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April 20, 2010

Mr. Tom Fahrney
Virginia Department of Transportation
14685 Avion Parkway
Chantilly, VA 20151

Subject: Analysis of BRAC-133 Short-Term Improvements

Dear Mr. Fahrney:

As we discussed during our meeting on April 9, 2010, one of the next steps in the analysis of transportation improvements for the BRAC-133 project is to conduct detailed operational analysis of short-term improvements. As we discussed during our April 9 meeting, the short-term improvements to be analyzed are primarily those developed by the BRAC-133 Advisory Committee. The attached document summarizes the short-term improvements proposed by the BRAC-133 Advisory Committee and City of Alexandria staff initial responses to the proposed improvements. Please note that the final decisions on which short-term improvements to implement should be based on the results of the detailed comprehensive operational analysis of the proposed improvements.

During the April 9, 2010 meeting, you indicated that funding for the analysis of short-term improvements needs to be identified by the City of Alexandria. We are currently working in identifying potential funding sources for the analysis of short-term improvements and hope to have the funding in place within the next few weeks.

As we discussed during our meeting, it is important to also identify potential funding sources to develop 30% design plans for the improvements that are recommended for implementation after the detailed operational analysis. We have begun assessing potential funding sources for the development of the 30% plans. However, we believe that we need to treat the operational analysis and the development of the 30% plans as two different projects as they may be funded through different funding sources.

Please review the BRAC-133 Advisory Committee list of proposed improvements and the City of Alexandria initial responses. Please call me or e-mail me if you have any questions or comments with respect to the material included in the attachment.

Sincerely,

Abraham Lerner W.

Abraham Lerner
Deputy Director of Transportation and Environmental Services

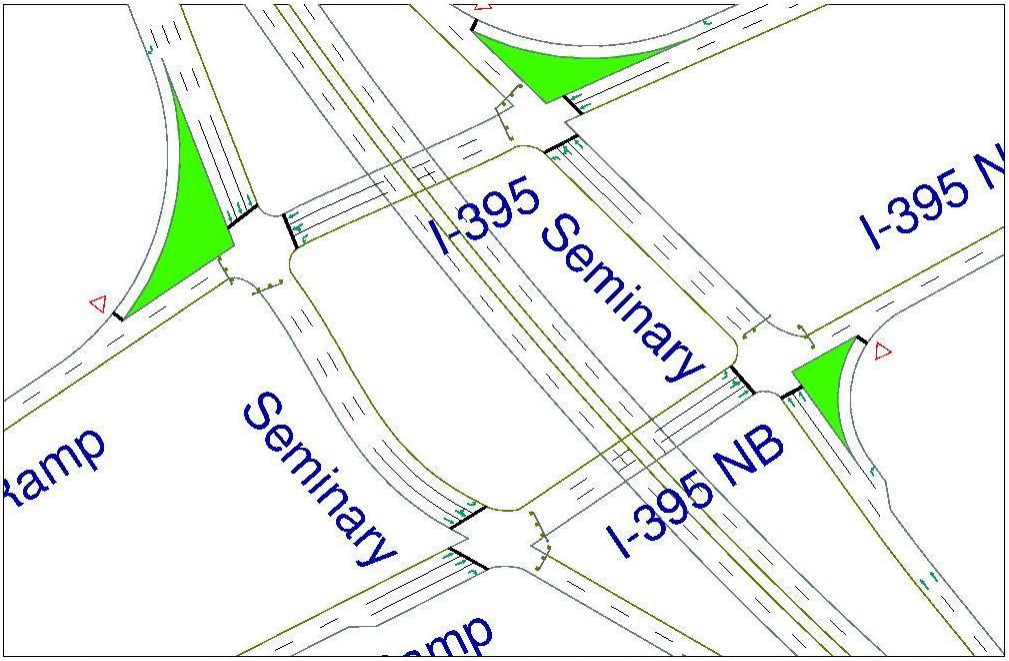
Enclosure: BRAC-133 Short and Mid-Term Improvements Revised April 20, 2010

cc: Dave Dexter, BRAC-133
Rich Baier, Director, Transportation and Environmental Services
Pat Escher, Planning and Zoning

