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Review of Proposed Route 29 Bypass and Berkmar Drive Extended

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Overview and Summary

I have examined the compatibility of the plans for the proposed Route 29 North Bypass of Charlottesville (“Bypass”) – including the bridge over the South Fork Rivanna River (“River”) at the northern terminus of the Bypass – with Albemarle County’s plans to extend Berkmar Drive across the River north to the Hollymead Town Center. The purpose of Berkmar Drive Extended is to provide a key access road that will improve connectivity along the Route 29 corridor and take local traffic off of the highway. I understand that this project has been identified as a priority of the Albemarle County Board of Supervisors (“BOS”). The fundamental problem regarding the compatibility of the two roadways is that the Bypass bridge across the River would be located in the same place planned for the Berkmar Drive Extended crossing. This is because the Bypass plan, developed many years ago, did not account for Berkmar Drive Extended. Under any scenario, trying to fit two facilities in this space would be difficult and extremely expensive.

It is also my understanding that one of the primary considerations for the BOS’s reconsideration of its position on the Bypass is that the state would engineer the Bypass bridge across the River in such a way that Berkmar Drive Extended could use the same bridge to cross the River to reach the Hollymead Town Center. Such an option, however, would require a doubling of the width of the proposed eastside Bypass bridge to add 4 lanes on the eastside of this bridge, as well as building additional bridges to enable Berkmar Drive traffic to cross over the Bypass on the north side of the River. (See discussion of Option 1 below). No connection of Berkmar Drive to the Bypass would be possible under this option, and it would be problematic for safety and operational reasons.

Another alternative has been suggested to build interchanges on both sides of the River to allow Berkmar traffic to access the Bypass above and below the River, and thus have a partially combined facility. This option would require either the use of underpasses or overpasses, as well as a number of additional bridges and potentially extensive right of way.

A third option that has been mentioned would be to build a separate bridge adjacent to the Bypass bridge for Berkmar Drive traffic to cross the River. This alternative would require not only an additional bridge over the River, but also several bridges to enable Berkmar traffic to cross over the Bypass.

In light of the complexity of trying to accommodate both the Bypass and Berkmar Drive Extended, it would seem prudent to examine carefully the additional costs and design challenges that would be required to construct Berkmar Drive Extended if the Bypass were built.

Three Options for Crossing the Rivanna River With Both the 29 Bypass and Berkmar Drive Extended

1. Shared Bridge, Adjacent Roadways

In this option Berkmar Drive Extended could share the Bypass Bridge over the Rivanna River if the bridge were widened by four lanes: two travel lanes, one in each direction, plus a breakdown lane on both sides. This option would double the width of the proposed Bypass Bridge. However, enabling Berkmar Drive Extended traffic to share the Bypass Bridge is not feasible without also building on and off-ramps and under or overpasses so that Berkmar Drive traffic can access both north and southbound lanes of the Bypass. Even a signalized, or roundabout controlled, intersection on the Bypass is not feasible to enable Berkmar Drive traffic to crossover into the correct north or southbound lanes of the Bypass because the two roads are so close together.

Once Berkmar Drive traffic has crossed the river on the shared bridge, it must then cross an off-ramp and then an on-ramp of the Bypass. To do so would require one long, skewed bridge over the two ramps as shown in Figure 1A, for a total of two bridges including the bridge over the River. Alternatively, the Berkmar Drive extension could swing out to the east and cross the ramps closer to 90 degrees using two shorter bridges as shown in Figure 1B, for a total of three bridges for the project.

Notably, because Berkmar Drive is next to the Bypass, under the shared bridge option, it would be impossible to connect Berkmar Drive to the Bypass. Further, to raise the level of Berkmar Drive from the shared bridge to the overpass across the Bypass off-ramps -- only about 280 feet away -- would require a fairly steep grade of around 8 percent or greater, which may be unacceptable.

