yes	No	Comments
	x		Generally so.
		x	Speed change lanes too short. Use of greater length of turf shoulder would have helped.
	x		
		x	
	x		
	x		
	x		

Question: Are adequate speed change areas provided so as to eliminate the need for a substantial speed reduction in the through traffic lanes?

/__/Always /__/Usually /__/ On occasion /__/ Seldom

Answer:	A	U	OO	S	Comments
			x		
		x			
			x		Especially for right or left turn into X-roads there are no speed change areas.
	x				
		x			

Question: Could sign and/or signal standards be relocated so as to reduce the associated accident potential and still retain an acceptable degree of effectiveness? (Answer: Yes, Possibly, Probably Not)

Answer:	Yes	Poss.	PN	Comments
	x			
	x			
			x	
			x	
	x			More distance from the X-road.
	x			Signs could be advanced.
		x		
		x		

Question: Where hazard warnings are provided, can they easily be associated with the hazard involved? (Answer: Yes, In Some Cases, No)

Answer:	Yes	ISC	No	Comments
		x		
	x			Exceptions: There were no hazard warnings on one or two narrow bridges; steep side slopes ditch section. However, such markings not commonly used by most states.

Answer:	Yes	ISC	No	Comments
		x		Some intersections were not readily apparent.
			x	Pavement marking incorrect.
	x			
	x			
	x			

Question: Are warnings provided for hazards which are obvious and for which little, if any, warning is actually required? (Answer: Yes; In a Few Cases; No)

Answer:	Yes	IFC	No	Comments
		x		
			x	
				No answer.
				Possibly, however, I cannot think of any.
	x			
			x	

Question: In your opinion, is there a question as to which traffic stream a right-of-way control device applies?

Answer:	Yes	No	Comments
		x	
		x	
		x	
		x	
		x	
		x	
		x	

GENERAL INFORMATION

Question: Does there appear to be an excessive amount of informational signing within the right-of-way?

Answer: Yes	No	Possibly	Comments
	x		
	x		
	x		
		x	At some intersections where roadside development exists.
	x		Other than the advertising signs.
	x		
	x		

Question: Is the informational signing provided of real value to a majority of the traffic?

Answer: Yes	No	Possibly	Comments
x			
		x	
z			
		x	
			I doubt it, since most of the traffic is probably acquainted with the route.
x			
x			

Question: In your opinion, the roadside advertising on this section competed with the traffic control devices for the driver's attention to:

/__/A marked degree /__/Some degree /__/A limited degree /__/A very limited degree, if at all

Answers: MD	SD	LD	VLD	Comments
			x	
			x	OK in daytime; see night comments.
		x		Some competition with highway signing.
			x	
			x	Except for the used car lot on the south side of Route 26.
			x	It all depends on the motorist.
	x			Noticeable more at night, however, because of lighting.

Question: Are the points of divergency from the traffic stream obvious to the normally alert driver a sufficient time in advance of the necessary maneuver such that a smooth, natural transition to the diverging roadway is possible?

Answer: Yes	No	Comments
x		Poor at 97.
x		Except for the ramp connection at State Route 97.
	x	Generally none, except in the case of the 97 interchange. The geometrics of the interchange helped to delineate the correct paths, but the signing was generally too little too late.
x		However, I would suggest that at the junction of MD97 and MD26 better delineation in the form of edge markings be provided. The throat could be opened for easier accessibility and ease of turn.
	x	I found that at the junction, advance warning assemblies were too close to the point of divergencies.

Answer: Yes	No	Comments
x		Signs could be advanced a little more, and cardinal indications are necessary.
x		For this project general comment: Final questionnaire should correlate decision to diverge with headlight limitations and possibly with outside or fixed illumination.

Question: Is the normal traveled-way clearly delineated from the parking and/or emergency stopping areas?

Answer: Yes	No	Comments
x		Wide open!
x		The contrast of pavement and gravel shoulder was good, however, I would personally like to see the solid white edge line used out here.
x		On a clear night in December without edge lines, this would be doubtful in any kind of inclement weather.
x		
x		I was favorably impressed with the pavement marking and the color contrast of the untreated shoulder.
x		
x		

Question: Are the roadside hazards visible for a sufficient distance to prevent the driver's being startled by them?

Answer: Yes	No	Comments
x		
x		
x		The closer hazards - save the Bridge at 97 - were not delineated, however.

Answer:	Yes	No	Comments
	x		
	x		
	x		
		x	It was observed that nearly all potential roadside hazards were never visible at night, thereby lessening the "startle effect" as compared today time operations.

Question: Does the existing delineation provide a clear and distinct outline of the roadway ahead?

Answer:	Yes	No	Comments
	x		
	x		However, the centerline point and the yellow stripes were fading out in some areas.
		x	Only as provided by contrasting shoulder, side slopes, and adjacent development and advertising signs.
	x		
	x		What delineation was necessary was there, but I think a higher standard of reflection could be used.
	x		
	x		Within the limitations of headlights. Perhaps this question should attempt to correlate headlight and sight distribution for designated speed.

Question: Is the illumination provided by the vehicle's headlights sufficient for safe operation on the facility?

Answer:	Yes	No	Comments
	x		

Answer: Yes	No	Comments
x		
x		
x		At the posted speed of 50 mph.
x		
x		
x		
x		
	x	It is this observer's opinion that low beam headlights are unsafe for night driving. Also, guardrail not fully visible at night.

Question: Does the glare from opposing headlights obscure the driver's view of the roadway ahead?

/__/Probably /__/Possibly /__/Not to any marked degree

Answer: Prob.	Poss.	NMD	Comments
	x		I did think this was minor in my case, however, I am sure that some people are bothered to a great degree.
		x	
		x	
		x	
		x	
	x		
x			

Question: Is there sufficient advance notification of diverging roadways or turn lanes?