BRAC-133 SHORT AND MID-TERM IMPROVEMENTS
REVISED APRIL 20, 2010

1. Reconfigure the middle level of the Seminary Road interchange to create a spiral round-about configuration that maximizes capacity.
   Response: The Seminary Road interchange is owned and operated by the Virginia Department of Transportation (VDOT). Any discussions related to proposed modifications would need to be thoroughly evaluated and approved by VDOT.

   a. Stripe three lane approaches to each signal within the interchange. For each set of three lanes, the right is through, the center a choice (thru, left) and the left is left only. The two lanes which can turn left are then directed by "cat tracks" to the rightmost two lanes of the next approach within the interchange.
      Response: This proposal would add additional approach lanes to the northeast and northwest signals. City staff believes this proposal will improve traffic flow. VDOT is proposing to conduct a detailed operational analysis of this and other short-term operational improvements. City staff agrees that a detailed operational assessment should be conducted to assess the adequacy of implementing this improvement.



b. The approach lanes to each signal from the ramps would have to be two through lanes "cat tracked" to feed traffic into the center and left lanes of the next internal leg of the interchange, thus lining the traffic up into the lanes from which they can turn left at the far signal.
Response: Agreed.

c. Reconfigure the northbound off-ramp from I-395 to provide a right only lane and two through lanes which are cat tracked as described above. The other approaches will have at least three lanes, which channelized right-turn lanes on the eastbound, southbound, and westbound legs.
Response: Agreed, there appears to be enough space to implement this improvement. VDOT is proposing to conduct a detailed operational analysis of this and other short-term operational improvements. City staff agrees that a detailed operational assessment should be conducted to assess the adequacy of implementing this improvement. This proposal will likely improve the Level of Service at the NB off ramp intersection, under a scenario which includes BRAC

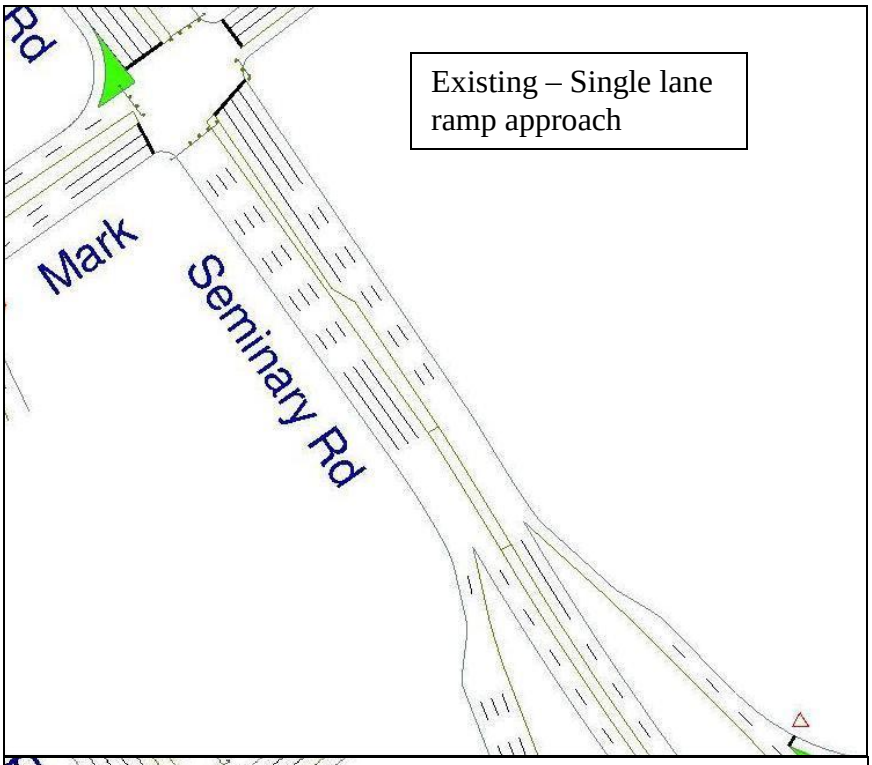
d. These improvements will require the elimination of the island which prevents two lanes from turning left within the "traffic circle" to go westbound from the northbound off ramp.
Response: Agreed. This work will most likely require the relocation of a street light.