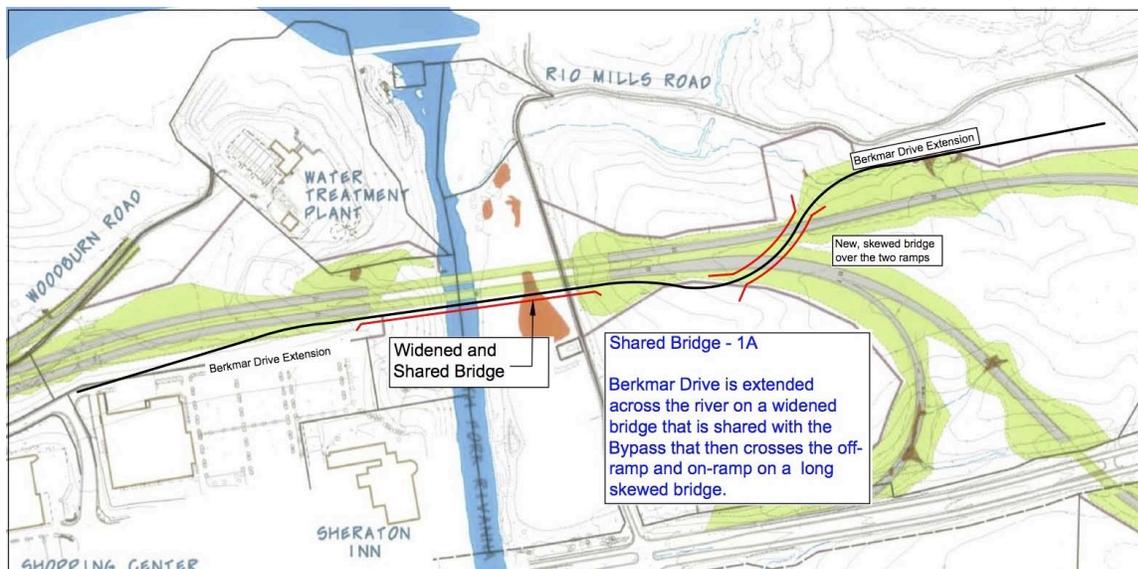


Figure 1A. Shared bridge and one long, skewed bridge over the Bypass ramps

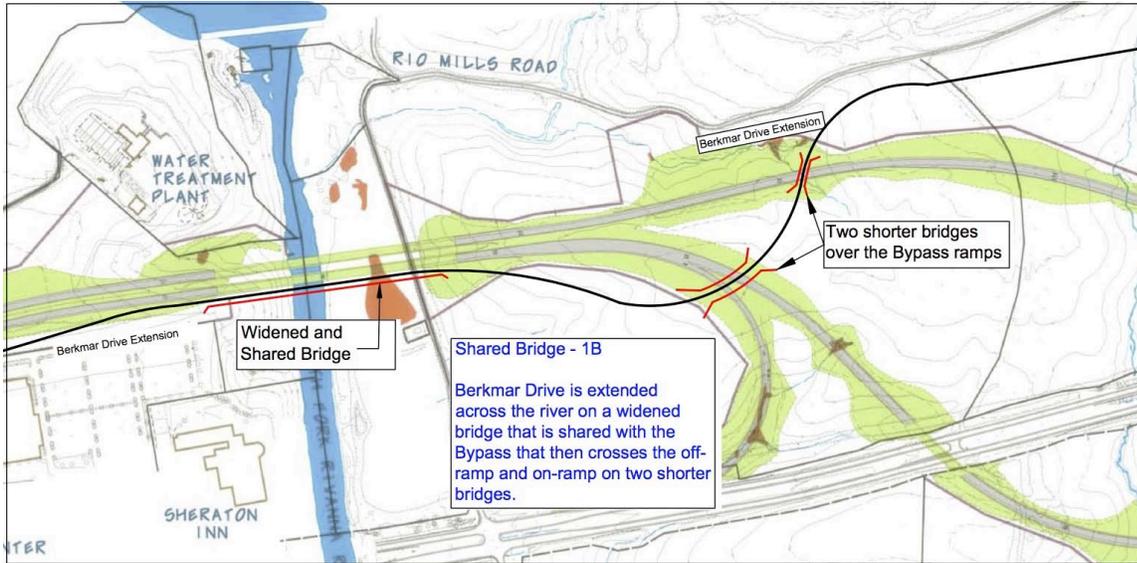


Figure 1B. Shared bridge with two shorter overpass bridges over the Bypass ramps

2. Connected Roadways, Additional Bridges and Use of Underpasses or Overpasses

Because physical constraints would preclude connection of Berkmar Drive Extended to the Bypass if a shared bridge over the River is used, it has been suggested that interchanges could be built on either side of the River that would allow such a connection. Although this can be done, as one county official noted, connecting Berkmar Drive Extended to the Bypass would be contrary to the goal of maintaining separation of the Bypass from local streets. It would also be very difficult and costly to achieve.

