TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS.

August 20th, 2025

Rebecca Brehmer, CFM, CZO
Town Planner
Town of Swansboro
601 W. Corbett Ave
Swansboro, NC 28584
(910) 326-4428

RE: Flybridge Technical Review Memorandum

Dear Rebecca,

Timmons Group reviewed the Flybridge Traffic Impact Analysis (TIA) completed by DRMP and submitted to the North Carolina Department of Transportation (NCDOT) / Town of Swansboro (Town) on Tuesday May 21st, 2024. On Thursday March 14th, 2024, preliminary Town review comments were provided to NCDOT to be incorporated into the NCDOT's review comments. On Thursday March 21st, 2024, NCDOT's preliminary review comments were provided to DRMP's Project Engineer, Dyron Capers (see attached). Town's technical review comments have been included below as part of this memorandum.

<u>**TIA Memorandum Contents and Requirements**</u>

For the purposes of analysis, it was assumed that the proposed Flybridge Development will consist of the following land uses:

* 306 Apartment units**
* 35,000 Square-Foot (SF) shopping plaza
* 7,000 SF high-turnover restaurant
* 3,000 SF fast-food restaurant with drive-through
* Convenience store with gas station / 12 vehicle fueling positions

** Total proposed apartment units were increased to 324 units (additional 18 apartment units) following TIA approval (Wednesday, June 18th, 2024). No additional analysis was required. The NCDOT's TIA approval letter was updated Friday, August 9th, 2024, to include the additional 18 apartment units.

Per the NCDOT / Town's scope, the DRMP study included the following information:

1. (**Study Area**) See #3 below

2. (**Planned Roadway Improvements**) None

3. (**Roadway / Intersections to be Analyzed**) The following study area intersections were included for analysis:
   o NC-24 (W Corbett Ave) / Belgrade Swansboro Road / Access A
   o NC-24 (W Corbett Ave) / Access B
   o NC-24 (W Corbett Ave) / Access C
   o NC-24 (W Corbett Ave) / Queens Creek Road / School Exit
   o NC-24 (W Corbett Ave) / Norris Road / Walmart Entrance
   o NC-24 (W Corbett Ave) / Hammocks Beach Road
   o Belgrade-Swansboro Road / Swansboro Loop Road

4. (**Projected Trip Generation**) Trip generation included the Flybridge TIA

5. (**Preliminary Traffic Distribution**) The trip distribution was provided by DRMP prior to submittal and approved by NCDOT / Town.

    The residential stie trip distribution included:
    o   NC-24 to/from the east – 35%
    o   NC-24 to/from the west – 35%
    o   Queens Creek Road to/from the south – 15%
    o   Belgrade-Swansboro Road to/from the north – 10%
    o   Hammocks Beach Road to/from the south – 5%

    The retail stie trip distribution included:
    o   NC-24 to/from the east – 40%
    o   NC-24 to/from the west – 30%
    o   Queens Creek Road to/from the south – 15%
    o   Belgrade-Swansboro Road to/from the north – 5%
    o   Norris Road to/from the north – 5%
    o   Hammocks Beach Road to/from the south – 5%

6. (**Other Planned / Approved Developments**) Trips from the proposed Swansboro Wawa Development and West Corbett Avenue Starbucks were included in all future analyses.

7. (**Traffic Growth Rate**) A growth rate of 3.0% per year was used.

8. (**Available Traffic Data**) Turning movement counts collected by DRMP on May 2023.

9. (**Study Periods**) The TIA analyzed the following conditions:
    o   2023 Existing Traffic Conditions
    o   2026 No-Build Traffic Conditions
    o   2026 Build Traffic Conditions
    o   2026 Build Traffic Conditions with Improvements
    o   2027 No-Build Traffic Conditions**
    o   2027 Build Traffic Conditions**
    o   2027 Build Traffic Conditions with Improvements**

** Per Town standards, an additional 7% increase in traffic along NC-24 was used to account for peak season traffic.

10. (**Other Staff Concerns**) None

TIA Memorandum Findings

The document recommended the following improvements to mitigate congestion or queuing caused by the proposed development:

    o   *NC 24 / Belgrade-Swansboro Road / Access A*
        i.   Restripe the existing southbound left-turn lane to a shared left-through lane
        ii. Westbound left-turn lane extension (500-feet total storage + taper)
        iii. Northbound shared through / left-turn lane and 100-foot right-turn lane.
        iv. Eastbound right-turn lane (100-feet storage + taper).
        v.   Signal timing modifications.

- o *NC 24 / Queens Creek Road / School Exit*
    - i. Signal timing modifications.

- o *NC 24 & Access B*
    - i. Stop controlled northbound right-turn lane (right-in / right-out only).
    - ii. Eastbound right-turn lane (100-feet storage + taper).

- o *NC 24 & Access C*
    - i. Stop controlled northbound right-turn lane (right-in / right-out only).
    - ii. Eastbound right-turn lane (100-feet storage + taper).

The NC-24 (W Corbett Ave) / Belgrade-Swansboro Road / Access A intersection level of service, is projected to be LOS C and D during the 2026 Build AM and PM peak hours, respectively. With the recommended intersection improvements listed above, the north / southbound approaches are projected to operate unacceptably the Build + Improvement PM peak hours. Eastbound left-turn (SimTraffic) max queues are projected to exceed available 150-foot storage. Despite violating the Town's UDO, no additional improvement recommendations were provided or recommended. The minor street approaches are expected to experience higher intersection delays with coordinated signal timings and main street approach priority (maximizing progression). Additionally, aside from widening NC-24 (W Corbett Ave) to a six-lane cross-section, no amount of feasible geometric improvements can be constructed to allow the subject intersection to operate at LOS C or better.