e. Retime the traffic signals within this level of the interchange to eliminate the lost time for traffic entering the interchange from the ramps. Currently, each ramp approach into the interchange gets the green when the far signal directly in front of it also gets the green. The inside legs are universally empty, and traffic loses at least 10 seconds of saturation flow to cross the empty legs. If the signals were better timed, the approach ramp signal would turn green prior to the internal leg turning green, allowing traffic to enter and nearly fill that leg (without having to stop), eliminating the lost time. This lost time is lost capacity, and there is no safety reason to justify it.
Response: City staff does not believe that this improvement should be implemented. However, VDOT may assess this improvement in conjunction with the detailed operational analysis of short-term improvements. Capacity is not an issue for the signals within the interchange. Adjusting the signal offsets will likely not provide real benefits because traffic has not reached saturation. Under the current signal operation, all of the signal approaches within the circle provide more green time than the signal on approaches entering the circle. The signal approaches in the circle are green both before and after the approach entering the circle's green

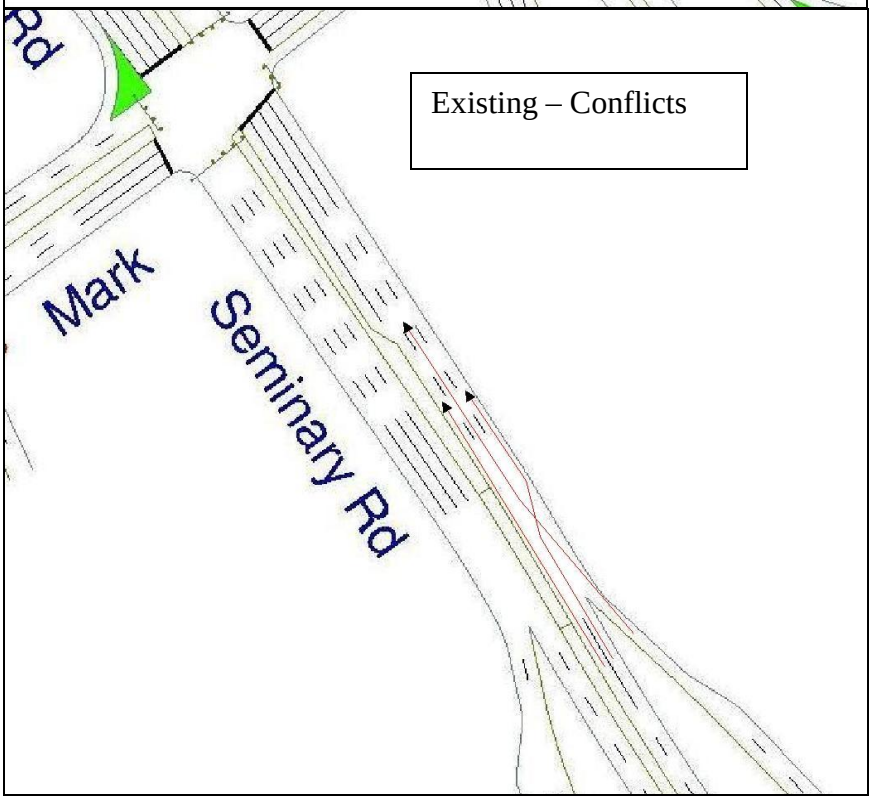
interval. Changing the signals within the circle to turn green a few seconds later than they do today would not add capacity and may even hurt operations if there are any residual queues in the circle. Furthermore, City staff is concerned that altering the offsets may create a safety issue because of the close proximity of the traffic signals around the circle. When traffic signals are closely spaced, drivers do not always see the signal displays because their attention is focused at a farther distance.

