

SUBDIVISION REPORT - CONCEPT

► FILE #: 3-SB-21-C		AGENDA ITEM #: 22
POSTPONEMENT(S):	3/11/2021-6/10/2021	AGENDA DATE: 7/8/2021
SUBDIVISION:	INNSBRUCK FARMS	
APPLICANT/DEVELOPER:	RC RUGGLES, LLC	
OWNER(S):	Blaine Cristman	
TAX IDENTIFICATION:	52 02601, 026, 027, 032, 034 052NB001	View map on KGIS
JURISDICTION:	County Commission District 8	
STREET ADDRESS:	0 & 908 Blake Ln. (0 Burris Rd.; 8621, 0 & 8	605 N. Ruggles Ferry Pk.)
► LOCATION:	North side of Ruggles Ferry Pk., west & r Graves Rd.	orth of Blake Ln., east of
SECTOR PLAN:	East County	
GROWTH POLICY PLAN:	Planned Growth Area	
WATERSHED:	Holston and French Broad	
APPROXIMATE ACREAGE:	201.06 acres	
► ZONING:	A (Agricultural) & RA (Low Density Resid	ential)
EXISTING LAND USE:	Agricultural/Forested/Vacant	
PROPOSED USE:	Detached residential lots	
SURROUNDING LAND USE AND ZONING:	This area is predomininantly developed with residential uses in the A (Agricultural) and R zones. The Ruggle Ferry Golf Club is locate Ruggles Ferry Pike and is developed in the l	single family and rural A (Low Density Residential) d on the south side of N. RA zone.
NUMBER OF LOTS:	475	
SURVEYOR/ENGINEER:	Batson, Himes, Norvell & Poe	
ACCESSIBILITY:	Access is via N. Ruggles Ferry Pike, a majo pavement width within 50-60-FT of right-of-v street with a 13' pavement width within 50-F	r collector street with 24-FT of vay, and Blake Lane, a local T of right-of-way.
SUBDIVISION VARIANCES REQUIRED:	VARIANCES REQUIRING PLANNING COM 1) REDUCE THE VERTICAL CURVE LENG (FROM K=25.0 TO 15.3), STA. 4+75, ROAD 2) REDUCE THE VERTICAL CURVE LENG (FROM K=25.0 TO 15.0), STA. 10+75, ROAD 3) REDUCE THE VERTICAL CURVE LENG (FROM K=25.0 TO 19.2), STA. 12+00, ROAD 4) REDUCE THE VERTICAL CURVE LENG (FROM K=25.0 TO 16.7), STA. 12+00, ROAD ALTERNATIVE DESIGN STANDARDS REG COMMISSION APPROVAL: 1) REDUCE THE MINIMUM HORIZONTAL FT TO 200-FT AT STA 16+10, ROAD "A"	MMISSION APPROVAL: GTH FROM 123-FT TO 75-FT O "A". GTH FROM 225-FT TO 135-FT AD "I". GTH FROM 58.5-FT TO 45-FT AD "I". GTH FROM 75-FT TO 50-FT AD "K". QUIRING PLANNING . CURVE RADIUS FROM 250-

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2) REDUCE THE MINIMUM HORIZONTAL CURVE RADIUS FROM 250-FT TO 150-FT AT STA 0+75, ROAD "C" 3) REDUCE THE MINIMUM HORIZONTAL CURVE RADIUS FROM 250-FT TO 240-FT AT STA 13+00, ROAD "C" 4) REDUCE THE MINIMUM HORIZONTAL CURVE RADIUS FROM 250-FT TO 150-FT AT STA 0+85, ROAD "G" 5) REDUCE THE MINIMUM HORIZONTAL CURVE RADIUS FROM 250-FT TO 145-FT AT STA 9+25, ROAD "G" 6) REDUCE THE MINIMUM HORIZONTAL CURVE RADIUS FROM 250-FT TO 150-FT AT STA 6+00, ROAD "I" 7) REDUCE THE MINIMUM HORIZONTAL CURVE RADIUS FROM 250-FT TO 200-FT AT STA 16+50. ROAD "K" 8) REDUCE THE MINIMUM HORIZONTAL CURVE RADIUS FROM 250-FT TO 150-FT AT STA 14+50, ROAD "M" ALTERNATIVE DESIGN STANDARDS REQUIRING KNOX COUNTY ENGINEERING AND PUBLIC WORKS APPROVAL: 1) INCREASING THE MAXIMUM ROAD GRADE AT INTERSECTIONS FROM 1% TO A MAXIMUM OF 3% 2) REDUCE THE MINIMUM PROPERTY LINE RADIUS FROM 25-T TO 0-FT ON THE EAST SIDE OF ROAD "A" AT ITS INTERSECTION WITH N. **RUGGLES FERRY PIKE**

STAFF RECOMMENDATION:

APPROVE variances 1-4, and alternative design standards 1-8 on the recommendations of the Knox County Department of Engineering and Public Works, and because the site conditions restrict compliance with the Subdivision Regulations and the proposed variances will not create a traffic hazard.

APPROVE the Concept Plan subject to 17 conditions.

1. Connection to sanitary sewer and meeting any other relevant requirements of the utility provider.

2. Provision of street names which are consistent with the Uniform Street Naming and Addressing System within Knox County (County Ord. 91-1-102).

3. Implementation of any street and intersection improvements and recommendations outlined in the Transportation Impact Study prepared by AJAX Engineering, as last revised on February 26, 2021, and approved by the Knox County Department of Engineering and Public Works, City of Knoxville Department of Engineering, Tennessee Department of Transportation (TDOT), and Planning Commission staff. Any recommended improvements to be made by the developer will be determined by the agency with jurisdiction. The design details and timing of the installation of the improvements shall be worked out with the Knox County Department of Engineering and Public Works, City of Engineering, and TDOT during the design plan stage for the subdivision.

4. The second entrance for the development shall be constructed and approved for use prior to the 150th lot for the subdivision being approved through the final plat process.

5. Widening Blake Lane to a minimum width of 20 feet from N. Ruggles Ferry Pike to the Road 'Q' intersection with the final design to be approved by Knox County Engineering and Public Works during the design plan phase.

6. Installing notification of future street connection at the west end of Road 'B' and the east end of Road 'R' as required by Section 3.04.C.2.d. of the Knoxville-Knox County Subdivision Regulations.

7. Providing a note on the plat that the lots along the Holston River must have a minimum finished floor elevation one-foot above the 500-year flood plain as required by Knox County Engineering and Public Works during the design plan phase.

8. Providing a 25' common area on the final plat between Blake Lane and any double frontage lots that have an average depth less than 135 feet.

9. Providing a 25' common area on the final plat between Burris Road and any double frontage lots that have an average depth less than 135 feet.

10. Providing a temporary turnaround at the northern terminus of Blake Lane per the requirements of Knox County Engineering and Public Works and the Knox County Fire Prevention Bureau.

11. Providing the required right-of-way corner radius on the common area lot at the Road 'Q' and Blake Lane intersection unless otherwise approved as an alternative design standard by Knox County Engineering and Public Works during the design plan phase.

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12. Prior to certification of the final plat for the subdivision, establishing a property owners association that will

be responsible for the maintenance of the common areas, recreational amenities, and drainage system.

13. Sidewalks to be installed as required by the Knox County sidewalk ordinance. Sidewalk placement will be determined prior to permitting with Knox County EPW.