The overall NC-24 (W Corbett Ave) / Queens Creek Road / School Exit intersection level of service, is projected to operate unacceptably during both peak hours for all analyzed conditions. With the recommended signal timings modification, the overall intersection Build + Improvement level of service is projected to improve or remain consistent with the Background condition. The minor street approach is expected to experience higher intersection delays with coordinated signal timings and main street approach priority (maximizing progression). No additional improvement recommendations were provided or recommended. As discussed above, aside from widening NC-24 (W Corbett Ave) to a six-lane cross-section, no amount of feasible geometric improvements can be constructed to allow the subject intersection to operate at LOS C or better.

The overall NC-24 (W Corbett Ave) / Norris Road / Walmart Entrance intersection level of service is projected to be LOS C during both Build peak hours. The northbound approach is projected to operate unacceptably during the PM peak hour (all analyzed conditions). The minor street approach is expected to experience higher intersection delays with coordinated signal timings and main street approach priority (maximizing progression). No improvement recommendations were provided or required.

The overall NC-24 (W Corbett Ave) / Hammocks Beach Road intersection level of service, is projected to be LOS C or better during both Build peak hours. The northbound approach is projected to operate unacceptably during the PM peak hour (all analyzed conditions). The minor street approach is expected to experience higher intersection delays with coordinated signal timings and main street approach priority (maximizing progression). No improvement recommendations were provided or required.

All Belgrade-Swansboro Road / Swansboro Loop Road unsignalized intersection approaches are projected to be LOS B or better during all analyzed conditions. No improvement recommendations were provided or are necessary to mitigate capacity concerns at this intersection.

All NC-24 (W Corbett Ave) / Access B unsignalized intersection approaches are projected to operate acceptably during the Build condition. Per NCDOT guidelines, a 100-foot eastbound

right-turn lane was recommended. No additional improvement recommendations were provided or are necessary to mitigate capacity concerns at this intersection.

All NC-24 (W Corbett Ave) / Access C unsignalized intersection approaches are projected to operate acceptably during the Build condition. Per NCDOT guidelines, a 100-foot eastbound right-turn lane was recommended. No additional improvement recommendations were provided or are necessary to mitigate capacity concerns at this intersection.

Timmons Group TIA Review Summary

Timmons Group reviewed the subject TIA and agreed with the project findings. The technical comments provided below were addressed. As mentioned above, the eastbound NC-24 (W Corbett Ave) / Belgrade-Swansboro Road / Access A left-turn lane should include a minimum 250-feet of storage (plus appropriate taper). On Tuesday May 14th, 2025, the Town's recommended improvements were provided to NCDOT and incorporated into the NCDOT's final review comments (see attached).

Timmons Group TIA Memorandum Review Comments

On Thursday March 14th, 2024, Town review comments (see below) were provided to NCDOT for incorporation into the NCDOT's review comments. The TIA comments listed below were addressed in the final TIA submittal. The proposed NC-24 driveway connections are to be reviewed and approved by the NCDOT (prior to construction) and designed in accordance with NCDOT Standards and Practices.

The following was noted in the review of the document / figures / tables:
- Executive Summary:
  - Section 1 states "Flybridge development to be located south of NC 24 and east of Queens Creek Road … ".
  - Table E-1: Site Trip Generation
    - Trips shown for Strip Retail Plaza (822) do not match trips shown in scoping document.
- Conceptual Land plan
  - Site Access not shown for Outparcel #5.
- Page 19, Site Trip Distribution and Assignment
  - Residential site trips stated as 30% to/from the west via NC 24, should be corrected to 35% to/from the west via NC24.
  - Residential site trips stated as 20% to/from the south via Queens Creek Road, should be corrected to 15% to/from the west via Queens Creek Road.
- Figure 3, 2023 Existing Lane Configurations
  - NC 24 / Queens Creek Road
    - Eastbound Right-Turn Lane storage should be 800 feet per comments provided on 12/11/2023.
  - NC 24 / Norris Road / Walmart Entrance
    - Westbound Left-Turn Lane storage should be 150 feet per comments provided on 12/11/2023.
- Figure 9b, Retail Site Trip Assignment
  - Trips shown include Pass-By volumes.
- Figure 12, Total Site Trip Assignment
  - Figure 12 needs to be updated with the comment on Figure 9b, Retail Site Trip Assignment.
- Figure 14, Recommended Lane Configurations
  - NC 24 / Belgrade-Swansboro Road

- EBR SimTraffic Max Queue (200 feet – AM/ PM Peak*), exceeds storage shown (150 feet).
- NBR SimTraffic Max Queue (140 feet – PM Peak*), exceeds storage shown (100 feet).
  * 2027 Build Conditions with Improvements
- Table 3: Trip Generation Summary
  o Trips shown for Strip Retail Plaza (822) do not match trips shown in scoping document.
- Table 5: Analysis Summary of NC 24 & Belgrade-Swansboro Road / Site Access A
  o 2026 / 2027 Build AM/PM Peak hour table does not match Synchro reports.

The following was noted in the review of the Synchro analysis files:
- NC 24 / Norris Road / Walmart Drive
  o 2026 / 2027 No Build / Build / Build + Imp PM Peak, Norris Road grade should be +1% per comments provided on 12/11/2023.