2. Traffic from the interchange merging onto westbound Seminary Road will need two lanes in order to take advantage of the above modification and to avoid backing traffic onto the interchange or freeway. Conversely, the traffic westbound on the high level of Seminary Road across the freeway is small enough to not require two lanes. Thus, the mainline of Seminary Road should be striped to merge down to a single lane as it slopes up to pass over the high level structure above I-395. Only this traffic would be permitted to turn left into Mark Center Drive, and this traffic would NOT be permitted (except for emergency vehicles) to turn right into Southern Towers, thus requiring signing near Kenmore Avenue westbound to direct Southern Towers traffic to pass through the middle level of the interchange (the way buses already do). The resultant approach westbound on Seminary at Mark Center Drive would be a left turn lane, one through lane from Seminary Road, two through lanes from the interchange, and a right only lane into Southern Towers. This will require more roadway construction than currently proposed by Duke, or at least the acceptance of narrower lanes on this approach.

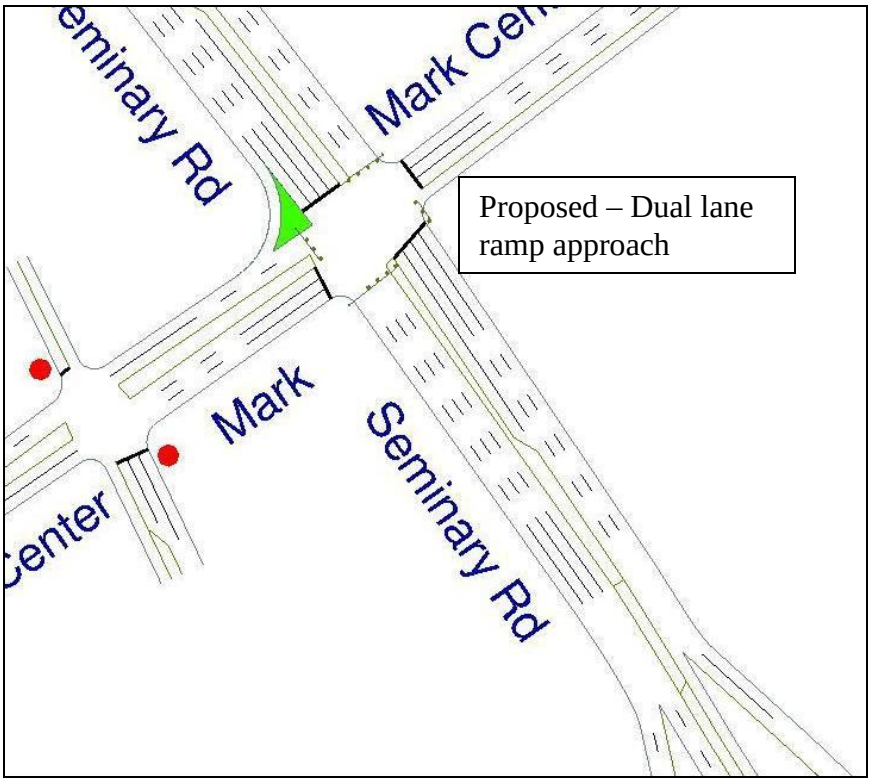
   Response: City staff believes that this proposed modification may not work adequately. However, more detailed evaluation should be conducted in conjunction with the VDOT detailed operational analysis of this and other short-term operational improvements. With BRAC, westbound Seminary Road carries over 1300 vph and the westbound ramp carries around 1800 vph during the AM peak hour. If westbound Seminary Road is reduced to one through lane all 1300 vph will be in a single lane and there may be inadequate gaps to allow vehicles to merge onto Seminary from the two lane ramp. Keeping two through lanes on Seminary will provide more gaps in traffic for the merge. Staff believes that consideration needs to be given to signalizing the merge onto Seminary Road.