14. Meeting all applicable requirements of the Knox County Department of Engineering and Public Works.15. Provide either of the following around the external boundary of the development when adjacent to a platted subdivision or parcels currently used for residential purposes (see the diagram in Exhibit A).

a) Maintain all trees with a minimum 4-inch diameter within 10-FT of the external boundary of the development referenced above. All applicable trees shall be clearly marked and protected to identify the limits of disturbance. Selective removal of trees is permitted that are dead or dying, an invasive species, or must be removed for safety reasons, such as a falling hazard. The tree's diameter shall be measured 4.5-FT above the ground;

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b) All lots within 100-FT of the external boundary of the development referenced above shall have an average lot size of 1-acre, with no lot being less than 30,000 square feet.

16. Provide a minimum of 1.5 acres of publicly accessible land for open space with direct access to the Holston River in consultation with Knox County, per Section 3.12 of the Subdivision Regulations. Any donation to the County is subject to final review and approval by Knox County Parks and Recreation and Knox County EPW prior to approval of the final plat for the first phase of the subdivision. Knox County can decline to accept any donation of land to be managed as part of their park system. If an agreement for publicly accessible land cannot be reached, staff recommends providing an accessible access point to the Holston River for all residents of the development as part of an amenity package managed by the property owner's association, per condition 12.

17. The revised Concept Plan shall be reviewed and approved by Planning Commission staff prior to the issuance of grading permits.

COMMENTS:

PROPOSED DEVELOPMENT SUMMARY

The applicant is proposing to subdivide 201.06 acres into 475 detached residential lots at a density of 2.36 du/ac, and will include approximately 5.2 miles of new streets. The subdivision will have two entrances. The Road 'A' entrance will connect directly to N. Ruggles Ferry Pike and is considered the main entrance to the subdivision. It will have a 12-foot raised median flanked by 18-foot road lanes on each side. The second subdivision entrance will be at the intersection of Blake Lane at N. Ruggles Ferry Pike. Road 'Q' in the subdivision will incorporate a portion of Blake Lane, which will be improved and widened to 20 feet back to N. Ruggles Ferry Pike (approximately 1,000 feet). Blake Lane is currently only 13 feet wide. The property does have frontage on Burris Road, however, no access is proposed to Burris Road.

There are eleven common areas totalling approximately 11.5 acres, with many used for stormwater facilities. Adjacent to the intersection of Road 'G' at Road 'J', the development will have a centralized area with ten parking spaces for mail delivery and pickup for residents and a small area dedicated to a dog park. Adjacent to Road J at Road M, a play area has been identified.

ZONING BACKGROUND

The property was rezoned from A (Agricultural) to RA (Low Density Residential) in January 1988 (1-L-88-RZ). The stated purpose of the rezoning was for residential development and a golf course. The subject site was rezoned at the same time as the Ruggles Ferry Golf Club property (1-M-88-RZ) on the south side of N. Ruggles Ferry Pike. The golf course and 18 house lots were subsequently approved by the Planning Commission in August 1999 (8-SA-99-C / 8-P-99-UR).

The general description of the RA (Low Density Residential) zone is that it "provides for residential areas with low population densities. These areas are intended to be defined and protected from encroachment of uses not performing a function necessary to the residential environment." The RA zone has a minimum lot size of 10,000 sqft and standard setbacks that cannot be modified by the Planning Commission. The Planning Commission can require modifications to the subdivision plan or other improvements that are in keeping with the standards in the subdivision regulations.

SUBDIVISION REGULATIONS

The purpose of the Concept Plan is to provide sufficient information to determine the practicality, suitability, and conformance with regulations of the proposed plan. Article 3 (General Design Standards and Required Improvements) establishes the minimum design and performance standards, including specific standards for lots, access, streets, and sinkholes, and general standards for pedestrian circulation, stormwater management, erosion and sediment control, survey control, guarantee of improvements, utilities, easements, and open

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space. The specific standards are requirements and must receive a variance or alternative design standard approval to deviate from those standards. Examples include road design standards such as right-of-way widths, horizontal and vertical curves, and intersections separation. The size and shape of lots are largely regulated by the applicable zoning standards but the subdivision regulations do have lot frontage and access standards that have to be met. An example of a general standard is for public open spaces (Section 3.12) that states the Planning Commission may require dedication or reservation of usable open space within a subdivision up to a total of 10 percent of the gross area or water frontage for park, school, or recreation purposes. This provision is rarely used because this is specifically speaking to land for public use, not parks for neighborhood residents that are maintained by a homeowners association.

The subdivision regulations do require road stub-outs for future connections to adjoining undivided property. The proposed development includes a stub-out on Road 'B' to the property to the west and on Road 'R' to the property to the east.

TRANSPORTATION IMPACT STUDY

The Transportation Impact Study for Innsbruck Farms (AJAX Engineering, February 2021) is a level 2 study that includes a review of the primary access roads and intersections. The study focused on N. Ruggles Ferry Pike and the two intersections associated with this development (Road 'A' and Blake Lane) and the intersections at Asheville Hwy and Andrew Johnson Hwy. A summary of the study findings is attached to the staff report as Exhibit A, as well as the detailed conclusions and recommendations of the study.

The general findings of the study are that improvements to N. Ruggles Ferry Pike are not warranted at the two entrances to the subdivision (such as turn lanes), traffic signals are warranted with existing traffic volumes at the Asheville Hwy and Andrew Johnson Hwy intersections, additional turn lanes on N. Ruggles Ferry Pike at the Asheville Hwy and Andrew Johnson Hwy are warranted, and other improvements in the TDOT right-of-way to increase turn lane queuing lengths and generally improve turning movements onto the highways.

Turn signals installed on state routes are installed and maintained by the local government. There may be a cost-sharing arrangement for the installation but TDOT does not maintain traffic signals. Knox County Engineering and Public Works stated they do not want to pursue the installation of a traffic signal at the Andrew Johnson Hwy and N. Ruggles Ferry Pike intersection. The City of Knoxville determined they do want to pursue a traffic signal at the Asheville Hwy and N. Ruggles Ferry Pike intersection. The other recommended improvements to those intersections may be pursued but will require coordination between the applicable jurisdiction and TDOT.

UTILITY AVAILABILITY

KUB recently installed a wastewater pump station in this area and it currently has excess capacity and can accommodate this development. KUB requires additional information from the developer in order to determine if the existing water service can be accommodated. These details will be evaluated in more detail during permitting and will be the responsibility of the developer to extend service to the site as required by KUB. If the subdivision is approved, the number of lots that can be developed could be limited during permitting if adequate utility service is not available.

ESTIMATED TRAFFIC IMPACT: A traffic impact study was prepared by the applicant. The findings of that study were used in formulating the recommendations of this staff report.

ESTIMATED STUDENT YIELD: 160 (public school children, grades K-12)

Schools affected by this proposal: Carter Elementary, Carter Middle, and Carter High.

• Potential new school population is estimated using locally-derived data on public school student yield generated by new housing.

• Students are assigned to schools based on current attendance zones as determined by Knox County Schools. Students may request transfers to different zones, and zone boundaries are subject to change.

• Estimates presume full build-out of the proposed development. Build-out is subject to market forces, and timing varies widely from proposal to proposal.

• Student yields from new development do not reflect a net addition of children in schools. Additions occur incrementally over the build-out period. New students may replace current population that ages through the system or moves from the attendance zone.

Knoxville-Knox County Planning Commission's approval or denial of this request is final, unless the action is appealed to Knox County Chancery Court. The date of the Knox County Chancery Court appeal hearing will depend on when the appeal application is filed.