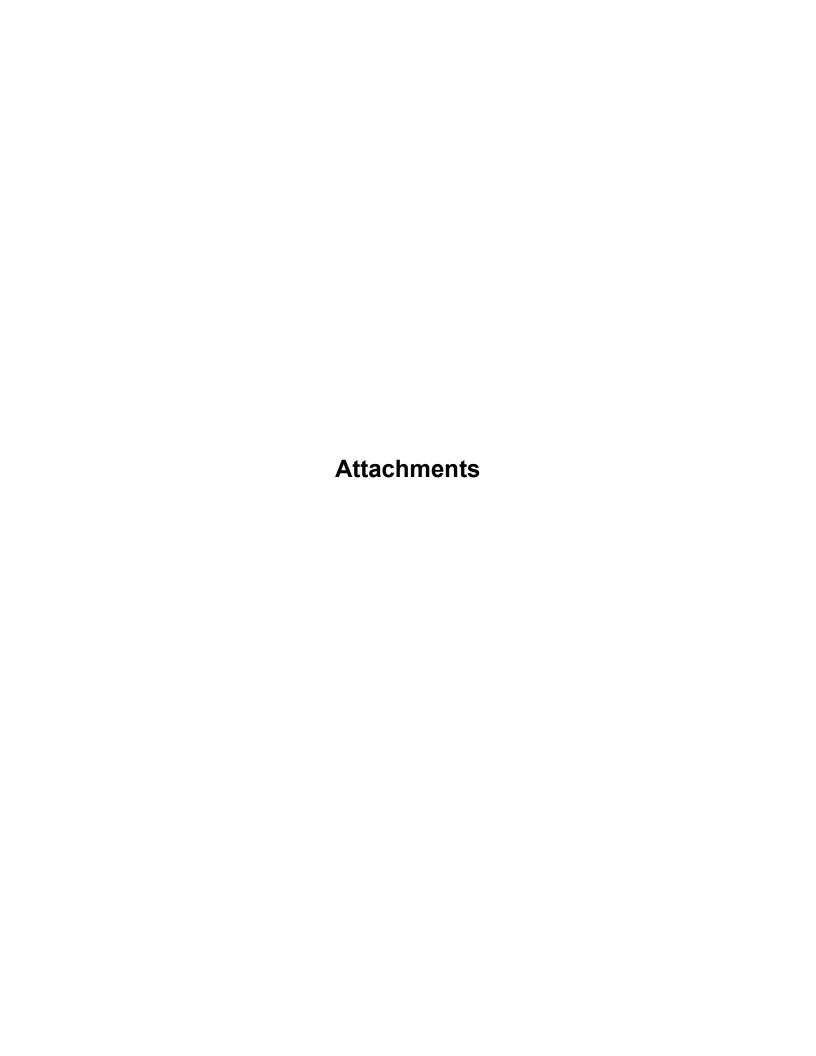The following was noted in the review of the technical appendix:
- Appendix C, Signal Plans
  o All coordinated signal timing plans should be included.
- Appendix F, Capacity Analysis Calculations, NC 24 & Queens Creek Road / School Exit
  o Analysis results for INT#1: NC 24 / Belgrade Swansboro Road shown instead of INT#2: NC 24 & Queens Creek Road / School Exit for all scenarios except 2023 Existing Scenario.

Should you have any questions regarding this memorandum or need any additional information from Timmons Group, please do not hesitate to contact me.

Sincerely,

8/20/25

Jeffrey P. Hochanadel, PE
Principal | Transportation Group Leader

Attachments

From: Cox, Bryce A
Sent: Thursday, March 21, 2024 4:03 PM
To: Dyron Capers <dcapers@drmp.com>; Jeff Hochanadel <Jeff.Hochanadel@timmons.com>; Koilada, Krupanidhi <kkoilada1@ncdot.gov>
Cc: Mathis, Stonewall D <sdmathis@ncdot.gov>; Spirakis, Kirsten L <klspirakis@ncdot.gov>; Sokolik-Porch, Tanya M <tmsokolik-porch@ncdot.gov>; Andrea Correll <acorrell@ci.swansboro.nc.us>; Garrett Blincoe <GBlincoe@drmp.com>
Subject: RE: [External] RE: Revised scope approval - Flybridge Development

Dyron,

Please see attached comments from NCDOT and Town of Swansboro on the provided TIA submittal for the Flybridge development.

Please address all comments and resubmit the TIA and all corresponding Synchro files.

For any questions regarding any comments from the Town, please reach out to Jeff Hochanadel (copied) and for NCDOT comments you may reach out to me and/or Krupa (copied).

Thank you.

Bryce A. Cox
Assistant Traffic Engineer
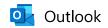North Carolina Department of Transportation
Division 3 Traffic

(910) 341-2200
bacox2@ncdot.gov

5504 Barbados Blvd
Castle Hayne, NC 28429

From: Dyron Capers <dcapers@drmp.com>
Sent: Thursday, February 22, 2024 9:28 AM

RE: [External] RE: Revised scope approval - Flybridge Development

From Jeff Hochanadel <Jeff.Hochanadel@timmons.com>

Date Thu 3/14/2024 9:44 AM

To Spirakis, Kirsten L <klspirakis@ncdot.gov>; Koilada, Krupanidhi <kkoilada1@ncdot.gov>; Andrea Correll <acorrell@ci.swansboro.nc.us>

Cc Mathis, Stonewall D <sdmathis@ncdot.gov>; Sokolik-Porch, Tanya M <tmsokolik-porch@ncdot.gov>; Cox, Bryce A <bacox2@ncdot.gov>; rbrehmer@ci.swansboro.nc.us <rbrehmer@ci.swansboro.nc.us>

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All,

Provided below are the Town's Flybridge Development TIA comments. I wanted to share the Town's comments (prior to sending to DRMP) so that all comments can be incorporated into the NCDOT's review comments.