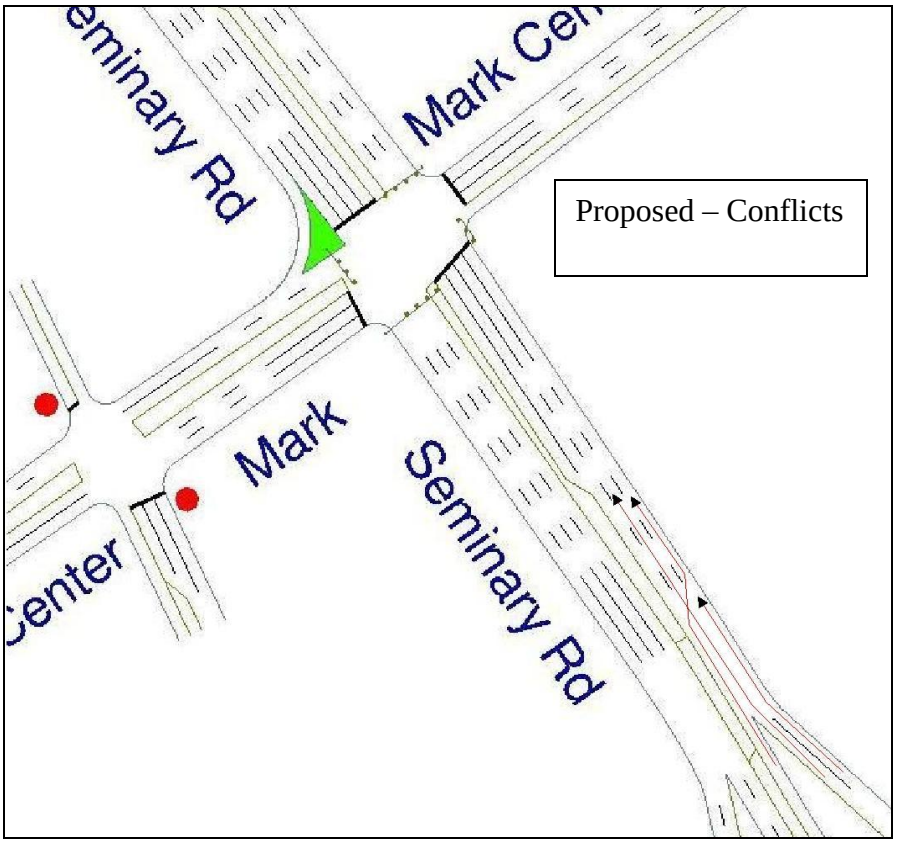


Existing – Single lane ramp approach



Existing – Conflicts





3. Westbound Seminary at Beauregard needs to have a true free right-turn lane, not one which gets blocked once two cars stop at the stop bar at the signal. This will improve

the saturation flow rate westbound, improving capacity. It will apparently require some right-of-way from Southern Towers.

Response: City staff recommends the implementation of this improvement. However, the implementation of this improvement has significant right-of-way and cost impacts. During peak hours the proposed improvement would reduce intersection delay. More detailed evaluation should be conducted in conjunction with the VDOT detailed operational analysis of this and other short-term operational improvements.

4. The signal at Mark Center Drive / Southern Towers is within the functional area of the interchange. That adversely affects not only the interchange, but all traffic operations in the general area. Since closing the intersection is not practical or feasible, it should be studied as to whether it would be beneficial to limit left-turn movements at this intersection in the peak periods to HOV and transit only. SOV traffic to/from Southern Towers or Mark Center would be directed to the entrances/exits to/from Beauregard.

   Response: City staff does not recommend the implementation of this modification. Restricting left turn movements to HOV and Transit only at the Seminary Road/Mark Center Drive intersection will adversely impact other intersections. This proposal will shift left turning traffic to the Seminary/Beauregard and the Beauregard/Mark Center intersections. The displaced traffic would decrease the Level of Service at the Seminary/Beauregard intersection from an E to an F in the morning peak and a D to an E in the afternoon peak. The Level of Service at the Beauregard/Mark Center intersection would decrease from a D to an F in the morning. A major issue with this proposal is that most of HOV traffic will not be able to access the Seminary/Mark Center intersection to take advantage of this proposal. Most of the HOV traffic comes from I-395 and will not be able to access this turn. Very little HOV traffic will be coming from either EB or WB Seminary Road.

