

Appendix E

Traffic Capacity Analysis Notes

General Notes

Assumed if a TWLTL exists leading up to a left-turn lane, the actual striped length of the turn bay may be adjusted to account for vehicles using the TWLTL as storage. A maximum of 600 feet should be used as the storage length if there is room. If the TWLWL ends before 600 feet, the full length of the TWLWL should be used as the storage length. If there is another intersection within 1200 feet that shares the TWLWL, each intersection will use half of the distance between intersections as the length of the left-turn storage. For instance, if a TWLTL exists between two intersections 800 feet apart, each left-turn lane will receive 400 feet of storage.

Any lane group at an intersection that has a forecast volume of 0 but the movement is allowed will be input as 1 vehicle in order to derive LOS.

All intersections were originally coded to operate as actuated within a coordinated system, which improves vehicle traffic progression through a series of traffic signals. According to the HCM 2000, actuated traffic signals affect the timing on all approaches to an intersection as a result of being influenced by vehicle detectors. This allows for phases to be shortened with low demand. Semi-actuated traffic signals typically only have vehicle detectors on the minor streets. As a result, semi-actuation allows for any unused green time from the minor streets to be reassigned to other phases. Upon optimizing the network cycle lengths, intersections were allowed to operate as semi-actuated and uncoordinated in order to optimize the operations of the entire corridor being analyzed.

Durham Sub-area

Intersection 1 – Hillandale Road at Hillandale-Hillsborough Connector

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for WB phase

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Provide exclusive right-turn lane for southbound approach on Hillandale Road.

Intersection 2 – Hillsborough Road at Hillandale-Hillsborough Connector

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for WB phase

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Provide exclusive right-turn lane for westbound approach on Hillsborough Road.

Intersection 3 – Hillsborough Road at W Main Street

Assumed no change in intersection configuration by 2035.

Assumed no pedestrian phasing

No change in intersection configuration due to Commuter Rail improvements

Intersection 4 – Erwin Road at Anderson Street

Assumed no change in intersection configuration by 2035.

Assumed pedestrian phasing for NB and SB phases

No change in intersection configuration due to Commuter Rail improvements

Intersection 5 – Main Street at 15th Street and Anderson Street

Assumed no change in intersection configuration by 2035.

Assumed pedestrian phasing for SB, NB, and WB

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, the following was assumed to be constructed as part of this project:

- Add an EB RT lane

Intersection 6 – Main Street at Broad Street and Swift Avenue

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for SB and WB

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, the following was assumed to be constructed as part of this project:

- Add an EB RT lane

Intersection 7 – Pettigrew Street and Swift Avenue

Assumed no change in intersection configuration by 2035

No change in intersection configuration due to Commuter Rail improvements

Due to low side street volumes, this intersection is assumed to remain unsignalized with Commuter Rail operating as an adjacent crossing that utilizes preemption control from Main Street at Swift Avenue and Broad Street intersection.

Short queues on side streets, therefore no mitigations deemed necessary

Intersection 8 – Buchanan Boulevard at Main Street

As a result of a short downstream lane drop as well as to account for a through lane blockage due to spillback from a railroad crossing, the outside eastbound lane was analyzed as a single right-turn lane rather than a shared through-right turn for all scenarios

Assumed pedestrian phasing for all legs

Reported intersection delay based on a weighted average of non-train and preempted train events.
Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

Intersection 9 – Duke Street at Main Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all legs

No change in intersection configuration due to Commuter Rail improvements

Intersection 10 – Duke Street at Memorial Street

Assumed no change in intersection configuration by 2035

Intersection configuration modified due to Commuter Rail improvements

- Assumed construction of WB approach with shared thru-RT lane to serve as a future entrance to Durham Multi-Modal Station park and ride

Short queues on side streets, therefore no additional mitigation required

Intersection 11 – Chapel Hill Street at Willard Street

Assumed no change in intersection configuration by 2035

Intersection configuration modified due to Commuter Rail improvements

- Signalization
- Assumed construction of SB approach with exclusive LT and shared thru-RT lanes as entrance to Durham Multi-modal Station park and ride