1. Executive Summary:
   a. Section 1 states "Flybridge development to be located south of NC 24 and east of Queens Creek Road … ".
   b. Table E-1: Site Trip Generation
      i. Trips shown for Strip Retail Plaza (822) do not match trips shown in scoping document.
2. Conceptual Land plan
   a. Site Access not shown for Outparcel #5.
3. Page 19, Site Trip Distribution and Assignment
   a. Residential site trips stated as 30% to/from the west via NC 24, should be corrected to 35% to/from the west via NC24.
   b. Residential site trips stated as 20% to/from the south via Queens Creek Road, should be corrected to 15% to/from the west via Queens Creek Road.

Tables

1. Table 3: Trip Generation Summary
   a. Trips shown for Strip Retail Plaza (822) do not match trips shown in scoping document.
2. Table 5: Analysis Summary of NC 24 & Belgrade-Swansboro Road / Site Access A
   a. 2026 / 2027 Build AM/PM Peak hour table does not match Synchro reports.

Figures

1. Figure 3, 2023 Existing Lane Configurations
   a. NC 24 / Queens Creek Road
      i. Eastbound Right-Turn Lane storage should be 800 feet per comments provided on 12/11/2023.
   b. NC 24 / Norris Road / Walmart Entrance
      i. Westbound Left-Turn Lane storage should be 150 feet per comments provided on 12/11/2023.
2. Figure 9b, Retail Site Trip Assignment
   a. Trips shown include Pass-By volumes.
3. Figure 12, Total Site Trip Assignment
   a. Figure needs to be updated per comment #6.
4. Figure 14, Recommended Lane Configurations

a. NC 24 / Belgrade-Swansboro Road

          i. EBR SimTraffic Max Queue (200 feet – AM/ PM Peak*), exceeds storage shown (150 feet).

          ii. NBR SimTraffic Max Queue (140 feet – PM Peak*), exceeds storage shown (100 feet).

          * 2027 Build Conditions with Improvements

Synchro

1. NC 24 / Norris Road / Walmart Drive

    a. 2026 / 2027 No Build / Build / Build+Imp PM Peak, Norris Road grade should be +1% per comments provided on 12/11/2023.

Technical Appendix

1. Appendix C, Signal Plans

    a. All coordinated signal timing plans should be included.

2. Appendix F, Capacity Analysis Calculations, NC 24 & Queens Creek Road / School Exit

    a. Analysis results for INT#1: NC 24 / Belgrade Swansboro Road shown instead of INT#2: NC 24 & Queens Creek Road / School Exit for all scenarios except 2023 Existing Scenario.

Thanks!
Jeff

From: Dyron Capers <dcapers@drmp.com>
Sent: Thursday, February 22, 2024 9:28 AM
To: klspirakis <klspirakis@ncdot.gov>; Koilada, Krupanidhi <kkoilada1@ncdot.gov>; Jeff Hochanadel <Jeff.Hochanadel@timmons.com>; Andrea Correll <acorrell@ci.swansboro.nc.us>
Cc: sdmathis <sdmathis@ncdot.gov>; tmsokolik-porch <tmsokolik-porch@ncdot.gov>; Garrett Blincoe <GBlincoe@drmp.com>; bacox2 <bacox2@ncdot.gov>
Subject: RE: [External] RE: Revised scope approval - Flybridge Development

Good Morning,

Please see the attached folder for the Flybridge development. Hard copies will be sent to the district office and the town.

If you have any questions or issues accessing the files, please let me know!

Thanks,
Dyron

Dyron Capers, PE
Traffic Analysis Project Manager
Main: 704.549.4260 | Direct: 704.220.6859 | Cell: 617.595.8659
dcapers@drmp.com

8210 University Executive Park Drive
Suite 220, Charlotte, NC 28262

<u>Preliminary TIA Review</u>

TIA Name and date: Flybridge February 2024
Reviewer: BAC
Date Reviewed: 3/18/2024

Check parameters of study against the approved TIA Scope and Congestion Management guidelines. Use Blue ink for items that check off and Red ink for items that potentially need correction/revision or determine the TIA to be invalid and a resubmittal necessary.

General

- Correct Study Intersections included?
  - Yes
- Accesses:
  - Approved Accesses, Access Types, and Access Scenarios included?
    - Yes
  - Were new accesses, changes in type of access, or new scenarios added?
    - No
- Traffic Counts:
  - Correct peak hours?
    - Yes
  - Counts taken while school in session? (when applicable)
    - Yes
- Required Approved Developments included?
  - Yes
- Required Committed Improvements included? (TIP, etc.)
  - N/A
- Approved Annual Growth Rate applied correctly?
  - Yes
- Does Trip Generation match approved scope?
  - Yes
- Trip distributions:
  - Were trip distributions submitted for approval and approved prior to use in the TIA?
    - Yes
- Is the proper Horizon Year analyzed?
  - Yes

