

SW Durham Drive at US 15-501

NCDOT Comments:

1. If future traffic projections (or actual traffic growth) predict larger volumes or more directional traffic, a SPUI design may not have the flexibility of a partial cloverleaf for improvement.
 - *DAVENPORT was tasked with providing a feasibility plan for a future interchange located at the intersection of US 15-501 and SW Durham Drive. As part of the functional design, a traffic analysis was required for the future interchange and service roads for the year 2040 to satisfy NCDOT. However, future flexibility in the type of interchange selected for use was not a requirement with our designs. Also, a partial cloverleaf design does not provide the same LOS or traffic functionality of the alternative presented.*
2. Although, overall the signals function with acceptable LOS, multiple movements are projected to function at LOSE and LOS F.
 - *The volumes were provided by the City of Durham therefore, the turning movements were very conservative. If the other traffic forecast volumes provided were used a different outcome could be possible. In final design, updated traffic volume data can be used and the analysis can be re-evaluated.*
3. The roadway design proposes that the grade on US 15-501 be raised for a distance of approximately 3,200 feet, just north of the 1-40/US 15-501 interchange to approximately 1400 ft. north of SW Durham Drive. The highest point along the proposed grade for US 15-501 is approximately 35 feet above the existing, while SW Durham Drive remains at its current elevation. The proposed grade will introduce retaining walls, traffic control and constructability issues along US 15-501. SW Durham Drive should be designed so that it is carried over or under US 15-501, while US 15-501 remains at its current elevation, thereby minimizing impacts to US-15-501. The Department recommends an evaluation of SW Durham Drive navigating over US 15-501.
 - *Consideration was given to carrying SW Durham Drive over US15-501. However, this option added significant costs to the project as a much larger structure would be needed (span length would have potentially been over 300' and over 250' wide), and would require additional retaining walls along SW Durham Drive in addition to the retaining walls needed along 15-501.*
4. No information was given regarding the beginning and ending grades for the project. The proposed vertical alignment along US I 5-501 does not tie to the existing alignment.
 - *The profile mimics the existing grade at both ends. Tying it in exactly was not necessary at the feasibility stage as the dtm surface is theoretical and not exact. It can be easily tied into 15-501 during the design stage of the project.*
5. NCDOT will need the grade to tie for all roads for a more thorough review.
 - *Tying in all roads is not necessary at the feasibility stage as the dtm surface is theoretical and not exact. All roads can be easily tied into a surveyed existing surface during the design stage of the project.*
6. It appears there may be a potential weaving problem on the service roads between the ramps and SW Durham Drive.
 - *The weaving issue can be addressed in a final design stage. During this phase of the analysis, the concern was to show that the preliminary functional design, all ramps and intersections, would function at a LOS D or better.*

7. An additional entrance lane on US 15-501 may be needed for both Ramps 'B' and 'D' to minimize weaving along the associated service roads.
 - *After a weaving analysis is completed in the final design phase, it will be determined.*
8. Show and/or explain how both service roads on the east and west end of the project tie in order to make the grade separation project function.
 - *See profiles for both -Y- and -SR2-. The tie in elevation is approximately 313' +/- . Also see cross-sections 36+00 – 39+00 -L-.*
9. Consider increasing the dual right turn lane tapers at .y. station 12+75 and 22+25 (SW Durham Drive) to 250 feet.
 - *The dual right turn tapers are as long as they possibly can be given the proximity to the side road tying in just North of the interchange. This future tie in point (intersection) can be shifted slightly during the design phase of the project if necessary.*
10. The proposed improvements should not impact the property in the quadrant of US 15/50 and SW Durham Drive adjacent to Watkins Road and Witherspoon Blvd.
 - *The only impact anticipated is grading to tie into the existing surface. This is anticipated with a construction easement and does not impact any of the parking, curbs, etc. Would only affect landscaped areas.*
11. The functional design should provide assumptions for the bridges span length, superstructure depth and vertical clearance between SW Durham Drive and US 15/501.
 - *Assumptions for span length, superstructure depth and vertical clearances were all used during the development of the concept. They are illustrated in the plan, profile and cross-section views of the project.*
12. The -Y- line (SW Durham Drive) profile does not represent existing conditions.
 - *The surface used was provided by NCDOT and was assumed to be the most current representation of the existing conditions. Our grades for SW Durham Drive tied directly into the grades along the existing 15-501 elevations so this should not be impactful to our designs shown.*
13. Explain and/or illustrate how the roadway under the proposed bridge will accommodate signals.
 - *This is a single point urban interchange with the -L- line traversing over the -Y- line. The signals will be accommodated just as they are for any other NCDOT SPUI layout.*
14. Dual right turn lanes are shown traversing into a single lane from SW Durham Drive onto Service Road I.
 - *This is a simple modification to the drawing. There are actually three lanes capable of receiving these turning movements. However, the proposed island in that quadrant will need to be reshaped and restriped to allow for the second right turn lane to tie in properly.*
15. The plan sheet scale is 1 inch equals 75 feet which is not measurable using an engineering scale. Any future plan submittals should have a more commonly used scale, i.e. 1 inch equals 100 feet.
 - *Noted.*