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Name of Applicant: Noxville KNDX COUNTY NOXVILLE KNDX COU	AS IT APPEARS ON THE CURRENT PLANNING COMMISSION GENDA 3-SB-2 -C Review: Jone 10, 2021 Frozi Request Accepted by: Michae (Rem
REQUEST Please postpone the above application(s) until: Dury 8, 2020 Date OF FUTURE PUBLIC MEETING Table Please table the above application(s). Withdraw Please withdraw the above application(s). State reason for request:	PLEASE NOTE Consistent with the guidelines set forth in Planning's Administrative Rules and Procedures: POSTPONEMENTS Any first time (new) Planning application is eligible for one automatic postponement. This request is for 30 days only and does not require Planning approval if received no later than 3:30 p.m. on the Friday prior to the Planning Commission meeting. All other postponement requests must be acted upon by Planning before they can be officially postponed to a future public meeting.
Eligible for Fee Refund? Yes Amount:	TABLINGS Any item requested for tabling must be acted upon by the Planning Commission before it can be officially tabled. WITHDRAWALS Any item is eligible for automatic withdrawal. A request for withdrawal must be received no later than 3:30p.m. on the Friday prior to the Planning Commission meeting. Withdrawal requests that do not meet these guidelines must be acted upon by Planning Commission before they can be officially withdrawn.
PLEASE PRINT BHUP Name: DAVID Harbin Address: 4334 Papermill Dr City: Knoxville State: TH Zip: 3790 Telephone: 8(05-588-6472 Fax: 605-588-6473	Any new item withdrawn may be eligible for a fee refund according to the following: Application withdrawal with fee refund will be permitted only if a written request is received prior to public notice. This request must be approved by either the Executive Director, or the Planning Services Manager. Applications may be withdrawn after this time, but without fee refund.

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Name of Applicant:	AS IT APPEARS ON THE CURRENT PLANNING COMMISSION AGENDA
REGEIMED. Original File Number(s):	3-5B-21-C
MAR 3 0 2021 Date Scheduled for Planning Rev	iew: 4/8/21 m) D 1/
Knoxville-Knox County Date Request Filed: 330	2 Request Accepted by:
Planning	
REQUEST	PLEASE NOTE
Please postpone the above application(s) until:	Administrative Rules and Procedures:
JUN-10 2021	DOSTRONEMENTS
DATE OF FUTURE PUBLIC MEETING	Any first time (new) Planning application is eligible for
🗌 Table	one automatic postponement. This request is for 30 days
Please table the above application(s).	only and does not require Planning approval if received
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Please withdraw the above application(s).	Planning Commission meeting. All other postponement
	requests must be acted upon by Planning before they
State reason for request:	can be officially postponed to a future public meeting.
	TABLINGS
	Any item requested for tabling must be acted upon by the
Eligible for Fee Refund? Yes No	Planning Commission before it can be officially tabled.
Amount:	
Approved by:	
Date:	Any item is eligible for automatic withdrawal. A request for
ADDI ICATION AUTHORIZATION	withdrawal must be received no later than 3:30p.m. on
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applicant's authorized representative.	Withdrawal requests that do not meet these guidelines
Re alline	must be acted upon by Planning Commission before they
Signature: <u>Clane Gunsman</u>	can be officially withdrawn.
PLEASE PRINT	
Name: BLANE CHALISMAN	Any new item withdrawn may be eligible for a fee refund according to the following:
Address: P.O. Box 520	Application withdrawal with fee refund will be permitted
City: Louisville State: TN Zip: 37777	only if a written request is received prior to public notice.
Telephone: 865-603-1509	This request must be approved by either the Executive Director, or the Planning Services Manager. Applications
Fax:	may be withdrawn after this time, but without fee refund.
F-mail: blane cheisman @Mahoo.com	
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	Request to Pos	stpone • Table • Withdraw
	Name of Applicant:R.C	2. Ruggles LLC RECEIVED
	Original File Number(s):	3-5B-21-C MAR 102021
	Date Scheduled for Planning Revi	ew: 3 11 2021 Knoxville-Knox County Planning
	Date Request Filed: 3/16/20	Request Accepted by: Mike Reyns Ids
F	REQUEST	PLEASE NOTE
A Postpone Please postpone the	above application(s) until:	Consistent with the guidelines set forth in Planning's Administrative Rules and Procedures:
April	8 2021	POSTPONEMENTS
	FUTURE PUBLIC MEETING	Any first time (new) Planning application is eligible for
Please table the above	ve application(s).	one automatic postponement. This request is for 30 days
🗌 Withdraw		no later than 3:30 p.m. on the Friday prior to the
Please withdraw the	above application(s).	Planning Commission meeting. All other postponement
State reason for	request:	can be officially postponed to a future public meeting.
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		TABLINGS
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applicant's authorized	representative.	Withdrawal requests that do not meet these guidelines
Signature:	il bl	must be acted upon by Planning Commission before they can be officially withdrawn
Name: David	1 Harbin	Any new item withdrawn may be eligible for a fee refund
Address: 4354	Papermill Dr.	according to the following:
City: Knysville	State: TN Zin: ' 3790.9	Application withdrawal with fee refund will be permitted only if a written request is received prior to public notice
Telephone: 588-	6471	This request must be approved by either the Executive
Fax:		may be withdrawn after this time, but without fee refund.
E-mail: hortor	ahhr-p.com	





















EXHIBIT A





Transportation Impact Study Innsbruck Farms Knox County, Tennessee



Revised February 2021

3-SB-21-C Revised: 2/26/2021



Prepared for: RC Ruggles, LLC 10710 Murdock Drive Knoxville, TN 37932



EXECUTIVE SUMMARY

Preface:

RC Ruggles, LLC is proposing a residential development north of North Ruggles Ferry Road in East Knox County, TN. The name of this proposed residential development is "Innsbruck Farms", and this development will consist of 482 single-family residential houses on 182.8± acres. This development is anticipated to be fully built-out and occupied by the year 2028. This study's primary purpose is to determine and evaluate the potential impacts of the development on the adjacent transportation system. The study includes a review of the primary access roads and intersections and is a Level 2 study as set forth by Knoxville/Knox County Planning. Recommendations and mitigation measures will be offered where transportation operations have been projected to be below recognized engineering standards.

Study Results:

The findings of this study include the following:

- At full build-out and occupancy, the Innsbruck Farms Subdivision with 482 singlefamily residential houses is calculated to generate 4,420 trips on an average weekday. Of these trips, 348 are estimated to occur during the AM peak hour and 460 trips in the PM peak hour in the year 2028.
- This development will have two entrances. One entrance will be constructed on North Ruggles Ferry Pike and create a new t-intersection, and one will be at an existing intersection that will be modified at North Ruggles Ferry Pike at Blake Lane. These intersections are projected in future conditions to operate with minimal delays. The two intersection ends of North Ruggles Ferry Pike at Asheville Highway and Andrew Johnson Highway were examined in the study. Both have been calculated to operate with high vehicle delays currently. Without modifications at these intersections, they are also projected to operate very poorly in the year 2028.



Recommendations:

The following recommendations are offered based on the study analyses. The recommendations are offered to minimize the traffic impacts of the proposed development on the adjacent road system while attempting to achieve an acceptable traffic flow and safety level. The recommendations marked with an asterisk indicate an existing transportation need and are not associated with the proposed development's projected impacts.