Synchro Analysis

- Check detector settings for signals:
  - Do the size and distance from the stop bar match the included signal plans?
    - Yes
  - If a proposed signal, are the detector settings designed according to the NCDOT Signal Design Manual?
    - Yes
- Is Right Turn on Red (RTOR) used?
  - Yes – Remove RTOR for EBR at NC 24 and Queens Creek Rd in 2026 Full Build AM

  Eliminate all RTOR phasing (existing and future). *Congestion Management guidelines state "do not analyze right turn on red at any proposed intersection approaches to ensure that adequate storage is provided."*

- Is proper Left-Turn Phasing used in analysis?
  - Yes

  Eliminate all PT+PM left-turn phasing in future conditions. *Congestion Management guidelines state that analysis of Protected-only phasing in future conditions will identify required storage in the event that Protected-only phasing is necessary.*
  Existing Permissive left-turn phasing should remain Permissive in future conditions, except where Protected-only phasing is being analyzed as an improvement to the intersection in Future + Improvement condition.

- Check for Recall Mode on Signalized Intersection. If simulating 'free run' operation (actuated-uncoordinated), use Min Recall on main street phase. If simulating 'Coordinated Mode' (Actuated-Coordinate), use C-Max.

  - C-min was used for coordinated intersections. Some intersections were modeled uncoordinated even when it is coordinated. Double check previously issued synchro comments.

Review of Proposed Improvements

- For Turning movements:
    - o Was a Queueing Summary included/used to determine storage requirements for turn lanes and stem requirements at signalized intersections?
        - o Yes
    - o Was the turn lane warrant nomograph from the *NCDOT Driveway Manual* used to determine storage requirements for turn lanes at unsignalized intersections?
        - o Yes
    - o For unsignalized intersections, use the *Guidelines for Signalization of Intersections with Two of Three Approaches (*ITRE report dated December 31, 2017) where applicable, to determine possible signalization.
        - o N/A
    - o For left-turn movements at signals, check cross product of left-turn hourly volumes and opposing volumes (thru, and thru + rights), for potential signalization or phasing change. (See Congestion Management guidelines and Chapter 11 of the *FHWA Signalized Intersections Informational Guide.*)
        - o Protected or Prot-Perm for WBLs at NC 24 & Belgrade-Swansboro Rd / Site Access A.
    - o For left-turn and right-turn movements, check total peak-hour volumes for potential dual turn lanes.

        - o Consider Dual Lefts for WBLs at NC 24 & Belgrade-Swansboro Rd / Site Access A.

Future No Build Synchro Review

TIA Name and date: Fly Bridge
Reviewer: BAC
Date Reviewed: 12/11/23

Check parameters of study against the approved TIA Scope and Congestion Management guidelines. Use Blue ink for items that check off and Red ink for items that potentially need correction/revision or determine the TIA to be invalid and a resubmittal necessary.

Intersections

Intersection 1: NC 24 (W. Corbett Avenue) at SR 1434 (Belgrade-Swansboro Road)
Lane Settings

- Are all entered volumes a minimum of 4 vph? (There should be no values of 0, 1, 2, or 3 for the most accurate calculations)
    - Yes
- Is the model showing the correct lane configuration at each approach?
    - Yes
- If entered, is the grade correct for each approach?
    - Yes
- Are the correct number of storage lanes entered and are they the correct lengths?
    - Yes
- Is the right turn set to channelized where necessary?
    - N/A
- Is Right Turn on Red (RTOR) used?
  Eliminate all RTOR phasing (existing and future). *Congestion Management guidelines state "do not analyze right turn on red at any proposed intersection approaches to ensure that adequate storage is provided."*
    - No

Timing Settings

- Are the turn types correct and associated with the correct phases?
  Eliminate all PT+PM left-turn phasing in future conditions. *Congestion Management guidelines state that analysis of Protected-only phasing in future conditions will identify required storage in the event that Protected-only phasing is necessary.*
  Existing Permissive left-turn phasing should remain Permissive in future conditions, except where Protected-only phasing is being analyzed as an improvement to the intersection in Future + Improvement condition.
    - Yes
- Is the lost time greater than or equal to 5 seconds?
    - Yes

- Check for Recall Mode on Signalized Intersection.
  If simulating 'free run' operation (actuated-uncoordinated), use Min Recall on main street phase.
  If simulating 'Coordinated Mode' (Actuated-Coordinate), use C-Max."
  - Signal is Actuated-Coordinated in PM. Use C-Max.

<div align="center">Phasing Settings</div>

- Is the control type correct?
  - Signal is Actuated-Coordinated in PM.
- Is the cycle length correct?
  - Use Coordinated Plan for PM.
- Is the offset correct?
  - Use Coordinated Plan for PM.
- Check "Referenced to" and "Reference Phase."
  - Use Coordinated Plan for PM.
- Check the times for minimum initial, maximum split, yellow time, all-red time, vehicle extension, minimum gap, time before reduce, time to reduce, walk time, and flash don't walk.
  Yellow times should either match the signal plans or be entered as a default of Y=5 s.
  All-Red times should either match the signal plans or be entered as a default of R=2 s.
  - Use Coordinated Plan for PM.
- Are the correct phases marked as pedestrian phases?
  - N/A

<div align="center">Detector Settings</div>

- Do the size and distance from the stop bar match the included signal plans?
  - Yes
- Are the leading and trailing detectors correct?
  - Yes
- Is the detector type correct?
  - Yes
- Are the detector channels, extend, and queue correct?
  - Yes
- Are the detector delays correct?
  - Yes

<div align="center"><u>Roads</u></div>

1. Road 1: NC 24 (W Corbett Avenue)
   - Is the speed limit correct?
     - Yes
   - If this road is a Y line, is it at least 1000 feet?
     - N/A
2. Road 2: SR 1434 (Belgrade-Swansboro Road)
   - Is the speed limit correct?
     - Yes
   - If this road is a Y line, is it at least 1000 feet?