Figure 2A provides for an underpass on the south side of the river with two roundabouts to minimize the footprint of the interchange and to minimize the right-of-way that would need to be taken. This option requires a bridge under the bypass on the south side, a separate river crossing, and the use of Rio Mills Road on the north side, with an interchange to connect the two roads as shown in Figure 2A. Utilizing this design enables Berkmar Drive to cross to the other side of the Bypass and continue northwards to Hollymead Town Center without the need for separate bridges over the Bypass ramps. Although this option uses a much smaller footprint than the overpass option shown below, Berkmar Drive would have to be lowered about 23 feet below the Bypass to provide the necessary vehicle clearance. Because of lack of elevation information, and in particular information on the river levels and their variation, it was not possible to determine if an underpass would be affected by variations in water level in the river and whether or not it could be subject to flooding and in need of flood protection.

Figure 2A below shows two bridges: an underpass bridge of the Bypass on the south side of the River and a separate bridge over the River.

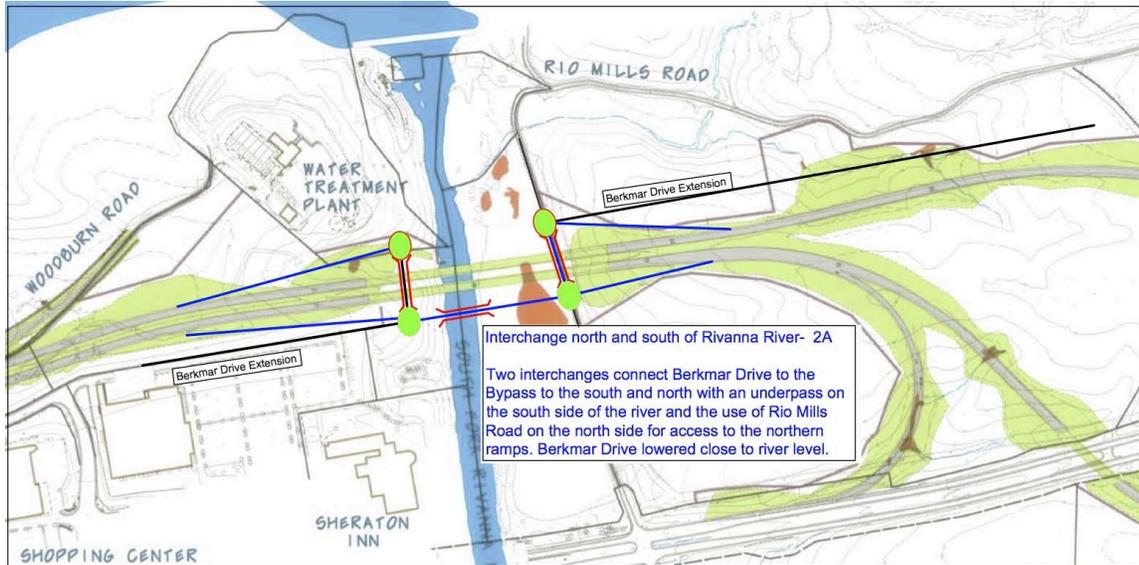


Figure 2A. Two interchanges using underpass on south side and Rio Mills Road on the north side of the River.

Figure 2B below shows a sample interchange design using overpasses to span the Bypass. It would require three overpass bridges and a long bridge across the river.