- Due to the existing high vehicle delays and meeting traffic signal warrants based on the existing traffic volumes, it is recommended that the intersection of Asheville Highway at North Ruggles Ferry Pike be signalized.
- It is recommended that the existing sign (R3-2) prohibiting westbound left-turns at the intersection of Asheville Highway at North Ruggles Ferry Pike be replaced with a new sign in the interim and supplemented with additional signage (minimum of 2 additional signs) located on the east side median facing westbound traffic. Once the intersection is re-constructed with a traffic signal, this prohibition can be more pronounced by installing a sign on the span wire (or mast arm).
- It is recommended that the intersection of Andrew Johnson Highway at North Ruggles Ferry Pike (West Side) be signalized. This recommendation is offered due to the existing high vehicle delays, unfavorable geometric layout of the intersection, and nearly meeting traffic signal warrants for signalization based on the existing traffic volumes. In the year 2022, traffic signal warrants are expected to be fully met, assuming that the subdivision adds approximately 60 homes in the first year of the development.
 - During the planning phase for a traffic signal at the intersection of Andrew Johnson Highway at North Ruggles Ferry Pike, it is recommended that the eastbound approach of North Ruggles Ferry Pike be examined whether an exclusive right-turn lane should be provided.
- It is recommended that the median nose on the north side of the intersection on Andrew Johnson Highway be modified to help facilitate eastbound left turns from North Ruggles Ferry Pike (West Side).
 - It is recommended that Stop Signs (R1-1) and 24" white stop bars be applied to the pavement of the Road "A" and Blake Lane/Road "Q" approaches at North Ruggles Ferry Pike. The stop bars should be applied at a minimum of 4 feet away from the edge of North Ruggles Ferry Pike and should be placed at the desired stopping point that maximizes sight distance.
 - Intersection sight distance at Road "A" and Blake Lane/Road "Q" must not be



impacted by future landscaping or signage. There is an existing utility pole on the eastern side of the proposed location of Road "A" and a hedgerow on the eastern side of Blake Lane/Road "Q" at North Ruggles Ferry Pike. These existing objects could interfere with sight distance looking towards the east. A licensed land surveyor must verify the available sight distance at these subdivision entrances.

- A passing zone is currently delineated on North Ruggles Ferry Pike's centerline at the proposed entrance locations. Knox County Engineering should determine whether these passing zones should be maintained once the development is constructed.
 - The widening of Blake Lane will require consideration of the pavement interface between the lane and the parking area of an existing church. Pavement striping may be necessary to delineate the roadway from the parking area.
 - It is recommended that 25-mph Speed Limit Signs (R2-1) be posted near the front of both streets, Road "A" and Blake Lane/Road "Q", off North Ruggles Ferry Pike. End of roadway signage (OM4-1) should be installed at the western end of Road "B" and the eastern end of Road "R".
 - Stop Signs (R1-1) and 24" white stop bars should be installed on the new internal streets, as shown in the report.
 - Sight distance at the new internal intersections in the development must not be impacted by new signage or future landscaping. With a speed limit of 25-mph in the development, the intersection sight distance requirement is 250 feet. The stopping sight distance required is 155 feet for a level road grade. The road layout designer should ensure that sight distance lengths are met.
 - All drainage grates and covers for the residential development need to be pedestrian and bicycle safe.
 - Sidewalks are not proposed for this development. If this changes, they should have appropriate ADA-compliant curbed ramps at intersection corners, and the sidewalks are recommended to be 5 feet minimum in width.
 - Traffic calming measures might be needed for this development. Several roads within the development have long and straight road segments. The possible need for traffic calming measures inside the development should be coordinated with Knox County Engineering and Public Works during the detailed design phase.
 - All road grade and intersection elements internally and externally should be designed to AASHTO, TDOT, and Knox County specifications and guidelines to ensure proper operation.



CONCLUSIONS & RECOMMENDATIONS

The following is an overview of recommendations to minimize the traffic impacts of the proposed development on the adjacent road system while attempting to achieve an acceptable traffic flow and safety level. Overall, North Ruggles Ferry Pike's minor approaches at Asheville Highway and Andrew Johnson Highway currently operate with high vehicle delays. The requirement of increasing the tabulated traffic volumes by 20% and distributing all generated trips to each end of North Ruggles Ferry Pike at Asheville Highway and Andrew Johnson Highway resulted in worse Levels of Service and extreme vehicle delays in the projected conditions.

Asheville Highway at North Ruggles Ferry Pike: This intersection was calculated to operate poorly in the existing conditions and worse in the projected conditions in 2028. As an investigation into potential remediation for this intersection, this intersection was examined with respect to traffic signal warrants.

<u>Methodology</u>:

The Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD) presents nine different warrants that have been developed by the traffic engineering profession to determine whether a traffic signal is warranted. These warrants cover a broad range of minimum elements required to indicate whether a traffic signal is justified for any particular location. These elements consist of traffic volumes, pedestrian volumes, crash history, and other factors. The MUTCD explicitly states that a traffic control signal should not be installed unless one or more of the manual's signal warrants are met. However, the satisfaction of a warrant does not entirely in itself justify the need for a traffic signal. Sometimes further engineering studies and judgments also need to be applied before justifying the need for a traffic signal installation. These additional studies are a significant step in ensuring that a traffic signal's installation will not bring about degradations in safety and efficiencies.

The MUTCD defines nine different warrants, two of which are potentially applicable for this intersection at this time and are explained below:



Warrant #1, Eight-Hour Vehicular Volume:

Warrant #1 is comprised of 2 conditions – A and B. The Minimum Vehicular Volume, Condition A, is intended for application where the volume of intersecting traffic is the principal reason for consideration of signal installation. The Interruption of Continuous Traffic, Condition B, is intended for use at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.



Warrant #2, Four-Hour Vehicular Volume:

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Even though nine warrants are offered to justify a traffic signal, according to the TDOT Traffic Signal Manual, the agency gives precedence to Warrant #1 (Eight Hour Vehicular Volume) and Warrant #7 (Crash Experience). Warrant #7 is based on Crash Experience. Even though Warrant #2 is not a primary warrant used by TDOT, it is included in this study. Furthermore, TDOT does not allow installing a traffic signal on a state route based on speculative developments or unrealized traffic volumes.

The intersection of Asheville Highway at North Ruggles Ferry Pike was evaluated for justification for a traffic signal based on the MUTCD Warrants listed above and the existing (+20% adjusted) traffic count volumes. North Ruggles Ferry Pike was used as the minor side street for the warrant analysis, and Asheville Highway was the major street. Warrant #7 was not analyzed at the intersections for this study. Warrant #7 was not included because one of the primary criteria for an intersection to meet the warrant is that an "Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency..." It is not believed that any specific alternatives have been implemented and observed at these intersections; therefore, this warrant was not included in this study.



According to the Federal Highway Administration (FHWA), the traffic signal warrants are intentionally written in a manner that provides a large amount of flexibility to engineers in terms of how they determine the number of moving lanes and the volume of approaching traffic used in the analysis. The decisions about which approach lanes on the major and minor streets and the corresponding traffic volumes are determined by the engineer's judgment conducting the study or by the methods established by local and state agencies. Ultimately, it is up to the reviewing agency to determine whether right-turn volumes from the minor street should be included.

This intersection currently meets Warrant #2 and nearly meets Warrant #1, Condition B, based on the existing traffic volumes with a 20% increase. This determination was made with the analysis including southbound right-turn volumes from North Ruggles Ferry Pike (the minor street approach). Since nearly all southbound traffic volumes from North Ruggles Ferry Pike comprise right-turn movements, it is deemed appropriate to include these traffic movements in the warrant analysis. Furthermore, Warrant #1, Condition B, is satisfied 7 out of the required 8 hours. Only an additional 11 right-turns would have been needed during the 11 am – 12 noon hour for the intersection to meet Warrant #1, Condition B fully, in addition to Warrant #2. Thus, it is appropriate to assume that this intersection can be justified for a traffic signal in the current existing conditions even before the residential subdivision is developed. Appendix I contains the traffic signal warrant assessment at this intersection for the existing 2021 volumes (with a +20% increase).

With the traffic signal warrant analysis indicating that this intersection could be justified to have a traffic signal installed, Synchro Traffic Software (Version 8) was used to design a preliminary traffic signalization plan. A preliminary traffic signal timing design resulted in a much-improved level of service for the intersection based on an optimized actuated-uncoordinated cycle in the AM and PM peak hours. The level of service results for this intersection with this preliminary traffic signal timing is shown in Tables 8a and 8b. Appendix F includes the worksheets for these capacity analyses and presents the initial traffic signal timing plans. Table 8a shows the intersection results of Asheville Highway at North Ruggles Ferry Pike with the existing traffic volumes (+20% increase). Table 8b reports the intersection results in the projected 2028 conditions with the project and generated traffic volumes operating under a traffic signal.



