Summary of Intersection Evaluation
MD 4 at Briscoes Turn Road/Skinners Turn Road

March 2008

An intersection evaluation has been conduced to determine the traffic operations at the intersection of MD 4 and Briscoes Turn Road/Skinners Turn Road in Calvert County, Maryland. As part of this evaluation, a traffic signal warrant evaluation was conducted.

A traffic signal warrant evaluation determines whether or not a traffic signal is justified. For traffic signal analysis, we use criteria set forth by the nationally accepted **Manual on Uniform Traffic Control Devices** as our guide. The manual indicates whether traffic signal control should be considered if certain conditions exist. The evaluation takes into account many factors, such as traffic volumes along all approaches, vehicular speeds, intersection geometrics, pedestrian activity, and accident history. Overall, our analysis concluded that conversion from the existing Intersection Control Beacon (ICB) to a full color traffic signal is not justified at this time.

To improve the traffic operations at this intersection, we are currently in the design phase of the installation of channelization on Briscoes Turn Road which would restrict left turn and through access to northbound MD 4 and Skinners Turn Road, respectively. Traffic from Briscoes Turn Road wishing to access northbound MD 4 or Skinners Turn Road would use either the existing alternative route via the signalized MD 4 and MD 262 intersection or the available crossovers on southbound MD 4 (located approximately 1200 and 3300 feet south of the subject intersection).

For information regarding the current Young Driver Laws and statistical information, please visit the Maryland State Highway Administration's (MD SHA) "Young Driver Safety" website at http://shawww2/safety/younger_driving.asp. Additional safety information and statistics may be found on the MD SHA's "Safety" website at http://shawww2/safety/safety.asp.

MD 4 and Briscoes Turn Road/Skinners Turn Road

Calvert County

February 7, 2008

Site Characteristics

The intersection of MD 4 (Southern Maryland Boulevard) and Briscoes Turn Road/Skinners Turn Road is located in Calvert County, Maryland. *Refer to Figure 1: Site Location Map.* MD 4 is classified as an Urban Principal Arterial and is a four lane divided highway which includes left and right turn lanes in both the northbound and southbound directions. The posted speed limit along MD 4 is 55 MPH. Briscoes Turn Road is a two lane undivided roadway with a single lane approach to the intersection. This single lane functions as a left, through, and right turn lane. Skinners Turn Road is a two lane undivided roadway with a two lane approach to the intersection. It operates as a shared through/left turn lane and a separate right turn lane.

