

MEMORANDUM

To: Mr. Craig Benedict, AICP – Orange County Planning Dept.
Mr. Michael Harvey, AICP – Orange County Planning Dept.

From: Earl Lewellyn, P.E. - Kimley-Horn

CC: Mr. Kevin Lacy, PE – NCDOT
Mr. Chuck Edwards, PE – NCDOT
Mr. Clarence Bunting, PE – NCDOT

Date: October 8, 2020

Subject: Beaver Crossing – Efland, NC – Exit 160 Weaving Assessment



In discussions regarding the Beaver Crossing project, North Carolina Department of Transportation (NCDOT) staff has consistently expressed significant concerns with the existing substandard “braided ramp” configuration along I-40/85 between Mt. Willing Road and the US 70/85 Connector. More specifically, the existing interchange ramp configuration is substandard for two primary reasons: (1) it presents a high-speed conflict point only 645 feet from the I-40 Westbound Exit 160 gore area without a deceleration lane, and (2) the weaving area is only 1,075 feet, compared to a minimal standard of 2,000 feet. It should also be noted that the problem of substandard weaving distance is further compounded by the lack of a deceleration lane for exiting traffic.

The combination of high speeds, insufficient weaving distance and increasingly high traffic volumes will ultimately cause this weave segment to fail from a capacity perspective. Based on the current geometry and traffic volumes, this weaving segment will approach failure with the addition of approximately 600 peak hour trips within the weaving segment. Below are examples of other land use scenarios for the subject property that would generate sufficient traffic to cause the weaving area to exceed capacity standards.

- 210,000 SF Shopping Center
- 20-Pump C-Store; 40,000 SF Gym; 110,000 SF Shopping Center; 60,000 SF Medical Office
- 20-Pump C-Store; (2) 5,000 SF Fast Food Restaurants; 85,000 SF Shopping Center; 60,000 SF Medical Office

Although the land use scenarios described above are viable options for development of this site, it would likely be cost prohibitive for such projects to fund the exit ramp closure and associated mitigation measures.

Even without any development on the subject property, the weaving segment will reach capacity in approximately 10-15 years as a result of ambient background traffic growth, and safety concerns are likely to develop well before weaving capacity is reached, leading to potential high-speed crashes.

While concerns related to substandard conditions are relevant with or without the Beaver Crossing project, NCDOT has required removal of Westbound I-40 Exit 160 as part of this project, thereby eliminating the two substandard design aspects noted previously. With improvements recommended as part of this project, removal of the Westbound I-40 Exit Ramp (Exit 160) and associated reassignment of traffic to the lower speed and lower risk approach at Exit 161 was found to be an appropriate measure to address existing concerns and accommodate existing and proposed development traffic volumes.

In summary, removal of the I-40 Westbound Exit 160 as part of the Beaver Crossing project will address an existing deficiency before it becomes a capacity or safety concern, at no expense to NCDOT or Orange County.