- o Yes

Intersection 2: NC 24 (W. Corbett Avenue) at SR 1509 (Queens Creek Road)
Lane Settings

- Are all entered volumes a minimum of 4 vph? (There should be no values of 0, 1, 2, or 3 for the most accurate calculations)
    - o Yes
- Is the model showing the correct lane configuration at each approach?
    - o Yes
- If entered, is the grade correct for each approach?
    - o Yes
- Are the correct number of storage lanes entered and are they the correct lengths?
    - o EBR storage should be 800 feet.
- Is the right turn set to channelized where necessary?
    - o N/A
- Is Right Turn on Red (RTOR) used?
  Eliminate all RTOR phasing (existing and future). *Congestion Management guidelines state "do not analyze right turn on red at any proposed intersection approaches to ensure that adequate storage is provided."*
    - o No

Timing Settings

- Are the turn types correct and associated with the correct phases?
  Eliminate all PT+PM left-turn phasing in future conditions. *Congestion Management guidelines state that analysis of Protected-only phasing in future conditions will identify required storage in the event that Protected-only phasing is necessary.*
  Existing Permissive left-turn phasing should remain Permissive in future conditions, except where Protected-only phasing is being analyzed as an improvement to the intersection in Future + Improvement condition.
    - o Remove pm+pt phasing from WBL. Use Protected Only.
    - o NBL should be Phase 4; SBL & SBT should be Phase 3.
- Is the lost time greater than or equal to 5 seconds?
    - o Yes
- Check for Recall Mode on Signalized Intersection.
  If simulating 'free run' operation (actuated-uncoordinated), use Min Recall on main street phase.
  If simulating 'Coordinated Mode' (Actuated-Coordinate), use C-Max."
    - o Signal is Coordinated in PM. Use C-Max.

Phasing Settings

- Is the control type correct?
    - o Signal is Actuated-Coordinated in PM.
- Is the cycle length correct?
    - o Use Coordinated Plan for PM.

- Is the offset correct?
  - Use Coordinated Plan for PM.
- Check "Referenced to" and "Reference Phase."
  - Use Coordinated Plan for PM.
- Check the times for minimum initial, maximum split, yellow time, all-red time, vehicle extension, minimum gap, time before reduce, time to reduce, walk time, and flash don't walk.
  Yellow times should either match the signal plans or be entered as a default of Y=5 s.
  All-Red times should either match the signal plans or be entered as a default of R=2 s.
  - AM Phase 4 Walk Time – 7.0 sec.
  - AM Phase 4 Don't Walk – 20.0 sec.
  - Use Coordinated Plan for PM.
- Are the correct phases marked as pedestrian phases?
  - Missing Pedestrian Phase for Phase 4 in AM.
  - Check Coordination Plan for PM.

Detector Settings

- Do the size and distance from the stop bar match the included signal plans?
  - SBT detector position should be 0.
- Are the leading and trailing detectors correct?
  - SBT trailing detector should be 0 and leading detector should be 40.
- Is the detector type correct?
  - Yes
- Are the detector channels, extend, and queue correct?
  - Yes
- Are the detector delays correct?
  - Yes

Roads

3. Road 1: NC 24 (W. Corbett Avenue)
   - Is the speed limit correct?
   - Yes
   - If this road is a Y line, is it at least 1000 feet?
   - N/A
4. Road 2: SR 1509 (Queens Creek Road)
   - Is the speed limit correct?
   - Yes
   - If this road is a Y line, is it at least 1000 feet?
   - Yes

Intersection 3: NC 24 (W. Corbett Avenue) at SR 1445 (Norris Road)/Walmart Driveway

Lane Settings

- Are all entered volumes a minimum of 4 vph? (There should be no values of 0, 1, 2, or 3 for the most accurate calculations)
  - Yes
- Is the model showing the correct lane configuration at each approach?
  - Yes
- If entered, is the grade correct for each approach?
  - Norris Rd Grade should be +1% per Signal Plan
- Are the correct number of storage lanes entered and are they the correct lengths?
  - WBL storage should be 150 feet.
- Is the right turn set to channelized where necessary?
  - N/A
- Is Right Turn on Red (RTOR) used?
  Eliminate all RTOR phasing (existing and future). *Congestion Management guidelines state "do not analyze right turn on red at any proposed intersection approaches to ensure that adequate storage is provided."*
  - No

Timing Settings

- Are the turn types correct and associated with the correct phases?
  Eliminate all PT+PM left-turn phasing in future conditions. *Congestion Management guidelines state that analysis of Protected-only phasing in future conditions will identify required storage in the event that Protected-only phasing is necessary.*
  Existing Permissive left-turn phasing should remain Permissive in future conditions, except where Protected-only phasing is being analyzed as an improvement to the intersection in Future + Improvement condition.
  - Remove D.P. + P phasing for EBL & WBL. Use Protected Only.
- Is the lost time greater than or equal to 5 seconds?
  - Yes
- Check for Recall Mode on Signalized Intersection.
  If simulating 'free run' operation (actuated-uncoordinated), use Min Recall on main street phase.
  If simulating 'Coordinated Mode' (Actuated-Coordinate), use C-Max."
  - Use C-Max for PM.