Answer: Yes	No	Comments
		No comment.
x		However, the State route shields should possibly be larger.

Answer:	Yes	No	Comments
	x		But not of sufficient distance or with sufficient allowance for response time.
		x	I feel the advance guide and directional signs could be "advanced" a little more even at the 50 mph speed limit provided easier turns, etc.
	x		
	x		Should be advanced more.
	x		Generally.

Question: Can the existing directional signs be easily read at a glance?

Answer:	Yes	No	Comments
	x		
	x		
	x		Except that they are generally too close together.
		x	The legend could be increased in size to provide more target value and legibility.
		x	Some were quite effective while others were either small in character or "tired."
	x		
	x		

Question: Is the existing lane delineation adequate?

Answer:	Yes	No	Comments
	x		But more time could be spent in placement of the lines.
	x		However, it could be better with repainting and yellow stripes in some locations and the placing of edge lines.

Answer:	Yes	No	Comments
	x		
	x		
	x		
			Edge lines would improve delineations.
	x		

Does the glare from opposing headlights make it difficult to read roadside and/or overhead signs?

Answer:	Yes	No	Comments
		x	
		x	
		x	
	x		However, this project compares favorably with others in this respect.

OPERATIONAL CONTROL

Question: In your opinion, is the sight distance to right-of-way control devices at night?

/___/Adequate /___/Questionable /___/Inadequate /___/Critical

Answer:	A	Q	I	C	Comments
	x				
	x				
		x			Not within cone of vision on MD 27 approaching; also, too many other signs conflicted on this approach. Elsewhere, appeared adequate.

Answer:	A	Q	I	C	Comments
	x				
	x				
	x				
	x				

Question: Where hazard warnings are provided, can they be easily associated with the hazard involved?

Answer:	Yes	No	Comments
	x		
		x	In the darkness many of the hazards are not visible.
	x		However, some appeared to be a little too close to the hazard.
	x		
	x		
	x		Some side roads and/or crossroads were not easily discernable.
	x		
	x		

Question: Do signs and lights outside the right-of-way detract to a marked degree from the effectiveness of traffic control devices?

Answer:	Yes	No	Comments
		x	
		x	However, the used car lot on the south side of Route 26 was very distracting, but it was fortunate that there were no major decisions required at this location.
		x	

Answer:	Yes	No	Comments
		x	
	x		Roadside businesses, particularly a used car lot, almost totally obscured both the road ahead and most traffic control devices.
		x	

APPENDIX "C"

SUMMARY OF TECHNICAL DRIVER INTERVIEWS

PILOT SITE NO. 6 MD26 NEAR BALTIMORE, MARYLAND

GEOMETRIC DESIGN

DAY PHASE

I would feel uncomfortable going into the ditch.

The deep ditch and back slope are a hazard.

Geometrics are much more critical in day as opposed to night.

I do not like this kind of shoulder and an edge line.

There is good sight distance at the end of this ramp (turn onto MD97 from MD26).

There is a short sight distance on this off-ramp (MD26 onto MD97 Northbound).

Even though there is good sight distance, I get the feeling that I can't see enough of the road ahead.

The alignment is good except for the vertical alignment.

There are a very few bridges on this route, but all of them have curbs within 2 or 3 feet of the roadway.

NIGHT PHASE

I tend to shy away from the high curb (ramp from MD26 to MD97 Northbound).

The drop-off between the pavement and shoulder is too great.

This roadway seems to be a little narrow and deep cross the MD97 structure.

These side ditches are too narrow and deep.

The steel mile posts on the roadside are a hazard.

This is a good wide roadbed.

That is a rough drop onto the shoulder.

There is good alignment and grade on this road.

This roadway is conducive to a higher speed than 50 mph.

SIGNING

DAY PHASE

This junction sign is too close to the intersection (MD27 intersection).

The route markers are too small.

All of the junction and directional signs are too close to the intersection.

NIGHT PHASE

For the turn onto SH97 to Westminister, the sign gave Westminister but not MD97.

The state route marker for SH26 is too close to the ramp and has no designation for MD26 E or MD26 W (MD97 to MD26).

SIGNING

DAY PHASE

A larger junction sign is needed here (MD97 to MD26).

East-west directional sign is needed here (MD97 to MD26).

The advance marker for the junction is too close and the legend is too small (MD26 to MD27).

NIGHT PHASE

The "MT AIRY" sign should be moved back more from the intersection.

The snow emergency route marker needs to be reflectorized.

The route marker is too small (MD26 to MD97).

The sign at the nose for MD26 is not effective; directional markers would be helpful (MD97 to MD26 Eastbound).

DELINEATION

DAY PHASE

NIGHT PHASE

Delineators on the outside of the curves would be helpful.

They need more delineation on the cable guardrail.

The ends of the bridge do not reflect good.

The gravel shoulders are weak but give good delineation.

PAVEMENT MARKINGS

DAY PHASE

That short "no passing" zone line should not be there (MD26 Eastbound just past MD27 intersection).

NIGHT PHASE

Edge lines would be of some value.

Edge lines would be effective regardless of contrast of shoulder.

An edge line is not needed because of good contrast of shoulder.

Pavement line does not show up good on this bridge.

Centerline stripe looks good.

Centerline is not too visible at this point (on MD26 just East of MD27).

MISCELLANEOUS COMMENTS

DAY PHASE

At 50 mph, the road is extremely easy to drive.

Very pleasing road, the design exceeds the maximum speed limit.

50 mph speed is too slow for this type facility.

NIGHT PHASE

Passing zones at certain points were too short.

This short road seems to be designed for a higher speed.