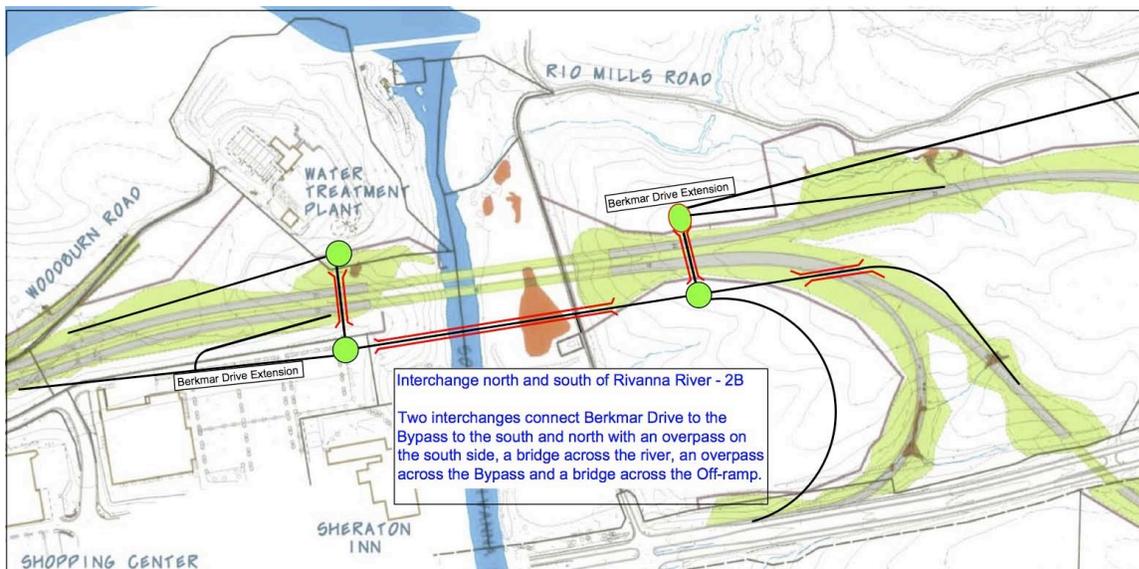


Figure 2B. Interchange on north and south sides of River using overpass

Because an overpass would require extensive ramps to provide access to the Bypass, extensive right-of-way would be required that would have significant effects on developed properties, including Lowes, the water treatment plant and other properties.

3. Separate Bridges across the Rivanna River, Separate Roadways

The suggestion has also been made that Berkmar Drive could be extended northwards across the River on a separate bridge that rises up to an overpass ramp across the Bypass off-ramp and then continues on and over the Bypass on-ramp on another bridge as shown in Figure 3A.

Alternatively it could curve away from the Bypass and cross the two ramps at an angle closer to 90 degrees, and so shorten the length of the two overpass bridges as shown in Figure 3B.

Because Rio Mills Road would then carry more traffic, an upgrade of that road would also be necessary, adding to the total cost of the project.

Both concepts require one long river bridge, and either one long overpass bridge or two short overpass bridges over the Bypass ramps. Also, both options are problematic and very expensive. 3B would also use extensive land area for ramps leading to overpasses. Alternatively, underpasses rather than overpasses could be used, requiring the same length bridges, but necessitating extensive cuts rather than fill.