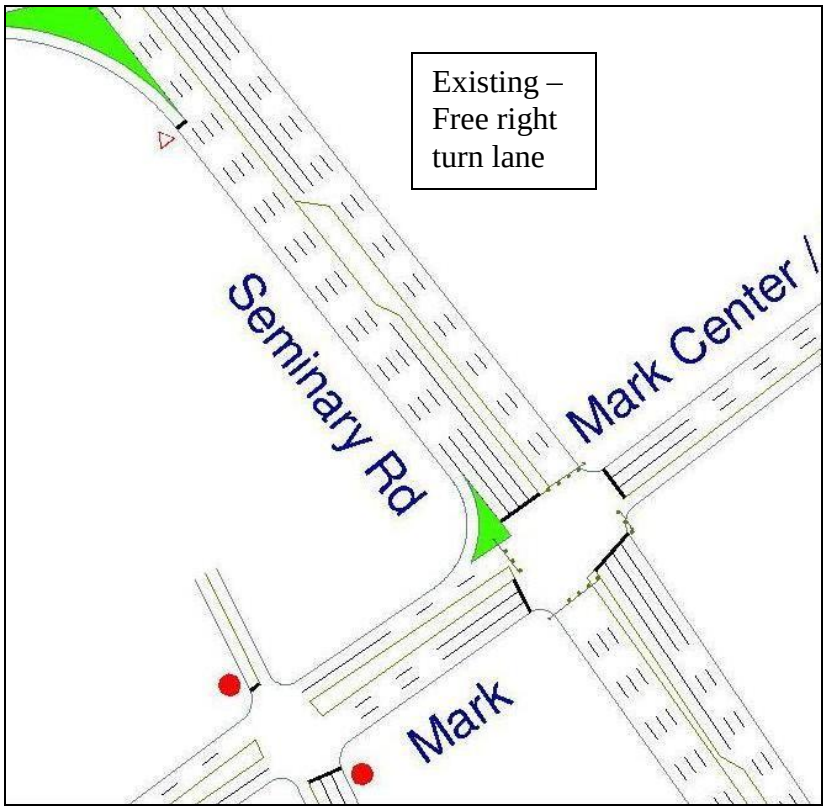
5. Traffic approaching Shirley Highway on eastbound Seminary west of Beauregard heavily favors the use of the right lane, creating imbalance and loss of capacity. Traffic headed to Shirley Highway from North Beauregard similarly has to use the right lane of three, but then it gets caught having to weave left one lane to get to the freeway, or weave left two lanes to get to eastbound Seminary Road. To address these lane imbalance and weaving issues, the following program needs to be implemented using signing and pavement markings and modest roadway widening within the right of way. Note that in general, overhead signs are clearly more effective, but for aesthetic reasons, they should be considered only if side-mounted signs and accompanying pavement markings are deemed to not be visible or will not do the job.

   a. Starting near the Seminary Park entrance on Seminary Road, the signing and markings need to inform/instruct the drivers as to which lanes to use to go north on I-395 or south on I-395. To make this effective, the right lane of three

eastbound through lanes on Seminary at Beauregard should be for 395 SB, the center lane for 395 NB, and the left lane for Seminary eastbound.
Response: Agreed, signing and marking improvements will help. However, if overhead signs are needed, the cost of the signing improvements may be high.

b. Starting near the intersection of Beauregard and Mark Center drive, the signs/markings on northbound Beauregard should indicate that the right lane is 395 traffic only.
Response: Agreed, signing and marking improvements will help. However, if overhead signs are needed, the cost of the signing improvements may be high.

c. The channelized right turn lane from NB Beauregard to EB Seminary would continue through the Mark Center interchange and not be a lane drop into Mark Center Drive. The island would come out.
Response: City staff does not recommend the implementation of this improvement. This proposal will increase the difficulty for traffic merging from NB Beauregard Street onto EB Seminary Road. The current configuration provides an acceleration lane for traffic making this movement onto Seminary Road. If the island is cut back to allow the rightmost lane to continue onto I-395, the Seminary Road traffic will cut over to the right lane immediately after the Beauregard intersection. This will have a negative impact on safety because this lane change will be occurring at the same time as the Beauregard traffic is attempting to merge on to Seminary Road.


