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Mr. Neil Williamson  
Executive Director  
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550 Hillsdale Drive  
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Subject: Analysis of Proposed Grade Separation at the Intersection of  
US 29 and Rio Road

Dear Neil,

Thank you for the opportunity to assist the Free Enterprise Forum in developing cost estimates for the proposed grade separated intersections that are included in the 2<sup>nd</sup> draft report for the Places 29 master plan. To date, the Places 29 effort has not released cost estimates for the proposed interchanges. The scope of work we originally discussed would have required us to develop a cost estimate by determining work tasks and estimating construction quantities. As I explained in our second meeting, such an analysis would need to include some level of engineering design and would cost in excess of \$200,000. Because this amount far exceeded the available budget, the final scope was amended to include a review of pertinent studies and cost estimates to develop a relationship between the studied intersection(s) and those proposed in Places 29.

Volkert has reviewed estimated costs previously developed by VDOT for three interchanges along US 29, including US 29 and Rio Road. In 1995 dollars, the interchanges were estimated to cost \$15 million dollars each for construction exclusive of acquisition of right of way and assuming favorable geotechnical conditions. This cost estimate serves as the basis for our study. Our subsequent tasks adjust that number to 2015 dollars and identify design and construction related issues that could affect the final costs.

### ***PLACES 29***

The 2<sup>nd</sup> draft Places 29 report (dated June 5, 2007) outlines a preferred roadway concept that calls for improvements to US 29, including the construction of five grade separated intersections, and development of a parallel road network of local streets on both the east and west sides of US 29. For the purposes of this study, we examined one of those intersections, US 29 and Rio Road.

### **US 29/RIO INTERSECTION DESIGN**

The conceptual design of a limited access grade separated interchange at US 29 and Rio Road has been discussed in the Places 29 2<sup>nd</sup> draft report:

“the interchange at Rio will only have on-ramps from Rio to US 29 in two quadrants with the other two quadrants being served by a “Ring Road” configuration of roads around the intersection. Circulation in the Rio Road Area would be accomplished with a “Ring Road” that would intersect with US 29 at the existing signalized intersections at Albemarle Square and Shoppers World.” [page 5-53]

\*Please see the 1995 Interchange Design adjustments to cost estimates below.

It is also anticipated in the draft report that significant further planning is required to more fully develop, design and cost the grade separated interchange.

“The four quadrants around the intersection of Rio Road and US 29 are expected to experience a great amount of redevelopment in the next 5 to 10 years, and beyond. In particular, the southwestern quadrant (“Midtown”) with its multitude of properties would be well-served by the level of planning and coordination that a Small Area Plan can provide. In addition to encouraging and supporting redevelopment, the proposed grade separation for the intersection of Rio and US 29 can be addressed during the same planning process. More information about the coordination of a small area plan prepared by the County with the development of the design for the grade-separation by VDOT is given in Chapter 8—Implementation.” [page 5-35]

\*Please see the 1995 Interchange Design adjustments to cost estimates below.

## **1995 INTERCHANGE DESIGN**

Volkert identified the 1995 interchange number as the best baseline number that is publicly available. In 1995, the grade separated interchange design at US 29 and Rio Road was a full interchange with on-ramps in each direction. The \$15 million dollar estimate included design and construction costs. It was completed without finite quantities or a geotechnical study and did not include any traffic management or right of way acquisition costs.

## **ADJUSTMENTS TO 1995 COST ESTIMATE**

Our review of the U.S. 29 and Rio Road proposed grade separation and partial interchange cost estimate (projected to 2015) is limited by design and is constrained by a number of issues. In each of the following constraints, the estimated cost will likely increase.

### Site Conditions

Rio Road and Hydraulic Road intersects US 29 at the crest of a hill with a steep approach grade on US 29. The condition of the existing approach may indicate substantial rock below the surface, if rock is present, blasting activities and shoring along US 29 could increase construction costs. Secondary impacts would include an increase in time of construction and substantial difficulties in maintaining traffic.

The 1995 estimate was completed without a geotechnical study of the rock conditions in the intersection. Based on my 39+ years of experience in the Virginia Department of Transportation, including 11 years as the Chief Engineer and the elevation of the roadway at the US 29/Rio intersection, I believe that a rock contingency should be included. I suggest a 45% rock contingency.

### Inflation

Based on our expertise in road engineering and cost estimating and VDOT's own construction inflation factors we calculated the 2015 construction costs. With the caveats listed below we estimate the baseline cost per interchange in 2015 is \$38.42 million. The estimated cost of construction with the rock contingency, as described above, would increase to \$55.70\* million per interchange for the Rio Road and Hydraulic Road interchanges.

\* The Rock factor estimates are based on current data from the Federal Highway Administration and *Engineering News* data sources. These are estimates only and should not be construed as final costs.

### Maintenance of Traffic

We estimate it will take a minimum of two construction seasons to construct the grade separated intersection. Additional construction time will be needed if rock is encountered. The 1995 design included two additional ramps not currently envisioned in the Places 29 work. We believe these additional ramps will be necessary to maintain traffic during construction. An estimate of this line item was outside our scope of work; however, we have provided some additional discussion with respect to maintenance of traffic in our technical concerns.