Assumed pedestrian phasing for all approaches

Intersection 12 – Chapel Hill Street at W Pettigrew Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for EB and NB approaches

No change in intersection configuration due to Commuter Rail improvements

Intersection 13 – Corcoran Street at Main Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all approaches

No change in intersection configuration due to Commuter Rail improvements

Assumed CBD area type

Intersection 14 – Corcoran Street at Ramseur Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all legs

Assumed CBD area type

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 11) and 205 second freight phase (Phase 12)
- No-Build/Build assumed 25 second clearance phase (Phase 11) and 45 second passenger rail phase (Phase 12)
- Build assumed 25 second clearance phase (Phase 11) and 40 second Commuter Rail phase (Phase 12)

Intersection 15 – Corcoran Street and Blackwell Street at West Pettigrew Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all legs

Assumed CBD area type

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 11) and 205 second freight phase (Phase 12)
- No-Build/Build assumed 25 second clearance phase (Phase 11) and 45 second passenger rail phase (Phase 12)
- Build assumed 25 second clearance phase (Phase 11) and 40 second Commuter Rail phase (Phase 12)

Intersection 16 – Mangum Street at Main Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all approaches

No change in intersection configuration due to Commuter Rail improvements

Intersection assumed to be in CBD

Intersection 17 – Mangum Street at Ramseur Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all legs

Assumed CBD area type

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 11) and 205 second freight phase (Phase 12)
- No-Build/Build assumed 25 second clearance phase (Phase 11) and 45 second passenger rail phase (Phase 12)
- Build assumed 25 second clearance phase (Phase 11) and 45 second Commuter Rail phase (Phase 12)

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Restripe EB approach to dual through lanes and dual right-turn lanes

Intersection 18 – Mangum Street at West Pettigrew Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all legs

Assumed CBD area type

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 11) and 205 second freight phase (Phase 12)
- No-Build/Build assumed 25 second clearance phase (Phase 11) and 45 second passenger rail phase (Phase 12)
- Build assumed 25 second clearance phase (Phase 11) and 45 second Commuter Rail phase (Phase 12)

Improvements assumed for 2035 Build with Conceptual Mitigation include:

Restripe EB approach to dual through lanes and dual right-turn lanes at the Mangum Street and Ramseur Street intersection (#17). Since both intersections are clustered together, the improvement at #17 positive affects #18, resulting in improved operations.

Intersection 19 – Dillard Street at East Pettigrew Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all legs

Reported intersection delay based on a weighted average of non-train and preempted train events.
Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, the following was assumed to be constructed as part of this project:

- Add an NB RT lane

Intersection 20 – Dillard Street at Roxboro Street

Assumed no change in intersection configuration by 2035

Assumed CBD area type

No change in intersection configuration due to Commuter Rail improvements

Intersection 21 – Fayetteville Street at East Pettigrew Street

Assumed no change in intersection configuration by 2035

Reported intersection delay based on a weighted average of non-train and preempted train events.
Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, the following was assumed to be constructed as part of this project:

- Add an NB RT lane

Intersection 22– Grant Street at East Pettigrew Street

Assumed no change in intersection configuration by 2035

Reported intersection delay based on a weighted average of non-train and preempted train events.
Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, the following was assumed to be constructed as part of this project:

- Restripe WB approach from a shared left and thru-right to a left and a shared thru-left

Intersection 23 – Pettigrew at Plum Street

Assumed no change in intersection configuration by 2035

No change in intersection configuration due to Commuter Rail improvements

Intersection 24 – Peabody Street at Driver Street

Assumed no change in intersection configuration by 2035

Reported intersection delay based on a weighted average of non-train and preempted train events.
Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- An exclusive SB RT lane on at Pettigrew Street and Driver Street intersections (#25). Since both intersections are clustered together, the improvement at #25 positive affects #24, resulting in improved operations.