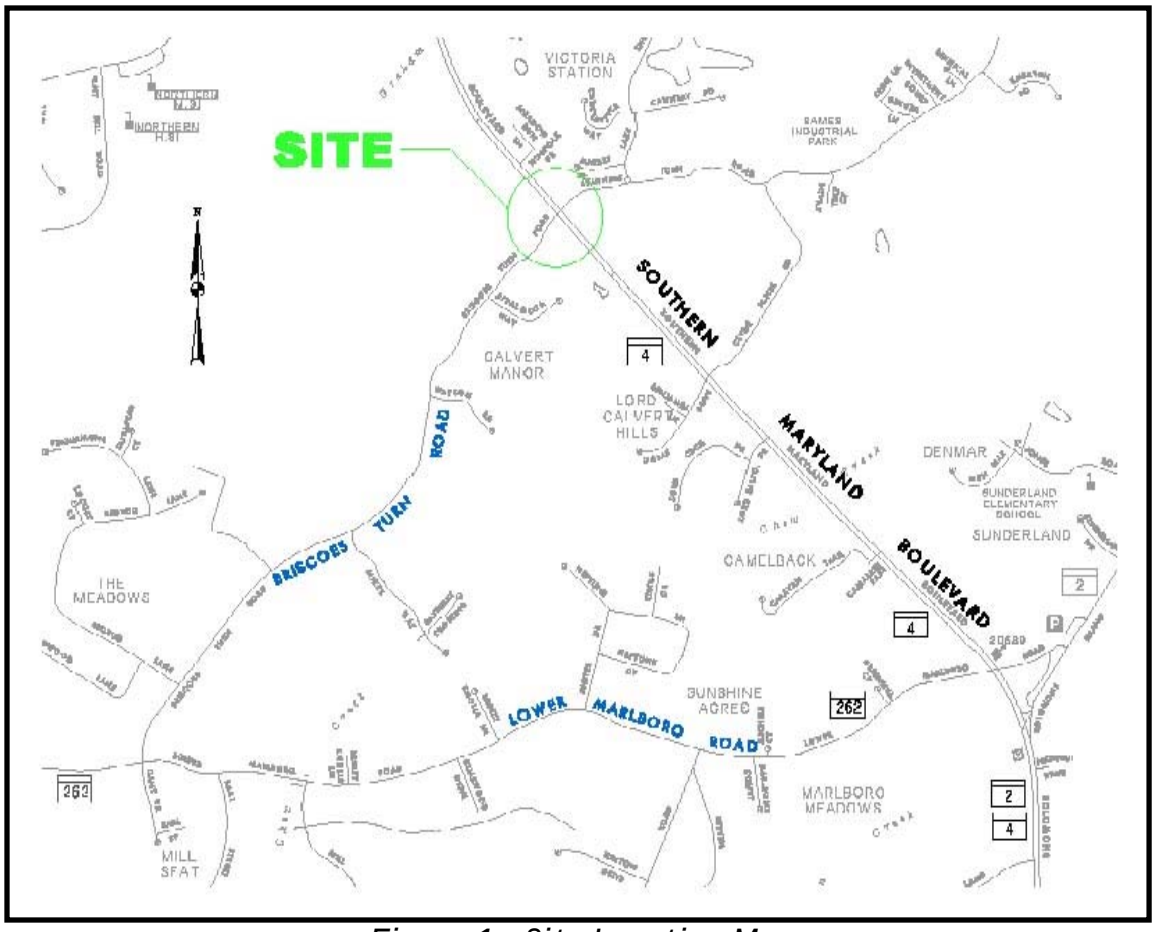

Figure 1: Site Location Map

Site Characteristics (Cont.)

Currently the intersection is controlled with an Intersection Control Beacon (ICB). It includes flashing yellow lights along MD 4 and flashing red lights along the side street approaches, supplemented with standard Stop signs. In addition, there are advanced intersection warning signs along northbound and southbound MD 4 including street name panels. *Figure 2: Existing MD 4 and Briscoes Turn Road/Skinners Turn Road* shows a detailed sketch of the existing intersection.