The poor results shown in Table 8b with a traffic signal are based on the directive that all the traffic volumes generated by the development to and from the west of the development are distributed via the Asheville Highway at North Ruggles Ferry Pike intersection without deviation. This scenario requires all subdivision traffic entering from the west to turn left onto North Ruggles Ferry Pike. All subdivision exiting traffic towards the west will turn right onto Asheville Highway. In this scenario, the Level of Service and vehicle delay results are poor in the AM hour, even with a traffic signal. The results are based on an optimized 110-second actuated uncoordinated cycle in the AM and PM peak hours. While the results are unsatisfactory, it is founded on the unreasonable assumption that all the residents would travel to and from the west via this intersection without exception and not seek alternate routes to avoid the high vehicle delays for eastbound leftturns and southbound right-turns at the intersection. In reality, subdivision residents would more likely utilize North Patty Road or Cash Road off North Ruggles Ferry Pike to avoid turning at the intersection and travel thru the intersection on Asheville Highway instead.

It is recommended that further traffic counts be conducted at this intersection when either the pandemic has ended and overall traffic volumes return closer to pre-pandemic levels, or when it is surmised that overall traffic volumes have reached a "new normal". This will allow for a re-examination of the intersection, a re-comparison of the Traffic Signal Warrants, and establish a timeframe of when this intersection could be signalized. TDOT does not allow a traffic signal installation on a state route based on speculative developments or unrealized traffic volumes. This process should be coupled with the knowledge that Innsbruck Farms Subdivision and other future developments along North Ruggles Ferry Pike will be adding vehicle traffic volumes at the intersection in the future conditions. Traffic crash data should also be included in the examination.

With the installation of a traffic signal at the intersection, the vehicle delays would decrease to manageable levels for the minor side street approaches. Without a traffic signal, even without the proposed development, the motorists from the minor side street approaches will continue to experience extensive delays during peak hours. Extreme delays can contribute to motorist impatience and increase reckless driving behavior, leading to traffic incidents.



Any traffic signal design or other remediation should include determining whether the existing eastbound left-turn lane is sufficient in length with a traffic signal. It currently provides 150 feet of storage length. A cursory initial examination of the existing eastbound left-turn volumes (with the additional 20% increase) was made in the Synchro 8 software. The results showed that the 95th percentile queue length was 84 feet in the AM peak hour and 81 feet in the PM peak hour based on the existing (+20%) traffic volumes.

Since this intersection exists on a State Route, TDOT will need to provide direction and guidance to improve this intersection to reduce the considerable existing vehicle delays. The City of Knoxville will also need to be involved since they will assume ownership if a traffic signal is installed since this intersection lies within the city limits. TDOT does not own, operate, or maintain traffic signals, and the responsibility would belong to the local government.

A final recommendation for this intersection is regarding the prohibition of westbound leftturns from Asheville Highway to the Knox Farmers Cooperative parking lot. The existing sign (R3-2) stating this prohibition is dull and faded and should be more authoritatively presented. Several motorists were observed making this prohibited movement. This sign is recommended to be replaced with a new sign in the



(Looking West)

interim and supplemented with additional signage (minimum of 2 additional signs) located in the east median facing westbound traffic. Once the intersection is reconstructed with a traffic signal, this prohibition can be more pronounced by installing a sign on the span wire (or mast arm).

A summary of the recommendations at this intersection is shown in Figure 9a.





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NORTH

Summary of Recommended External Road Improvements - Asheville Highway at North Ruggles Ferry Pike

TABLE 8a 2021 SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS -ASHEVILLE HIGHWAY AT NORTH RUGGLES FERRY PIKE EXISTING TRAFFIC CONDITIONS (+20%)

	TRAFFIC	APPROACH/		AM PEAK			PM PEAK	
INTERSECTION	CONTROL	MOVEMENT	LOS ^a	DELAY ^b	v/c ^c	LOS ^a	DELAY ^b	v/c °
				(seconds)			(seconds)	
Asheville Highway at		Eastbound	А	9.4		А	4.9	
North Ruggles Ferry Pike	zed	Westbound	С	20.3		В	14.4	
	nali	Northbound	А	0.0		С	22.0	
	2; ⁸	Southbound	С	30.1		С	22.0	
		Summary	В	17.7	0.830	А	9.1	0.650

Note: All analyses were calculated in Synchro 8 software and reported with HCM 2000 methodology for signalized intersections Optimized Cycle Length = 75 Seconds

^a Level of Service

^b Average Delay (sec/vehicle)

° Volume-to-Capacity Ratio





TABLE 8b 2028 SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS -ASHEVILLE HIGHWAY AT NORTH RUGGLES FERRY PIKE OPENING YEAR (2028 WITH PROJECT)

	TRAFFIC	APPROACH/		AM PEAK			PM PEAK	
INTERSECTION	CONTROL	MOVEMENT	LOS ^a	DELAY ^b	v/c ^c	LOS ^a	DELAY ^b	v/c °
				(seconds)			(seconds)	
Asheville Highway at		Eastbound	С	26.8		А	8.0	
North Ruggles Ferry Pike	zeq	Westbound	Е	66.5		С	23.9	
	nali	Northbound	А	0.0		D	35.2	
	Sig 🗖	Southbound	F	88.2		D	35.2	
		Summary	Е	57.6	1.030	В	14.9	0.730

Note: All analyses were calculated in Synchro 8 software and reported with HCM 2000 methodology for signalized intersections Optimized Cycle Length = 110 Seconds

^a Level of Service

^b Average Delay (sec/vehicle)

° Volume-to-Capacity Ratio





<u>Andrew Johnson Highway at North Ruggles Ferry Pike (East Side & West Side)</u>: Both approaches of North Ruggles Ferry Pike (East Side and West Side) at Andrew Johnson Highway have been shown to operate very poorly with respect to Level of Service and with extreme vehicle delays in the existing conditions as well as the projected 2028 conditions. There are many operational issues with these existing intersections that will need to be addressed and are outside the impacts produced by the proposed Innsbruck Farms Subdivision.

This existing intersection is laid in out an extremely disadvantageous manner for Both sides of North motorists. Ruggles Ferry Pike intersect Andrew Johnson Highway at a sharp skewed angle of almost 30°. This skew would be unacceptable for а newly constructed intersection. Most roadway design standards indicate intersection angles between 75° and 90° are desirable and angles between 60° and 75° degrees are acceptable. Angles less than 60° are sub-standard and produce operational issues and particularly sight distance issues. Both ends of North Ruggles Ferry Pike at Andrew Johnson Highway are laid out with short lengths of roadway attempting to intersect the highway at a more acceptable angle, albeit for about a single car length.



North Ruggles Ferry Pike (East Side) at Andrew Johnson Highway (Looking East)



North Ruggles Ferry Pike (West Side) at Andrew Johnson Highway (Looking East)



As stated previously, a fair amount of traffic was observed "crossing" Andrew Johnson Highway from one side of North Ruggles Ferry Pike to the other and vice versa. Most of the existing turn movements on each side of North Ruggles Ferry Pike are left-turns onto Andrew Johnson Highway. In the future, it is expected that entering and exiting traffic generated by the proposed subdivision (shown in Figure 6b) will contribute heavily to these volumes. These volume contributions will include left-turns from North Ruggles Ferry Pike (West Side) for travel towards Jefferson City, left-turns from North Ruggles Ferry Pike (West Side) for travel across ("thru") Andrew Johnson Highway to the other side of North Ruggles Ferry Pike (East Side) and vice versa. It was also previously shown that the existing level of service for these approaches of North Ruggles Ferry Pike is extremely poor with high vehicle delays.