### Right of Way

To understand the full financial requirements of the proposed improvements, a detailed right of way acquisition should be prepared for this commercial corridor. This effort would include acquisition of temporary construction easements as well as the permanent rights of way. Estimate of this line item was outside our scope of work.

## **TECHNICAL CONCERNS**

### Maintenance of Traffic

The maintenance of traffic will be a major concern during construction causing delays to the motorist and interruption of access to businesses located in the vicinity. The Places 29 study assumes, in addition to the US 29 proposed improvements, significant local street improvements parallel to US 29 on both the east and west sides of US 29. For traffic to have any hope of reaching its destination in a reasonable travel time, these improvements will have to be in place prior to construction of the interchanges.

US 29 is a major route paralleling Interstate 81 and Interstate 95 and is part of the Federal Aid Primary Route system serving the eastern United States. The proposed parallel road system will help local traffic and to some extent US 29 traffic, but it will not satisfactorily handle traffic detoured from US 29. We do not think the neither Federal Highway Administration nor Virginia Department of Transportation (VDOT) will allow this detour. We emphasize the need to maintain traffic flow through or around the construction and highlight some of the financial considerations associated with this line item.

In order to construct the grade separation while maintaining traffic, ramps parallel to US 29 would have to be constructed on or close to the same grade as existing US 29. While part of lowered US 29 is being built[N or S] of Rio Road and half of the new Rio Road bridge is being built, a temporary retaining wall has to be required to be constructed to support half of existing Rio Road and the ramps carrying the US 29 traffic.

When half of US 29 [N or S] and half of the Rio Road Bridge is completed, traffic will be placed on the new half. The process is repeated for the other half of the Rio Road bridge and US 29[N or S].

The time of construction could be improved with the detour and closure of Rio Road, but obtaining approval (see page. 3, paragraph 6) of the detour route is doubtful. The interchange as envisioned in the report would have two ramps. The Places 29 report does not yet have cost estimates included, although they will be included in a the unreleased Chapter 8-Implementation. We believe that four ramps will be required to carry US 29 through traffic during the construction period.

The grade separation as proposed is not a full movement interchange, only a partial interchange. The question of whether it is more economical to construct the ramps in their final configuration with permanent retaining walls and have a full service interchange or remove the ramps upon completion of construction would need to be addressed.

### Western Bypass EIS

It is important to note, we are aware the US 29 Bypass adopted by the Commonwealth Transportation Board [CTB] has an approved Final Supplemental Environmental Impact Statement [FEIS] as of May 2003[Appendix A]. This document addressed the traffic flow using the base case (Bypass), then with alternatives adding interchanges according to the three interchange concept.

VDOT held a Public Information Meeting for the then proposed interchange on October 26, 1994. The results of that meeting are in appendix B. As stated in the meeting minutes the City of Charlottesville by resolution dated January 7, 1995 requested VDOT to stop all design work and plan development for the proposed interchange at Hydraulic Road. The City's concerns were the construction cost and prolonged construction in the corridor. On February 16, 1995, VDOT terminated all design and future development on the three interchanges.

We feel, as indicated above, construction of the parallel road/street improvements will assist and improve the local traffic flow and access to the business community. These improvements should be in place prior to the development of the US 29 intersection improvements. These improvements

will likely have to be part of a new environmental impact statement to show the modifications/ changes from the FEIS approved by the CTB. [Appendix A].

## CONCLUSIONS

Based on the 1995 interchange estimates and increases in construction costs, each interchange will cost between \$38.42 million to \$55.70 million each dependent on geotechnical conditions. Based on this number the five interchanges will be between \$192.10 million to \$226.66 million exclusive of right of way acquisition costs. Additionally, rock was estimated for two intersections only, Rio Road and Hydraulic Road.

As the entire Places 29 plan is based on efficient performance of the proposed interchanges, there is a need to spend the resources necessary (\$200,000+) to refine the design and develop a realistic cost estimate.

In addition, there is a demonstrated need to adequately address the maintenance of traffic during construction before spending limited transportation resources to refine the design. If the traffic maintenance question can not be resolved the interchange will not be permitted.

In summary, we feel that when completed, the Places 29 concept will improve traffic flow on local streets and to a limited extent on US 29. If the U.S. 29 Bypass is also built then the thru traffic plus the majority of the commuters who go to the University via the North Grounds Connector (Leonard Sandridge Road) will be removed from the corridor. This will also be true for traffic from the north going to and from the athletic events.

Many if not all of the concerns stated above will have to be addressed for Hydraulic Road and each of the other five proposed grade separation intersection improvements.

In conclusion, it is critically important to consider potential revenue sources to build these interchanges and the prerequisite related parallel road system. Funding for one interchange will be difficult to obtain. Trying to construct all at one time would be a traffic nightmare.

We trust this is the information requested, if not we will make every effort to provide clarification.

Sincerely,

VOLKERT & ASSOCIATES, INC.



Jack S. Hodge, P.E.  
Vice President

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February 7, 2008

Enclosures

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