Intersection 25 – Pettigrew Street at Driver Street

Assumed no change in intersection configuration by 2035

Reported intersection delay based on a weighted average of non-train and preempted train events.
Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, the following was assumed to be constructed as part of this project:

- Add an WB RT lane

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- An exclusive SB RT lane on Driver Street

Durham-Wake Sub-area

Intersection 26 – Angier Avenue at Glover Road

Assumed the following improvements will be added to the intersection as part of an LRTP project by 2035:

- Add a NB LT
- Add a SB LT
- Add an EB LT
- Signalize intersection

Assumed pedestrian phasing for all legs

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, the following was assumed to be constructed as part of this project:

- Add a SB RT lane

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Add a WB RT lane

Intersection 27 – Angier Avenue at Wrenn Road

Assumed no change in intersection configuration by 2035

No change in intersection configuration due to Commuter Rail improvements

Intersection 28 – Ellis Road at Research Triangle Academy

Assumed no change in intersection configuration by 2035

No change in intersection configuration due to Commuter Rail improvements

Intersection 29 – Miami Boulevard at Cornwallis Road

Assumed no change in intersection configuration by 2035

No change in intersection configuration due to Commuter Rail improvements

Intersection 30 – Chapel Hill Road at McCrimmon Parkway

Future single loop interchange assumed to be in place at this location by 2035. Dual left-turn and right-turn lanes are assumed at either end of the quadrant ramps. McCrimmon Parkway assumed to be a multi-lane facility through the interchange as designated in the LRTP.

Intersection 31 – McCrimmon Parkway and Church Street

Assumed no change in intersection configuration by 2035 for No-Build analysis.

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Add a NB RT lane.

Intersection 32 – Chapel Hill Road and Aviation Parkway/Morrisville Carpenter Road

Assumed no change in intersection configuration by 2035

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

Intersection 33 – Morrisville Carpenter Road at Church Street

Assumed no change in intersection configuration by 2035

No change in intersection configuration due to Commuter Rail improvements

Cary/Fairgrounds Sub-area

Intersection 34 – West Chatham Street at Harrison Avenue

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all approaches

Intersection 35 – West Chatham Street at Academy Street

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for all approaches

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Add a NB RT lane (potentially via restriping)

Intersection 36 – East Chatham Street at NE Maynard Road

Intersection configuration assumed to be modified by 2035 as part of a Chatham Street widening project:

- Assumed four-lane section along East Chatham Street with dual left-turns, two thru, and one right-turn lane in both the EB and WB direction

Assumed pedestrian phasing for E, SB, and WB approaches

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 135 second freight phase (Phase 11)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 11)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 11)

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Add a NB LT lane

Intersection 37 – E Chatham Street at Trinity Road

Intersection assumed to be signalized in 2035 Build Scenario

Intersection configuration assumed to be modified by 2035 based on proposed Chatham Street Widening and Trinity Road Extension projects:

- Assumed four-lane section along East Chatham Street with a left-turn, two thru lanes, and a right-turn lane in both EB and WB directions
- Assumed an exclusive left-turn lane and shared thru-right lane in both the northbound and southbound approaches
- Assumed construction of NB approach with exclusive LT lane and shared thru-RT lane for Trinity Road extension.

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to Commuter Rail improvements:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 135 second freight phase (Phase 11)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 11)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 11)

Assumed no pedestrian phasing

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Add a NB RT lane

Intersection 38 – NC 54 (Chapel Hill Road) at I-40 EB Ramps

Assumed no change in intersection configuration by 2035

No Intersection modifications due to Commuter Rail improvements

Assumed pedestrian phasing for two of the approaches

Intersection 39 – NC 54 (Chapel Hill Road) at I-40 WB Ramps

Assumed no change in intersection configuration by 2035

No Intersection modifications due to Commuter Rail improvements

Assumed pedestrian phasing for two of the approaches

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Provide an additional exclusive NB right turn lane

Intersection 40 – NC 54 (Chapel Hill Road) at Corporate Center Drive

Assumed no change in intersection configuration by 2035

No Intersection modifications due to Commuter Rail improvements

Assumed that NC 54 will be a four-lane facility per the CAMPO/DCHC MPO 2035 LRTP project A413. Turn lane assumptions were made based upon review of the future year no build project traffic volumes.