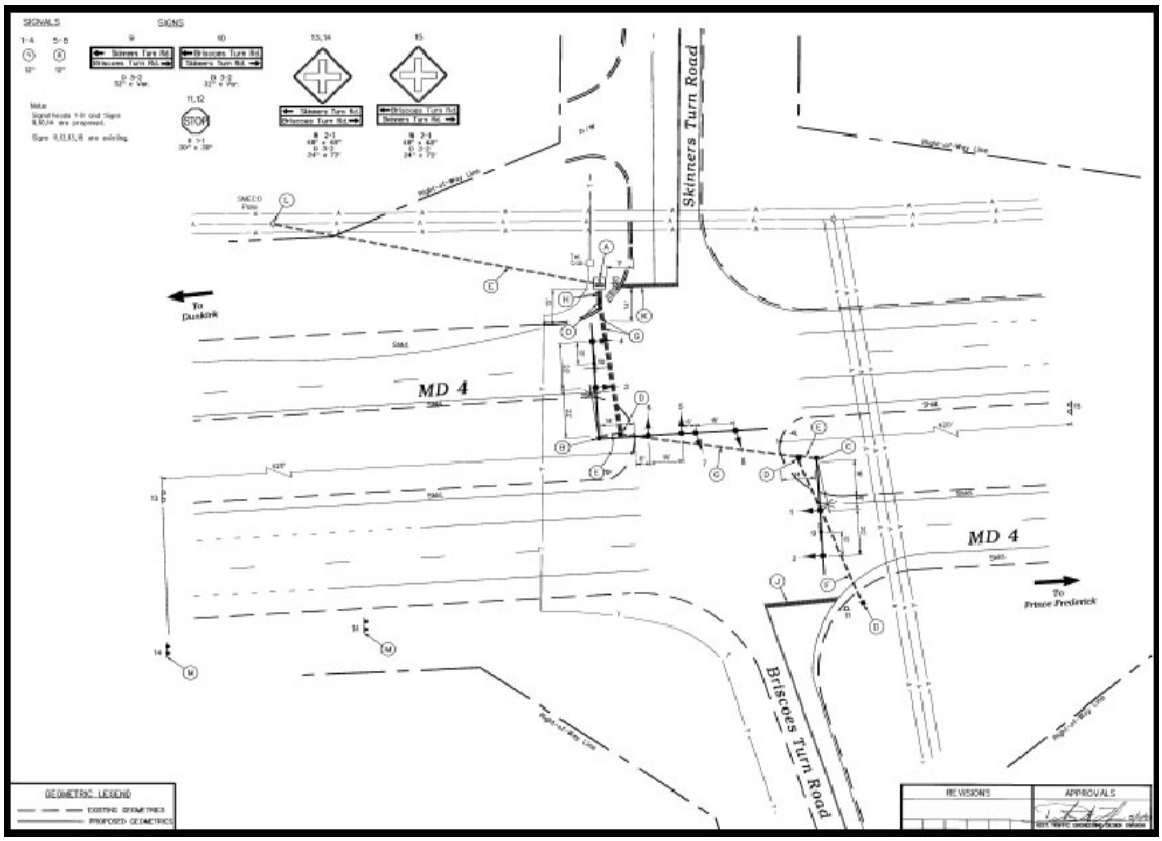

Figure 2: Existing MD 4 and Briscoes Turn Road/Skinners Turn Road

Data Collection

A traffic volume turning movement count was performed in December 2007. Turning movement counts are performed on a typical weekday for a 13-hour period to ensure that typical morning and evening commuting volumes are captured along with typical activity throughout the day. The results are tabulated for each 15 minute period throughout the day and each movement at the intersection is broken out. For example, from 6:45 a.m. to 7:00 a.m., the count shows how many vehicles along southbound MD 4 turned left, how many continued straight through the intersection, and how many turned right. Likewise, it indicates how many vehicles along Skinners Turn Road turned left, how many continued straight across, and how many turned right. Each movement is quantified in this manner. The traffic count provides the data necessary to perform various calculations and analyses—such as a Signal Warrant Analysis and Level of Service (LOS) computation. The results of the traffic count indicate that the morning peak hour occurs between 6:45 a.m. and 7:45 a.m. and the evening peak hour occurs between 4:30 p.m. and 5:30 p.m. The peak hours indicate periods of highest traffic volumes and typically correspond to peak commuting times.

The LOS is an indicator of traffic flow conditions which is calculated using peak hour volumes. The LOS of an intersection is indicated with letters 'A' through 'F', with 'A' being associated with free flow conditions with minimal delay and 'F' being associated with significant delays and congestion. The traffic count data indicates this intersection operates with an overall LOS 'C', during both the morning and evening peak hours.

Observations

To gain a better understanding of the intersection operation, field observations were conducted which included the morning and evening peak hours. Observations are conducted during peak hours as they provide the best opportunity to observe the intersection operation during high-traffic demands.

During the morning and evening observations, traffic along MD 4 moved through the intersection in platoons (vehicles grouped together with defined gaps between the groups). Left turns from Briscoes Turn Road and right turns from Skinners Turn Road were the predominant side street movements during the morning peak period.

Observed vehicle queues along Skinners Turn Road were infrequent and were associated with minimal delay and thus cleared quickly, whereas queues along Briscoes Turn Road approach reached up to six vehicles with delays nearing sixty seconds. This delay resulted in some vehicles choosing relatively small gaps in southbound MD 4 traffic to access the median. Multiple vehicles from the Briscoes Turn approach were observed in the median area at the same time along with vehicles from the remaining approaches which appeared to result in driver confusion at times. *Refer to Photo A: Median Operation.* In the photo, there is a queue of vehicles waiting (on the far side of the intersection) along Briscoes Turn Road. The photo shows two of these vehicles in the median along with an SUV from the Skinners Turn Road side. In addition, a minivan along southbound MD 4 is waiting to turn left onto Skinners Turn Road. Please note that, in this case, the minivan actually has the right-of-way because mainline vehicles have the right-of-way over side street vehicles.