The intersection of Andrew Johnson Highway at North Ruggles Ferry Pike (West Side) was also examined with respect to traffic signal warrants based on MUTCD Warrants for the existing (+20% adjusted) traffic volumes. Only North Ruggles Ferry Pike (West Side) was examined since the North Ruggles Ferry Pike (East Side) intersection has significantly fewer minor street volumes. For the traffic signal warrant analysis, North Ruggles Ferry Pike (West Side) was the minor side street, and Andrew Johnson Highway was the major street.

The analysis concluded that for the existing (+20% adjusted) traffic volumes, the intersection does not meet Warrant #1 or Warrant #2 even though the Level of Service calculations determined that the minor approaches at this intersection currently operate at LOS F during the AM and PM peak hour.

There are no easy or simple solutions for the existing conditions to reduce vehicle delays for this intersection. Remediation for the existing intersection is impeded due to many factors that include road geometrics, potentially limited right-of-way, many existing private driveways, and large thru volumes on Andrew Johnson Highway. Adding separate left-turn lanes on each side of North Ruggles Ferry Pike at Andrew Johnson Highway would decrease the delays for right-turn movements but will do little to decrease delays overall.

Since easily offered remediation is not readily apparent for this intersection, the intersection was re-examined with respect to traffic signal warrants. As stated previously,



TDOT does not typically accept justification for traffic signals except for Warrant #1 and #7. Warrant #7 was not examined for this study. Adding a traffic signal at this location would decrease vehicle delays for the minor street approach and potentially improve safety by reducing unprotected left-turns into the high thru volume streams on Andrew Johnson Highway. Another warrant, Warrant #3, is an alternative method to justify a traffic signal at this location. Warrant #3 is usually only used in rare instances such as locations near office complexes, manufacturing plants, etc. According to the MUTCD, Warrant #3 "is intended for use at a location where traffic suffers undue delay when entering or crossing the major street."

Warrant #3, Condition A, was met for the intersection of Andrew Johnson Highway at North Ruggles Ferry Pike (West Side) for the existing (+20% adjusted) traffic volumes. Appendix I shows the traffic signal warrant assessment at this intersection for the existing volumes of 2021 (with a +20% increase).

Outside of allowing the intersection to be currently signalized based on meeting Warrant #3, the intersection was further analyzed to determine when the volumes would justify a traffic signal based on Warrant #1. A spreadsheet was developed to determine the traffic volumes generated by the development being added to the intersection of Andrew Johnson Highway at North Ruggles Ferry Pike (West Side) based on the traffic distribution shown previously. This spreadsheet is provided in Appendix I. It is estimated that this intersection will meet Warrant #1, Condition B, and Warrant #2 in the year 2022. This estimation is based on the existing (+20%) traffic volumes and assuming a linear growth of home construction and occupancy in the subdivision over the seven years (slightly over 60 houses per year). This small length of time from not meeting Warrant #1 and #2 to potentially meeting the warrants is due to assuming the development will add 60 homes with residents with a subsequent 631 generated daily trips in the first year of construction (2022). Distributing and assigning a portion of those new trips at the intersection results in meeting the warrant thresholds.

With the traffic signal warrant analysis indicating that this intersection could be justified to have a traffic signal installed, Synchro Traffic Software (Version 8) was used to design a preliminary traffic signalization plan. A preliminary traffic signal timing design resulted in a much-improved level of service for the intersection based on an optimized



actuated-uncoordinated cycle in the AM and PM peak hours. The level of service results for this intersection with this preliminary traffic signal timing is shown in Tables 9a and 9b. Appendix F includes the worksheets for these capacity analyses and presents the initial traffic signal timing plans. Table 9a shows the intersection results of Andrew Johnson Highway at North Ruggles Ferry Pike with the existing traffic volumes (+20% increase). Table 9b reports the intersection results in the projected 2028 conditions with the project and generated traffic volumes operating under a traffic signal.

The results shown in Table 9b are based on the directive that all the traffic volumes generated by the development to and from the east of the development be distributed via the Andrew Johnson Highway at North Ruggles Ferry Pike (West Side) intersection without deviation. Unlike the opposite end of North Ruggles Ferry Pike at Asheville Highway, it is expected and reasonable to believe that all traffic to and from the east of the development will travel through this intersection since there are no sensible alternative routes of travel or shortcuts. As observed in the manual traffic counts, there is a reasonable amount of traffic that travels from North Ruggles Ferry Pike towards Jefferson City and across ("thru") Andrew Johnson Highway towards Strawberry Plains Pike and vice versa. The manual traffic count observation was documented evidence of an existing traffic pattern, which would be expected to continue and increase when new trips are generated from the subdivision in the future.

Similar to the previous recommendations for the intersection of Asheville Highway at North Ruggles Ferry Pike, it is recommended that further traffic counts be conducted again at this intersection when either the pandemic has ended and overall traffic volumes return closer to pre-pandemic levels, or when it is surmised that overall traffic volumes have reached a "new normal". TDOT does not allow a traffic signal installation on a state route based on speculative developments or unrealized traffic volumes. This will allow for a re-examination of the intersection, a re-comparison of the Traffic Signal Warrants, and establish a timeframe of when this intersection could be signalized. Traffic crash data should also be included in the examination.

Also, during the planning phase for a traffic signal at the intersection of Andrew Johnson Highway at North Ruggles Ferry Pike, it is recommended that the eastbound approach of North Ruggles Ferry Pike be examined whether an exclusive right-turn lane should be provided. Adding an exclusive lane would allow for the separation of left and right-turn



movements.

With the installation of a traffic signal at the intersection, the vehicle delays would decrease to manageable levels for the minor side street approaches. Without a traffic signal, even without the proposed development, the motorists from the minor side street approaches will continue to experience considerable delays during peak hours. High delays can contribute to motorist impatience and increase reckless driving behavior, leading to traffic incidents.

Any traffic signal design or other remediation should include determining whether the existing northbound left-turn lane is sufficient in length with a traffic signal. It currently provides 75 feet of storage length. A cursory initial examination of the existing northbound left-turn volumes (with the additional 20% increase) was made in the Synchro 8 software. The results showed that the 95th percentile queue length was 20 feet in the AM peak hour and 24 feet in the PM peak hour based on the existing (+20%) traffic volumes.

Since this intersection exists on a State Route, TDOT will need to provide direction and guidance to improve this intersection to reduce the considerable existing vehicle delays. Knox County will also need to be involved since they will assume ownership if a traffic signal is installed since this intersection lies within the county limits. TDOT does not own, operate, or maintain traffic signals, and the responsibility would belong to the local government.

The intersection of Andrew Johnson Highway at North Ruggles Ferry Pike (East Side) was not included in the proposed preliminary traffic signal recommendation for the Andrew Johnson Highway at North Ruggles Ferry Pike (West Side). The exclusion is due to North Ruggles Ferry Pike (East Side) having significantly lower traffic volumes and operating as a t-intersection with fewer conflicting movements than the 4-way intersection of North Ruggles Ferry Pike (West Side). Installing a traffic signal at North Ruggles Ferry Pike (West Side) would create significantly more traffic gaps to allow for westbound turning movements from North Ruggles Ferry Pike (East Side). To incorporate both these intersections under a unified, coordinated traffic signal control would require careful consideration and could result in additional vehicle delays and reduced capacities since these two intersections are separated by approximately 250 feet. For this design to work correctly and safely at this location, the turning movements on North Ruggles Ferry Pike



(West Side) and the turning movements on North Ruggles Ferry Pike (East Side) would require creative traffic signal phasing and timing.