Assumed pedestrian phasing for all of the approaches

Intersection 41 – NC 54 (Chapel Hill Road) at Nowell Road

Assumed that NC 54 will be a four-lane facility per the CAMPO/DCHC MPO 2035 LRTP project A413. Turn lane assumptions were made based upon review of the future year no build project traffic volumes.

No Intersection modifications due to Commuter Rail improvements

Assumed pedestrian phasing for all of the approaches

Intersection 42 – Hillsborough Road at Nowell Road

Assumed no change in intersection configuration by 2035

Analyzed as unsignalized and results showed that there were not be adequate gaps to allow for any vehicles to enter the intersection from Nowell Road. Therefore, due to operational and safety concerns at the at-grade crossing it was assumed that the intersection would be signalized by 2035 in order to provide a basis of comparison. However, the intersection was analyzed as a Type VII crossing to evaluate the queuing due to the Commuter Rail crossing to show the effect on vehicular operations.

Assumed no pedestrian phasing

Intersection 43 – Hillsborough Road at NC 54 (Chapel Hill Road)

Assumed no change in intersection configuration by 2035

Assumed no pedestrian crossings on all approaches

Intersection 44 – Hillsborough Street at Powell Road

Assumed no change in intersection configuration by 2035

Assumed no pedestrian crossings on all approaches

Analyzed as unsignalized and results showed that there were not be adequate gaps to allow for any vehicles to enter the intersection from Powell Road. Therefore, due to operational and safety concerns at the at-grade crossing it was assumed that the intersection would be signalized by 2035 in order to provide a basis of comparison. However, the intersection was analyzed as a Type VII crossing to evaluate the queuing due to the Commuter Rail crossing to show the effect on vehicular operations.

Intersection 45 – Hillsborough Street at Beryl Road

Assumed no change in intersection configuration by 2035

Assumed pedestrian phasing for the northbound and eastbound phases

For this intersection, it was assumed that by 2035 the trains using the tracks across Beryl Road to the south of the intersection would use pre-emption.

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to preemption:

- No-Build/Build assumed 25 second clearance phase (Phase 9) and 135 second freight phase (Phase 10)
- No-Build/Build assumed 25 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 25 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, a right turn lane with 400 feet of storage was assumed to be constructed as part of the proposed project

Intersection 46 – Hillsborough Street at Royal Street

Assumed no change in intersection configuration by 2035

Intersection assumed to remain unsignalized by 2035

No Intersection modifications due to Commuter Rail improvements

Raleigh/Garner Sub-area

Intersection 47 – Cabarrus Street at Dawson Street

Assumed no change in intersection configuration by 2035

Assumed to be within CBD

Assumed pedestrian phasing for all of the approaches

For this intersection, it was assumed that by 2035 the trains using the tracks across Cabarrus Street to the west of the intersection would use pre-emption.

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to preemption:

- No-Build/Build assumed 34 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 34 second clearance phase (Phase 9) and 60 second passenger rail phase (Phase 10) due to the proximity of the downtown Raleigh Amtrak station
- Build assumed 34 second clearance phase (Phase 9) and 60 second Commuter Rail phase (Phase 10) due to the proximity of the downtown Raleigh station

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Restripe the WB approach to provide an exclusive left turn lane and shared thru-left lane, and code the EB and WB approaches as split phase

Intersection 48 – Cabarrus Street at West Street

Assumed no change in intersection configuration by 2035

Assumed to be within CBD

Intersection assumed to remain unsignalized by 2035

No Intersection modifications due to Commuter Rail improvements

Intersection 49 – Person Street/ Hammond Road at Hoke Street

Assumed no change in intersection configuration by 2035

Assumed no pedestrian crossings for all approaches

No Intersection modifications due to Commuter Rail improvements

Assumed to be a Type VII crossing due to the adjacent intersection of Hammond Road/Blount Street at Hoke Street not being analyzed due to low volumes

Intersection 50 – Hammond Road at Rush Street

Assumed no change in intersection configuration by 2035

Assumed no pedestrian crossings for all approaches

No Intersection modifications due to Commuter Rail improvements

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Add exclusive RT lanes for all approaches, and protect all left turns in order to overlap all right turns

Intersection 51 – Garner Road at Yeargan Road

Assumed Garner Road to be widened to three lanes (project R-9 in Traffic Analysis Methodology Report)

Assumed no pedestrian crossings for all approaches

For this intersection, it was assumed that by 2035 the trains using the tracks across Yeargan Road to the west of the intersection would use pre-emption.