Existing –
Free right
turn lane
Seminary Rd
Mark Center
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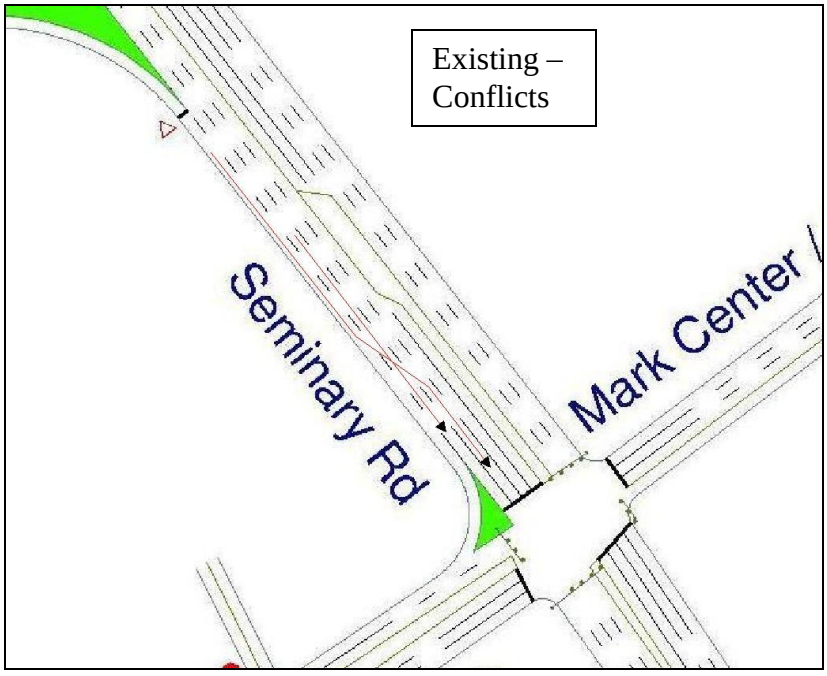
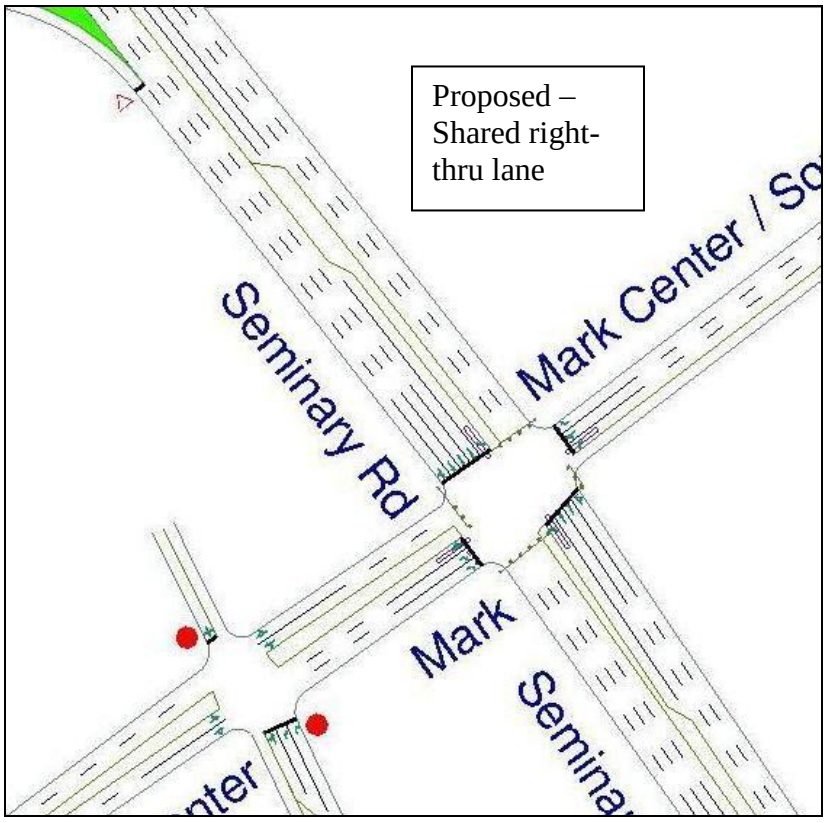