A final note and recommendation for the Andrew Johnson Highway at North Ruggles Ferry Pike (West Side) intersection is the existing north side median nose. For eastbound left-turns from North Ruggles Ferry Pike (West Side) towards the north onto Andrew Johnson Highway, an extra lane is provided in the median that allows for temporary refuge and space to allow for vehicle acceleration to merge into the traffic stream.



However, the existing median nose is extremely prohibitive to allowing this turn. The median nose is blunt and does not facilitate left-turns onto the highway and reduces the potential usefulness of the extra lane in the median. It is recommended that this median nose be modified to help facilitate eastbound left turns from North Ruggles Ferry Pike (West Side).

A summary of the recommendations at this intersection is shown in Figure 9b.



TABLE 9a 2021 SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS -ANDREW JOHNSON HIGHWAY AT NORTH RUGGLES FERRY PIKE (WEST SIDE) EXISTING TRAFFIC CONDITIONS (+20%)

	TRAFFIC	APPROACH/		AM PEAK			PM PEAK	
INTERSECTION	CONTROL	MOVEMENT	LOS ^a	DELAY ^b	v/c °	LOS ^a	DELAY ^b	v/c °
				(seconds)			(seconds)	
Andrew Johnson Highway at		Eastbound	С	22.4		С	20.9	
North Ruggles Ferry Pike	zed	Westbound	А	0.0		В	18.9	
(West Side)	nali	Northbound	А	2.7		А	3.8	
	B B	Southbound	А	4.0		А	3.2	
		Summary	Α	4.5	0.550	А	4.3	0.530

Note: All analyses were calculated in Synchro 8 software and reported with HCM 2000 methodology for signalized intersections Optimized Cycle Length = 55 Seconds

^a Level of Service

^b Average Delay (sec/vehicle)

^c Volume-to-Capacity Ratio





TABLE 9b 2028 SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS -ANDREW JOHNSON HIGHWAY AT NORTH RUGGLES FERRY PIKE (WEST SIDE) OPENING YEAR (2028 WITH PROJECT)

	TRAFFIC	APPROACH/		AM PEAK			PM PEAK	
INTERSECTION	CONTROL	MOVEMENT	LOS ^a	DELAY ^b	v/c °	LOS ^a	DELAY ^b	v/c °
				(seconds)			(seconds)	
Andrew Johnson Highway at		Eastbound	С	24.6		С	21.1	
North Ruggles Ferry Pike	zeq	Westbound	А	0.0		В	16.5	
(West Side)	nali	Northbound	А	5.9		А	8.1	
	Sig 🖸	Southbound	В	10.3		А	7.0	
		Summary	В	10.3	0.740	А	8.7	0.660

Note: All analyses were calculated in Synchro 8 software and reported with HCM 2000 methodology for signalized intersections Optimized Cycle Length = 60 Seconds

^a Level of Service

^b Average Delay (sec/vehicle)

^c Volume-to-Capacity Ratio







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FIGURE 9b

Innsbruck Farms

NORTH

Summary of Recommended External Road Improvements - Andrew Johnson Highway at North Ruggles Ferry Pike North Ruggles Ferry Pike at Blake Lane / Road "Q": The intersection of North Ruggles Ferry Pike at Blake Lane / Road "Q" was calculated to operate very well with respect to level of service in the projected conditions in 2028.

- 3a) A separate exiting left-turn lane or right-turn lane on Blake Lane/Road "Q" at North Ruggles Ferry Pike is not required based on the projected 2028 traffic volumes.
- 3b) Separate eastbound or westbound lanes on North Ruggles Ferry Pike for entering traffic into the subdivision at Blake Lane/Road "Q" are not warranted.
- 3c) It is recommended that a Stop Sign (R1-1) and a 24" white stop bar be applied to the pavement of the Blake Lane/Road "Q" approach at North Ruggles Ferry Pike. The stop bar should be applied at a minimum of 4 feet away from the edge of North Ruggles Ferry Pike and should be placed at the desired stopping point that provides the maximum sight distance. An existing Stop Sign (R1-1) currently exists on this north approach but will need to be relocated to widen Blake Lane/Road "Q".
- 3d) Intersection sight distance at Blake Lane/Road "Q" must not be impacted by future landscaping or signage. Based on a posted speed limit of 40-mph on North Ruggles Ferry Pike, the required intersection sight distance (ISD) is 400 feet looking in each direction at the intersection of North Ruggles Ferry Pike at Blake Lane/Road "Q". Based on an existing 4% grade on North Ruggles Ferry Pike at Blake Lane/Road "Q" and a posted speed limit of 40-mph, the SSD is calculated to be 285 feet for eastbound and 325 feet for westbound vehicles. There is an existing hedgerow on the eastern side of Blake Lane/Road "Q" at North Ruggles Ferry Pike. This hedgerow could interfere with sight distance looking towards the east. This hedgerow will need to be maintained regularly. A licensed land surveyor must verify the available sight distance at this proposed subdivision entrance.
- 3e) A passing zone for both directions is currently delineated on North Ruggles Ferry Pike's centerline at this proposed entrance location. Knox County Engineering should determine whether this location should maintain this passing zone once the development is constructed with the new entrances.



3f) There is a small church located on the northwestern corner of this intersection. The parking lot for this church abuts Blake Lane. The widening of Blake will require Lane consideration of the pavement interface between the lane and the parking area of the church. Pavement striping may be necessary to delineate the roadway from the parking area.





3 North Ruggles Ferry Pike at Road "A": The intersection of North Ruggles Ferry Pike at Road "A" was calculated to operate very well with respect to level of service in the projected conditions in 2028.

- 4a) A separate exiting left-turn lane or right-turn lane on Road "A" at North RugglesFerry Pike is not required based on the projected 2028 traffic volumes.
- 4b) Separate eastbound or westbound lanes on North Ruggles Ferry Pike for entering traffic into the subdivision at Road "A" are not warranted.
- 4c) It is recommended that a Stop Sign (R1-1) and a 24" white stop bar be applied to the pavement of the Road "A" approach at North Ruggles Ferry Pike. The stop bar should be applied at a minimum of 4 feet away from the edge of North Ruggles Ferry Pike and should be placed at the desired stopping point that provides the maximum sight distance.
- 4d) Intersection sight distance at Road "A" must not be impacted by future landscaping or signage. Based on a posted speed limit of 40-mph on North Ruggles Ferry Pike, the required intersection sight distance (ISD) is 400 feet looking in each direction at the intersection of North Ruggles Ferry Pike at and Road "A". Based on an existing 4% grade on North Ruggles Ferry Pike at Road "A" and a posted speed limit of 40-mph, the SSD is calculated to be 325 feet for eastbound and 285 feet for westbound vehicles. There is an existing utility pole on the eastern side of the proposed location of Road "A" at North Ruggles Ferry Pike. This pole could interfere with sight distance looking towards the east. This pole may be removed or relocated to construct Road "A". A licensed land surveyor must verify the available sight distance at this proposed subdivision entrance.
- 4e) A passing zone for eastbound traffic is currently delineated on North Ruggles Ferry Pike's centerline at this proposed entrance location. Knox County Engineering should determine whether this location should maintain this passing zone once the development is constructed.



5 <u>Innsbruck Farms Internal Roads</u>: The current concept plan shows twenty-one new roads being constructed within the development, as shown in Figure 3.