Phasing Settings

- Is the control type correct?
  - Yes
- Is the cycle length correct?
  - Yes
- Is the offset correct?
  - Yes
- Check "Referenced to" and "Reference Phase."
  - Yes

- Check the times for minimum initial, maximum split, yellow time, all-red time, vehicle extension, minimum gap, time before reduce, time to reduce, walk time, and flash don't walk.
  Yellow times should either match the signal plans or be entered as a default of Y=5 s.
  All-Red times should either match the signal plans or be entered as a default of R=2 s.
  - Yes
- Are the correct phases marked as pedestrian phases?
  - N/A

Detector Settings

- Do the size and distance from the stop bar match the included signal plans?
  - Yes
- Are the leading and trailing detectors correct?
  - Yes
- Is the detector type correct?
  - Yes
- Are the detector channels, extend, and queue correct?
  - Yes
- Are the detector delays correct?
  - Yes

Roads

5. Road 1: NC 24 (W. Corbett Avenue)
   - Is the speed limit correct?
     - Yes
   - If this road is a Y line, is it at least 1000 feet?
     - N/A
6. Road 2: SR 1511 (Norris Road)
   - Is the speed limit correct?
     - Yes
   - If this road is a Y line, is it at least 1000 feet?
     - Yes

Intersection 4: NC 24 (W. Corbett Avenue) at SR 1511 (Hammocks Beach Road)
Lane Settings

- Are all entered volumes a minimum of 4 vph? (There should be no values of 0, 1, 2, or 3 for the most accurate calculations)
  - Yes
- Is the model showing the correct lane configuration at each approach?
  - Yes
- If entered, is the grade correct for each approach?
  - Yes
- Are the correct number of storage lanes entered and are they the correct lengths?
  - Yes

- Is the right turn set to channelized where necessary?
    - N/A
- Is Right Turn on Red (RTOR) used?
  Eliminate all RTOR phasing (existing and future). *Congestion Management guidelines state "do not analyze right turn on red at any proposed intersection approaches to ensure that adequate storage is provided."*
    - No

Timing Settings

- Are the turn types correct and associated with the correct phases?
  Eliminate all PT+PM left-turn phasing in future conditions. *Congestion Management guidelines state that analysis of Protected-only phasing in future conditions will identify required storage in the event that Protected-only phasing is necessary.*
  Existing Permissive left-turn phasing should remain Permissive in future conditions, except where Protected-only phasing is being analyzed as an improvement to the intersection in Future + Improvement condition.
    - Remove pm+pt for WBL. Use Protected Only.
- Is the lost time greater than or equal to 5 seconds?
    - Yes
- Check for Recall Mode on Signalized Intersection.
  If simulating 'free run' operation (actuated-uncoordinated), use Min Recall on main street phase.
  If simulating 'Coordinated Mode' (Actuated-Coordinate), use C-Max."
    - Signal is Actuated-Coordinated in PM. Use C-Max.

Phasing Settings

- Is the control type correct?
    - Signal is Actuated-Coordinated in PM.
- Is the cycle length correct?
    - Use Coordination Plan for PM.
- Is the offset correct?
    - Use Coordination Plan for PM.
- Check "Referenced to" and "Reference Phase."
    - Use Coordination Plan for PM.
- Check the times for minimum initial, maximum split, yellow time, all-red time, vehicle extension, minimum gap, time before reduce, time to reduce, walk time, and flash don't walk.
  Yellow times should either match the signal plans or be entered as a default of Y=5 s.
  All-Red times should either match the signal plans or be entered as a default of R=2 s.
    - Use Coordination Plan for PM.
- Are the correct phases marked as pedestrian phases?
    - N/A

Detector Settings

- Do the size and distance from the stop bar match the included signal plans?
    - Yes

- Are the leading and trailing detectors correct?
  - Yes
- Is the detector type correct?
  - Yes
- Are the detector channels, extend, and queue correct?
  - Yes
- Are the detector delays correct?
  - Yes

Roads

7. Road 1: NC 24 (W Corbett Avenue)
   - Is the speed limit correct?
     - Yes
   - If this road is a Y line, is it at least 1000 feet?
     - N/A
8. Road 2: SR 1511 (Hammocks Beach Road)
   - Is the speed limit correct?
     - Yes
   - If this road is a Y line, is it at least 1000 feet?
     - Yes

Intersection 5: SR 1424 (Belgrade-Swansboro Road) at SR 1444 (Swansboro Loop Road)
Lane Settings

- Are all entered volumes a minimum of 4 vph? (There should be no values of 0, 1, 2, or 3 for the most accurate calculations)
  - Yes
- Is the model showing the correct lane configuration at each approach?
  - Yes
- If entered, is the grade correct for each approach?
  - N/A
- Are the correct number of storage lanes entered and are they the correct lengths?
  - N/A
- Is the right turn set to channelized where necessary?
  - N/A
- Is Right Turn on Red (RTOR) used?
  Eliminate all RTOR phasing (existing and future). *Congestion Management guidelines state "do not analyze right turn on red at any proposed intersection approaches to ensure that adequate storage is provided."*
  - No

Roads

9. Road 1: SR 1434 (Belgrade-Swansboro Road)
   - Is the speed limit correct?
     - Yes

- If this road is a Y line, is it at least 1000 feet?
    - N/A
10. Road 2: SR 1444 (Swansboro Loop Road)
    - Is the speed limit correct?
        - Yes
    - If this road is a Y line, is it at least 1000 feet?
        - Yes

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

~~June 18, 2024~~ August 9, 2024

Dyron Capers, PE
DRMP
5808 Faringdon Place
Raleigh, NC 27609

RE: REVISED Approval of the Traffic Impact Analysis (TIA) associated with the
proposed **Flybridge (formerly Reserve at Swans Quarter)** development in
Swansboro, NC.