Photo A: Median Operation

Safety Analysis

Police reported incidents from all police jurisdictions are housed in a central database maintained by the SHA. The latest available three-year incident data was considered to evaluate the overall intersection performance over an established time period. The data shows a decrease in the number of incidents over the three-year period.

Safety Analysis (Cont.)

The data identified eleven incidents over the three-year time period, seven angle, one left turn, and three rear end incidents. The incident history also revealed that six out of the seven angle collisions involved vehicles originating from Briscoes Turn Road.

Signal Warrant Analysis

A traffic signal warrant evaluation was conducted to determine if a conversion from the existing Intersection Control Beacon (ICB) to a full traffic signal control is justified. For the traffic signal analysis, for reasons of safety, we are mandated to use criteria set forth by the nationally accepted **Manual on Uniform Traffic Control Devices** as our guide. The manual indicates whether traffic signal control should be considered if certain conditions exist. The evaluation takes into account many factors, such as traffic volumes along all approaches, vehicular speeds, intersection geometrics, pedestrian activity, and accident history. The study results indicate that none of the signal warrants were met. The study indicates that the ICB, which is already in operation, continues to be appropriate for the traffic operations at this intersection. As a result of the above, a full color traffic signal is not justified at this time.

Primary Operational Concerns

The primary traffic operational concerns were identified as follows:

- Delay as a result of queuing along the Briscoes Turn Road approach during peak hours.
- Multiple vehicles queuing in the median resulting in driver confusion.
- A pattern of incidents associated with Briscoes Turn Road.

Findings

As a result of the above, it is determined that the appropriate measure to address the primary operational issues is to restrict the left turn and through movements from the Briscoes Turn Road approach thereby allowing for right turns only. *Refer to Figure 3: Proposed Briscoes Turn Road Channelization.*