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to preemption:

- No-Build/Build assumed 29 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 29 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 29 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, a right turn lane with 90 feet of storage was assumed to be constructed as part of the proposed project

Intersection 52 – Yeorgan Road at Mechanical Boulevard

Assumed no change in intersection configuration by 2035

Intersection assumed to remain unsignalized by 2035

No Intersection modifications due to Commuter Rail improvements

Intersection 53 – Garner Road at Vandora Springs Road

Assumed Garner Road to be widened to three lanes (project R-9 in Traffic Analysis Methodology Report)

Assumed no pedestrian crossings for all approaches

For this intersection, it was assumed that by 2035 the trains using the tracks across Vandora Springs Road to the south of the intersection would use pre-emption.

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to preemption:

- No-Build/Build assumed 15 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 15 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 15 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

Intersection 54 – Garner Road at Benson Road

Assumed Garner Road to be widened to three lanes (project R-9 in Traffic Analysis Methodology Report)

Assumed no pedestrian crossings for all approaches

No intersection modifications due to Commuter Rail improvements

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Add an exclusive NB right turn lane, resulting in an exclusive left turn lane, an exclusive thru lane, and an exclusive right turn lane

Intersection 55 – Garner Road at St. Mary's Street

Assumed Garner Road to be widened to three lanes (project R-9 in Traffic Analysis Methodology Report)

Intersection assumed to remain unsignalized by 2035

No intersection modifications due to Commuter Rail improvements

Intersection 56 – Garner Road at New Rand Road

Assumed Garner Road to be widened to three lanes (project R-9 in Traffic Analysis Methodology Report)

Assumed no pedestrian crossings for all approaches

For this intersection, it was assumed that by 2035 the trains using the tracks across New Rand Road to the south of the intersection would use pre-emption, requiring signal control.

Reported intersection delay based on a weighted average of non-train and preempted train events.

Intersection modifications due to preemption:

- No-Build/Build assumed 15 second clearance phase (Phase 9) and 205 second freight phase (Phase 10)
- No-Build/Build assumed 15 second clearance phase (Phase 9) and 45 second passenger rail phase (Phase 10)
- Build assumed 15 second clearance phase (Phase 9) and 45 second Commuter Rail phase (Phase 10)

For 2035 Build analysis, a right turn lane with 140 feet of storage was assumed to be constructed as part of the proposed project

Intersection 57 – US 70 at Jones Sausage Road/White Oak Road

Assumed no change in intersection configuration by 2035

Assumed no pedestrian crossings for all approaches

No intersection modifications due to Commuter Rail improvements

Intersection 58 – Garner Road at Auburn Knightdale Road

Assumed Garner Road to be widened to three lanes (project R-9 in Traffic Analysis Methodology Report)

Assumed no pedestrian crossings for all approaches

No intersection modifications due to Commuter Rail improvements

Intersection 59 – Auburn Knightdale Road at Auburn Rd

Assumed no change in intersection configuration by 2035

Intersection assumed to remain unsignalized by 2035

No intersection modifications due to Commuter Rail improvements

Intersection 60 – US 70 at Auburn Knightdale Road/Raynor Road

Assumed no change in intersection configuration by 2035

Assumed no pedestrian crossings for all approaches

No intersection modifications due to Commuter Rail improvements

Improvements assumed for 2035 Build with Conceptual Mitigation include:

- Add an exclusive NB left turn lane and an exclusive SB left turn lane, resulting in an exclusive left turn lane, a shared thru-left lane, and an exclusive right turn lane for each approach, and code the approaches as split phase