MEMORANDUM

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Date: September 11, 2018

To: Bryan Sowell, P.E.
NCDOT Division 12

From: Shreyas Bharadwaj, P.E (RK&K)

CC: File

Re: U-4700A: US 321 Widening from US 70 to US 321 ALT
US 321 Weave Analysis and 2nd Ave SW Two-Lane Analysis

Rummel, Klepper & Kahl, LLP (RK&K) was contracted by the North Carolina Department of Transportation (NCDOT) to perform a traffic operational analysis for Statewide Transportation Improvement Program Project U-4700A: US 321 Widening from US 70 to US 321 Alternate (ALT) in Catawba and Caldwell Counties. This memorandum presents analyses addressing the following elements:

1. Weave segment along southbound US 321 between 2nd Ave SW and US 70 ramps
2. Conversion of 2nd Ave SW from a one-way to a two-way, with westbound traffic from 1st Ave SW rerouted to 2nd Ave SW (assumed geometry is of a two-lane roadway)

Methodology

Intersection capacity analyses were performed using methodologies consistent with the Highway Capacity Manual (HCM) 6th Edition and the software program *Synchro* (Version 10.1, Build 2, Revision 20), for the signalized and unsignalized intersections within the study area. The results from the analyses are based on the HCM module within *Synchro*. Additionally, Highway and Freeway modules in the *Highway Capacity Software (HCS) 7.5* were utilized to analyze the arterial and weave segments, within the study area. The traffic analyses presented in this report follow the guidelines presented in NCDOT's Congestion Management Capacity Analysis Guidelines adopted July 1, 2015.

Volume Development

Traffic volumes for this study were based on the NCDOT approved U-4700 Traffic Capacity Analysis dated July 2017 and the U-4700 Traffic Forecast dated February 2017. The traffic capacity analysis report provided traffic volumes for the 2040 (Future Year) No-Build and Build scenarios. The volume for the US 321 interchange with US 70 were based on the traffic forecast. The Intersection Analysis Utility (IAU) tool was utilized to develop AM and PM peak hour volumes from the Annual Average Daily Traffic (AADT) volumes presented in the traffic forecast. The traffic volumes were balanced throughout the study area. **Figures 1 and 2** provides 2040 No-Build and Build traffic volumes, respectively.

Appendix A and **B** present the U-4700A capacity analysis and traffic forecast, respectively. The IAU tool output sheets are presented in **Appendix C**.