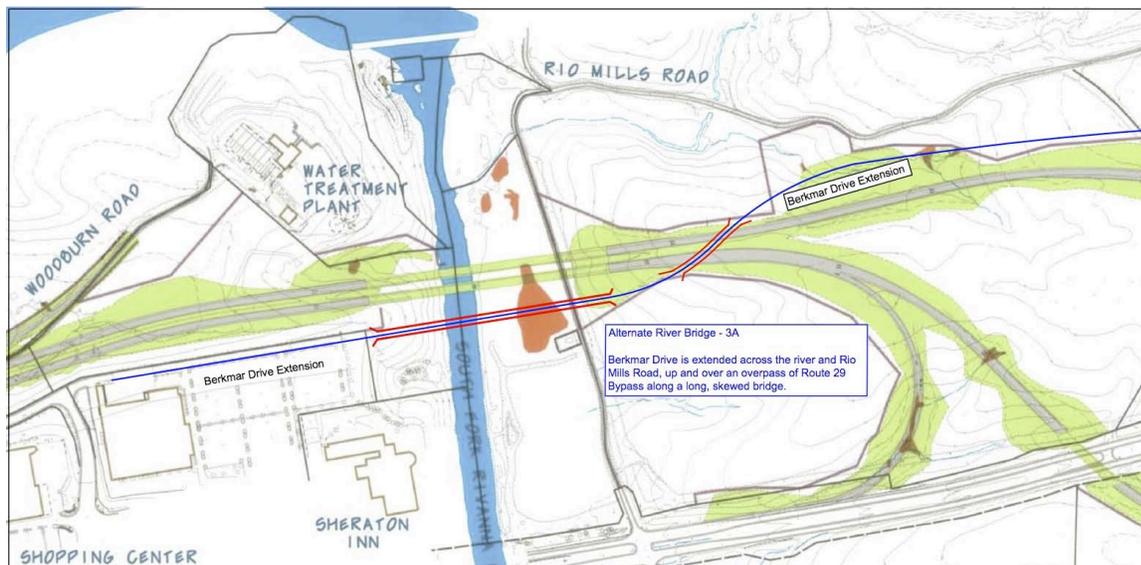


Figure 3A uses two long bridges

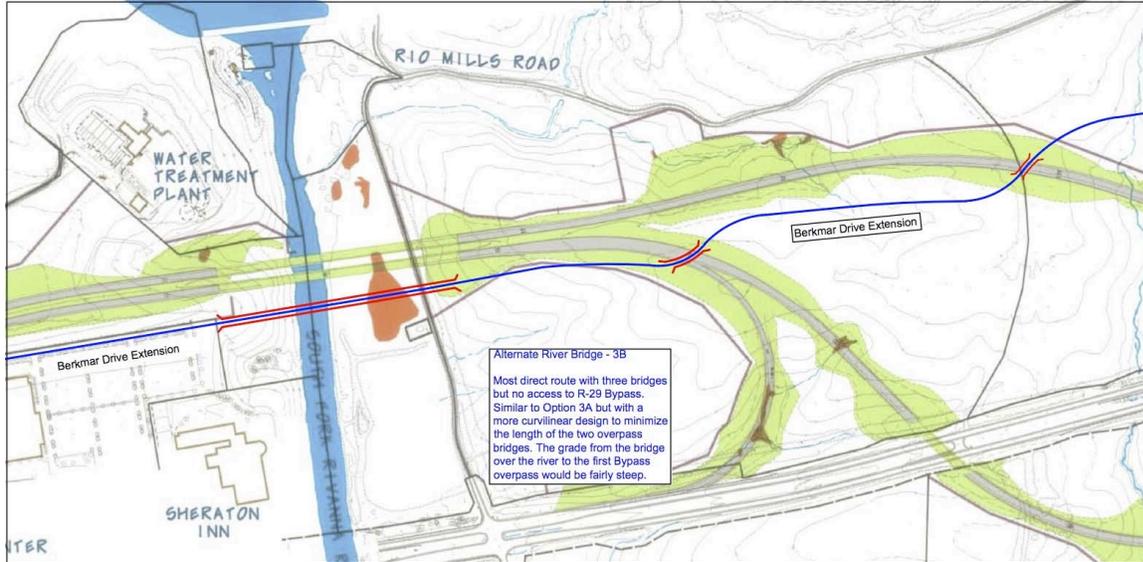


Figure 3B uses one lane and two short bridges

Finally, one additional option that would likely be ruled out immediately for a variety of reasons would be the construction of two full interchanges that would incorporate on and off ramps to the Bypass on both sides of the River. Similar to Option 2B, the necessary right of way for a full interchange south of the River would take out several existing businesses, while a full interchange on the north side of the River would require a complete redesign of the Bypass on and off ramps, with a massive and complex interchange.

Conclusion

The three main options discussed above face significant cost, engineering, and other challenges due to the number and length of bridges and under or overpasses needed. These challenges underscore the need for careful consideration of the costs and impacts of the proposed Bypass on the planned Berkmar Drive Extended.

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