Existing –
Conflicts
Seminary Rd
Mark Center


Proposed –
Shared right-
thru lane
Seminary Rd
Mark Center / So
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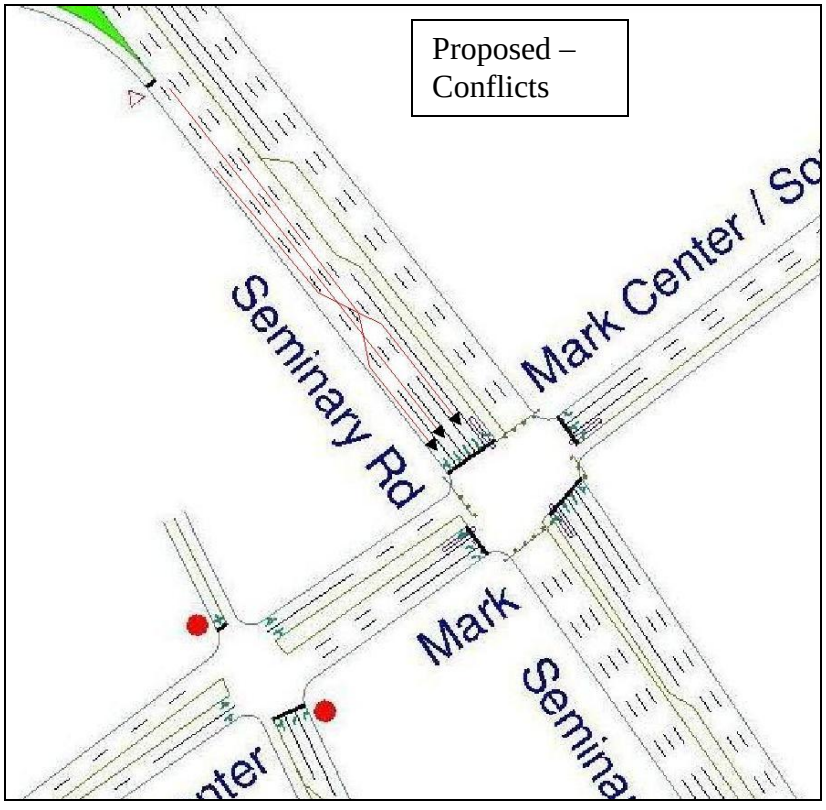
Proposed –
Conflicts
Seminary Rd
Mark Center / So
Mark
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d. The eastbound approach to Seminary at Mark Center should be four lanes with the previous modification. That approach should be signed/marked for the right lane to be right into Mark Center or through to 395 SB, the next lane signed/marked for 395 SB and NB, the 3rd lane for 395 NB, and the 4th for Seminary eastbound.

   Response: Noted, see above comment.

6. The northbound lanes of Beauregard should not include the lane drop into the rightmost lane of the dual left-turn to westbound Seminary Road. Rather, the rightmost lane should drop to the channelized right-turn lane 395 (as described above), but the other two lanes should then become through lanes at the Seminary signal.

   Response: More detailed evaluation should be conducted in conjunction with the VDOT detailed operational analysis of this and other short-term operational improvements. The proposed change may decrease the NB left turn capacity. Left turning vehicles will not be able to access the left turn lanes once the queue of through traffic extends past the left turn lane.

7. The diverge eastbound on Seminary just past Mark Center Drive has been improperly striped for years, not keeping with the overhead signing which exists just on the freeway ramps. As noted above, the proposed changed would create the opportunity for the three lanes to diverge right to I-395 where the center of the three lanes would be a choice lane serving both southbound and northbound traffic.

   Response: The striping will be modified.

8. Traffic exiting Mark Center on Mark Center Drive should be provided with dual right turn lanes, with right-turn-on-red permitted only from the rightmost lane.

   Response: This already exists.