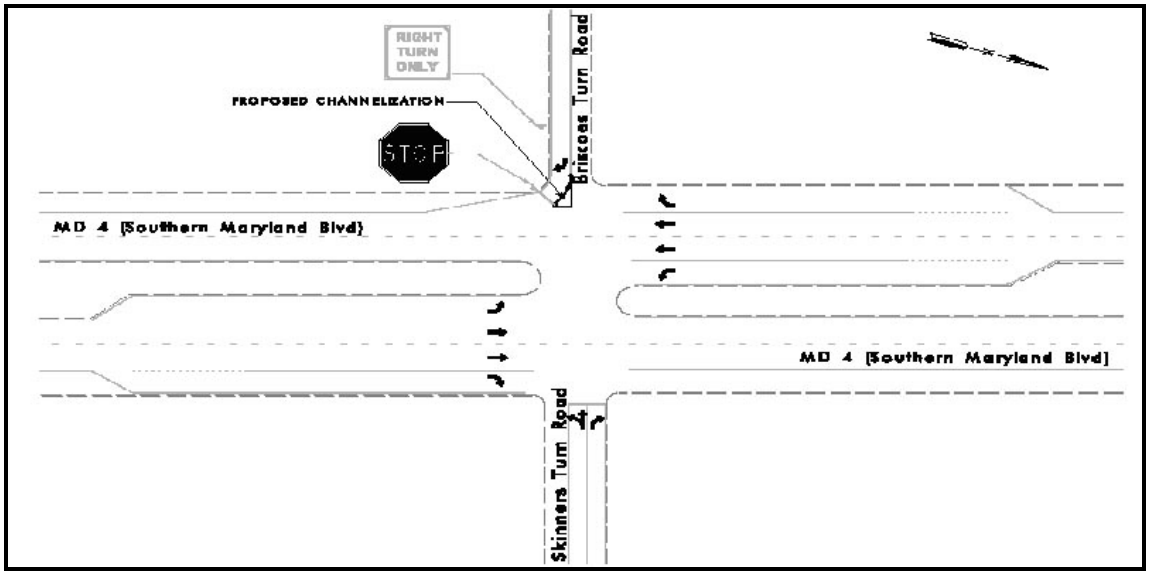

Figure 3: Proposed Briscoes Turn Road Channelization

Access from Briscoes Turn Road to Northbound MD 4 or Skinners Turn Road will be directed via Briscoes Turn Road to MD 262 (Lower Marlboro Road) in order to utilize the existing full color traffic signal at the intersection of MD 4 and MD 262 as shown in Figure 4.

Findings (Cont.)

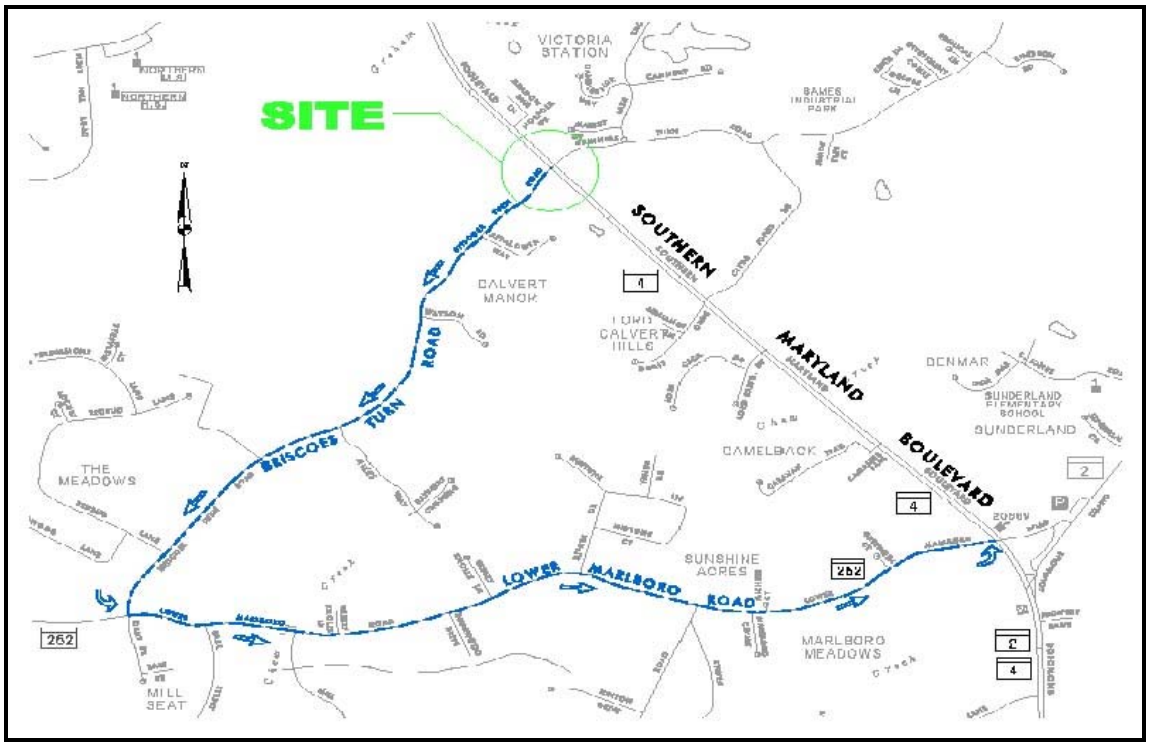

Figure 4: Access via MD 262

Alternately, motorists may choose to turn right from Briscoes Turn Road onto southbound MD 4 and then U-turn at one of the crossovers to the south as shown in Figure 5. These crossovers are located 1200 feet and 3250 feet from the intersection. The sight distance is found to be adequate at both crossovers.

Findings (Cont.)

