



**Traffic Capacity Analysis Methodology Memo for
U-5949 NC 210 Corridor Improvements in Onslow County, NC
March 25, 2019**

Introduction

The U-5949 Traffic Capacity Analysis evaluated various improvement alternatives for the NC 210 corridor from US 17 to south of SR 1518 (Old Folkstone Rd) in Onslow County, NC. The Technical Memo dated 7/24/2018 documented in details the intersection delays, Levels of Service (LOS), queue lengths, and network performance measures for each alternative. After the completion of the Technical Memo and during the Merger review process, questions were raised on the traffic analysis method (Intersection LOS instead of Arterial LOS) used to justify the four-lane widening recommendation. This memorandum is prepared to clarify the U-5949 traffic analysis methodology.

The Intersection LOS Analysis Method was used for the NC 210 project corridor based on current federal and state guidelines, as well as current industry practices. On arterials where the traffic signals are spaced less than two miles apart, the arterials are considered “urban streets” having “interrupted” traffic flow in the current Highway Capacity Manual¹.

The 2018 AASHTO Green Book² (roadway design guidelines) states that, for Arterial Streets and Highways in Urban Areas, “It is often difficult to establish design service flow rates for arterial streets and highways in urban areas... The capacity of an arterial is generally dominated by the capacity of its individual signalized intersections.”

For the NC 210 project corridor and other similar arterials, the standard industry practice and NCDOT’s approved traffic analysis method³ is to develop roadway improvement recommendations based on the Intersection LOS analysis results, taking into account the need for lane continuity and potential safety and access impacts.

The Arterial LOS Analysis Method was evaluated as requested, but not recommended due to its limitations. The “Arterial LOS” for the NC 210 corridor would be computed from travel times for the NC 210 through movements only. The Arterial LOS does not account for delays experienced by the turning movements, especially those on the side-streets. A corridor with good Arterial LOS may have poor-performing segments, bottleneck intersections or excessive delays on the side streets. Due to these limitations, the Highway Capacity Manual⁴ states that “Facility LOS must be interpreted with caution”.

Our Recommendation remains that Intersection LOS analysis instead of Arterial LOS analysis should be used to determine the NC 210 arterial configuration. In addition to the traffic analysis results, the four-lane median widening recommendation is also based on considerations of safety performance, speed (45~55 mph), access spacing (low to moderate), future travel demands and lane continuity.

References:

1. Highway Capacity Manual 6th Edition, Chapter 3 Model Characteristics – Motorized Vehicle Mode.
2. 2018 AASHTO A Policy on Geometric Design of Highway and Streets 7th Edition, Section 2.4.6.3 Arterial Streets and Highways in Urban Areas.
3. NCDOT Congestion Management Capacity Analysis Guidelines dated 7/1/2015.
4. Highway Capacity Manual 6th Edition, Chapter 16 Urban Street Facilities – Motorized Vehicle Methodology.