The NCDOT and Town of Swansboro staff have reviewed the Flybridge TIA dated May 21,
2024. This development consists of:

- ~~306~~ 324 dwelling units: Multifamily Housing (Low-Rise) (LUC 220)
- 35,000 square feet: Strip Retail Plaza (LUC 822)
- 7,000 square feet: High-Turnover Restaurant (LUC 932)
- 3,000 square feet: Fast Food Restaurant with Drive-Thru (LUC 934)
- 12 Fueling Positions: Gas Station/Convenience Store (LUC 945)
    o   Build Year: 2026

Based on review of the analysis provided in the TIA report, the following improvements
are required by the developer. See below the intersections and access types that were
studied in the TIA:

NC 24 (Corbett Avenue) and SR 1434 (Belgrade-Swansboro Road) / Access A
(existing signalized intersection)
- Construct Access A (northbound approach) as the fourth leg of the intersection
  with one ingress lane and two egress lanes, configured as an exclusive left turn
  lane and a shared thru-right lane each with 200 feet of full-width storage.
- Provide an internal protected stem length of 200 feet, as measured from the
  right-of-way line.
- Extend the existing southbound right turn lane on SR 1434 (Belgrade-Swansboro
  Road) to provide 150 feet of storage and appropriate full-width deceleration and
  taper.
- Restripe the southbound right turn lane to a shared thru-right lane.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS | DIVISION 3 | DISTRICT 1
295-B WILMINGTON HIGHWAY
JACKSONVILLE, NC 28540

Telephone: (910 467-0520
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location
295-B WILMINGTON HIGHWAY
JACKSONVILLE, NC 28540

- Construct an eastbound right turn lane on NC 24 (Corbett Avenue) with 100 feet of storage and appropriate full-width deceleration and taper.
- Reconstruct the eastbound and westbound left turn lanes on NC 24 (Corbett Avenue) as offset lefts.
  - Extend the existing eastbound left turn lane to provide 250 feet of storage and appropriate full-width deceleration and taper.
  - Extend the existing westbound left turn lane to provide 500 feet of storage and appropriate full-width deceleration and taper.
- Provide a four-section FYA for the exclusive left turn lane at all four approaches.
- Optimize signal timings.
- Modify the signal plan to accommodate the above improvements.

NC 24 (Corbett Avenue) and SR 1509 (Queens Creek Road) / School Exit (existing signalized intersection)
- Restripe the northbound left turn lane on SR 1509 (Queens Creek Road) to provide 300 feet of full-width storage.
- Optimize signal timings.

NC 24 (Corbett Avenue) and SR 1445 (Norris Road) / Walmart Entrance (existing signalized intersection)
- No improvements are required.

NC 24 (Corbett Avenue) and SR 1511 (Hammocks Beach Road) (existing signalized intersection)
- No improvements are required.

SR 1434 (Belgrade-Swansboro Road) and SR 1444 (Swansboro Loop Road) (existing stop-controlled intersection)
- No improvements are required.

NC 24 (Corbett Avenue) and Site Access B (proposed right-in/right-out intersection)
- Construct Site Access B (northbound approach) with one ingress and one egress lane, configured as a right-in, right-out (RIRO) intersection.
- Provide stop-control for northbound approach.
- Provide an internal protected stem of 100 feet, measured from the right-of-way.
- Construct an eastbound right turn lane on NC 24 (Corbett Avenue) with 100 feet of storage and appropriate full-width deceleration and taper.

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NC 24 (Corbett Avenue) and Site Access C (proposed right-in/right-out intersection)
- Construct Site Access B (northbound approach) with one ingress and one egress lane, configured as a right-in, right-out (RIRO) intersection.
- Provide stop-control for northbound approach.
- Provide an internal protected stem of 100 feet, measured from the right-of-way.
- Construct a full-width eastbound right turn lane on NC 24 (Corbett Avenue) as a continuous right turn lane from Site Access B.

If changes are made to the proposed site driveways, land uses, land use intensity, or other study parameters, or if the build year studied in the report has passed, a revised Traffic Impact Analysis will be required for review by NCDOT. Any such changes will null and void this TIA approval.

The applicant is required to obtain all applicable Onslow County and NCDOT permits for access to the road network. A copy of this TIA approval shall be included with any NCDOT driveway permit application. All applicable NCDOT and Onslow County technical standards and policies shall apply.

Please contact me at 910-467-0500 with any questions regarding this approval.

Sincerely,

DocuSigned by:

Kirsten Spirakis

BA41E7372F904EC...

Kirsten Spirakis, PE
District Engineer
Division 3, District 1

ec: Krista Kimmel, PE, Deputy District Engineer, NCDOT
        Robert Vause, PE, Engineering Consultant, NCDOT
        Stonewall Mathis, PE, Division Traffic Engineer, NCDOT
        Krupa Koilada, Senior Assistant Traffic Engineer, NCDOT
        Bryce Cox, Assistant Traffic Engineer, NCDOT
        Jon Barlow, Interim Town Manager, Town of Swansboro
        Rebecca Brehmer, Projects/Planning Coordinator, Town of Swansboro

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