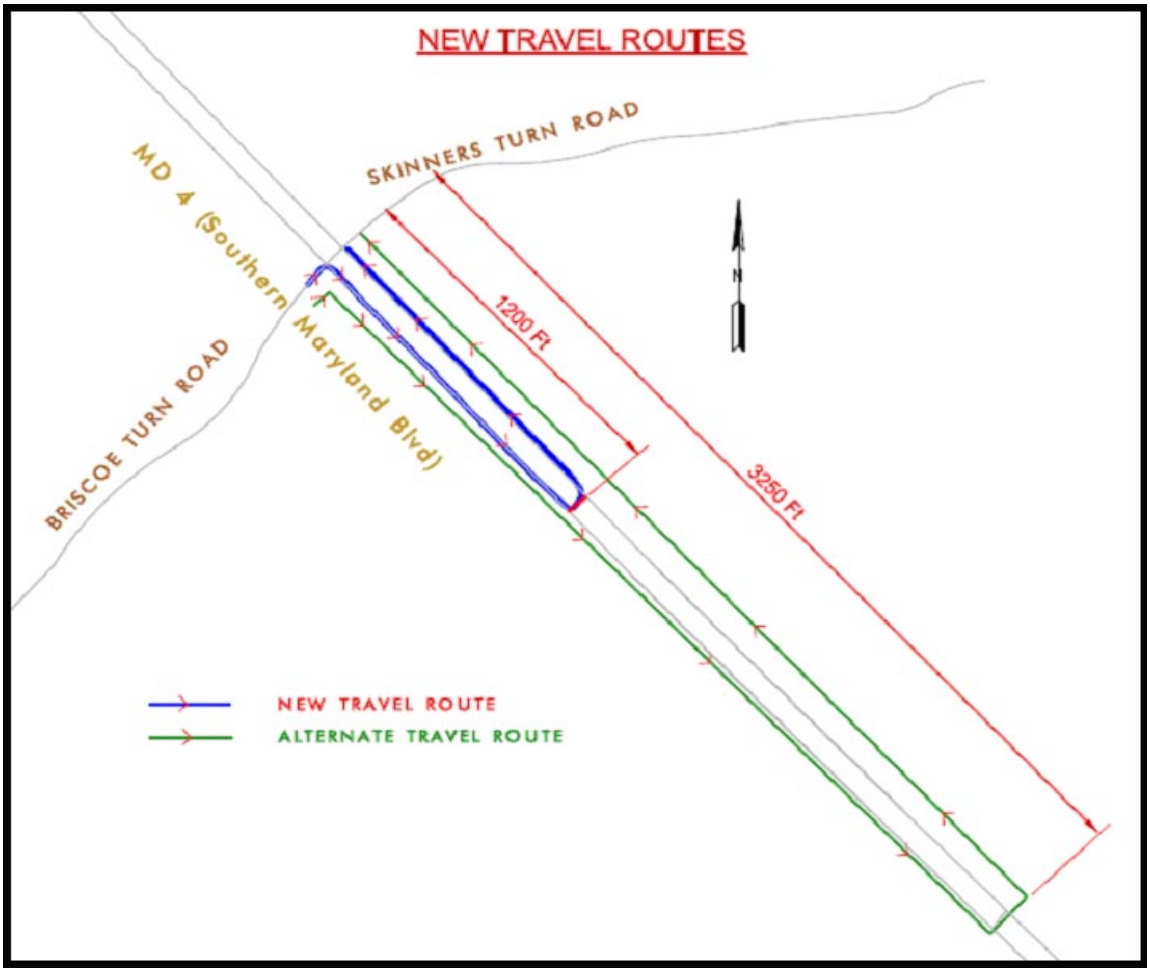

Figure 5: U-Turns along MD 4

Conclusions:

The field observations confirm the traffic count data which indicates that the overall intersection operates at an acceptable Level of Service 'C'. While to some there may appear to be significant queuing and delay along Briscoes Turn Road during the peak hour, such queuing and delay is typical for intersections with similar characteristics.

However, peak hour median queuing resulting in driver confusion and the prevalence of small gap selection by vehicles accessing the median from Briscoes Turn access is an operational concern. Crash data supports this analysis as detailed above. Therefore, restriction of the turning movements at the Briscoes Turn Road to right turn only will alleviate the operational concerns.