5a) It is recommended that 25-mph Speed Limit Signs (R2-1) be posted near the front of both new streets, Road "A" and Blake Lane/Road "Q", off North Ruggles Ferry Pike. End of roadway signage (OM4-1) should be installed at the western end of Road "B" and the eastern end of Road "R". Stop Signs (R1-1) with 24" white stop bars and other traffic signage should be installed at the locations, as shown below:





- 5b) Sight distance at the new internal intersections in the development must not be impacted by new signage or future landscaping. With a speed limit of 25-mph in the development, the intersection sight distance requirement is 250 feet. The stopping sight distance required is 155 feet for a level road grade. The road layout designer should ensure that sight distance lengths are met.
- 5c) All drainage grates and covers for the residential development need to be pedestrian and bicycle safe.
- 5d) Sidewalks are not proposed for this development. If this changes, they should have appropriate ADA-compliant curbed ramps at intersection corners, and the sidewalks are recommended to be 5 feet minimum in width.
- 5e) Traffic calming measures might be needed for this development. Several roads within the development have long and straight road segments. The possible need for traffic calming measures inside the development should be coordinated with Knox County Engineering and Public Works during the detailed design phase.
- 5f) It is a long-standing practice by Knox County that residential subdivisions provide secondary outlets when developments exceed 150 lots. Providing two entrances will spread the load of entering and exiting vehicles. The two entrances, Road "A" and Blake Lane/Road "Q" will be spaced approximately 1,300 feet apart and are not expected to interfere with traffic operations at one another. The Knox County requirement for intersection spacing on a collector road is 300 feet. The spacing between Road "A" and Burris Road is 565 feet. The spacing between Blake Lane/Road "Q" and Burris Road is 735 feet.
- 5g) All road grade and intersection elements internally and externally should be designed to AASHTO, TDOT, and Knox County specifications and guidelines to ensure proper operation.



Planning KNOXVILLE I KNOX COUNTY	Development Development Plan Planned Development Use on Review / Special Hillside Protection COA	Use	ept Plan Plat	Plan Amendment SP C OYP Rezoning
RC RUGGLES, LLC Applicant Name			Affiliation	
1-21-21	3-11-21			File Number(s)
Date Filed	Meeting Date (if applicabl	le)	3-5B-	21-C
CORRESPONDENCE All	correspondence related to this app	lication should be dire	ected to the approve	d contact listed below.
□ Applicant □ Owner □ Opt David Harbin	ion Holder 🛛 Project Surveyor	🔳 Engineer 🛛 / Batson, Himes, I	Architect/Landscape Norvell & Poe	Architect
Name		Company		
4334 Papermill Drive		Knoxville	TN	37909
Address	1999 - 1999 -	City	State	ZIP
865-588-6472	harbin@bhn-p.com		_	
Phone	Email			
CURRENT PROPERTY INFO		the second s		
c/o Blaine Cristman	10710 Murda	ock Drive 3793	2 86	5-603-1509
Owner Name (if different)	Owner Address	<u></u>	Own	ner Phone
O N Ruggles Ferry Pike et. al.	MAP 60	PARCELS 200	01. 21. 27. 30	8 34
Property Address	PIN 52	Parcel ID	MAP 52NB	parcel 1
кив	KUB		3	Ν
Sewer Provider	Water P	rovider		Septic (Y/N)
STAFF LISE ONLY				
N/S Ruggles ter	Sig, WE north of	Blake J.	n 171.83 Tract Size	8 acre Mapy
	A RA Zoning District	7 Existing	Vacant Land Use	
E the t	IDRI	HP	P	Panuel

East County Planning Sector

Sector Plan Land Use Classification

Growth Policy Plan Designation

December 2020

Residential Non-Residential	oecial Use 🔲 Hillside Protection COA	Related City P	ermit Number(s)
Other (specify)			
SUBDIVISION REQUEST		Related Bezon	ing File Number
Innsbruck Farms		incluted hezor	ing the transet
Proposed Subdivision Name	482		
Unit / Phase Number	Divide Parcel Total Number of Lot	s Created	
Other (specify)			
Attachments / Additional Requirements			
ZONING REQUEST			
ZONING REQUEST	and the second	Pending Pla	t File Number
Zoning Change Proposed Zoning			
] Plan Amendment Change			
Proposed Plan	Designation(s)		
Proposed Density (units/acre)	Previous Rezoning Requests		
_ Other (specify)			
STAFF USE ONLY			
	Fee 1		Total
STAFF USE ONLY LAT TYPE Staff Review Planning Commission	Fee 1	8 500.00	Total
STAFF USE ONLY LAT TYPE Staff Review Planning Commission TTACHMENTS Property Owners / Option Holders	riance Request	8 500.00	Total
STAFF USE ONLY PLAT TYPE Staff Review Planning Commission ATTACHMENTS Property Owners / Option Holders ADDITIONAL REQUIREMENTS	riance Request	8 500.00 ot	Total
STAFF USE ONLY PLAT TYPE Staff Review Planning Commission ATTACHMENTS Property Owners / Option Holders Van ADDITIONAL REQUIREMENTS Design Plan Certification (Final Plat) Use on Beview / Special Use (Concept Plan)	riance Request Fee 1 Fee 2	8 500.00 ot 14,460.00	Total
STAFF USE ONLY PLAT TYPE Staff Review Planning Commission ATTACHMENTS Property Owners / Option Holders ADDITIONAL REQUIREMENTS Design Plan Certification (<i>Final Plat</i>) Use on Review / Special Use (<i>Concept Plan</i>) Traffic Impact Study	riance Request Fee 1 Fee 2 #30/0 X483 Fee 3	8 500.00 ot 14,460.00	Total
STAFF USE ONLY PLAT TYPE Staff Review Planning Commission ATTACHMENTS Property Owners / Option Holders Van ADDITIONAL REQUIREMENTS Design Plan Certification (Final Plat) Use on Review / Special Use (Concept Plan) Traffic Impact Study COA Checklist (Hillside Protection)	riance Request Fee 1 Fee 2 #30/1 X4783 Fee 3	8 500.00 ot 14,460.00 \$14	Total
STAFF USE ONLY PLAT TYPE Staff Review Planning Commission ATTACHMENTS Property Owners / Option Holders Van ADDITIONAL REQUIREMENTS Design Plan Certification (Final Plat) Use on Review / Special Use (Concept Plan) Traffic Impact Study COA Checklist (Hillside Protection) AUTHORIZATION By signing below,	riance Request # 30/0 # 30/0 X 4/8 3 Fee 3 Fee 3	8 500.00 of 14,460.00 \$ 14	Total
STAFF USE ONLY PLAT TYPE Staff Review Planning Commission ATTACHMENTS Property Owners / Option Holders Van ADDITIONAL REQUIREMENTS Design Plan Certification (Final Plat) Use on Review / Special Use (Concept Plan) Traffic Impact Study COA Checklist (Hillside Protection) AUTHORIZATION By signing below,	riance Request Fee 2 #30/0 X4783 Fee 3 Fee 3	8 500.00 of 14,460.00 \$ 14 tor the owners authorized re 1/21/2	Total
STAFF USE ONLY STAFF USE ONLY LAT TYPE Staff Review Planning Commission STACHMENTS Property Owners / Option Holders Van DDITIONAL REQUIREMENTS Design Plan Certification (Final Plat) Use on Review / Special Use (Concept Plan) Traffic Impact Study COA Checklist (Hillside Protection) AUTHORIZATION By signing below, pplicant Signature	riance Request Fee 1 Fee 2 #30/0 X483 Fee 3 Fee 3 I certify I am the property owner, applican Davi d Hawow Please Print	8 500.00 of $14,460.00$ 4/4 tor the owners authorized re 1/21/2 Date	Total
STAFF USE ONLY PLAT TYPE Staff Review Planning Commission ATTACHMENTS Property Owners / Option Holders Va ADDITIONAL REQUIREMENTS Design Plan Certification (Final Plat) Design Plan Certification (Final Plat) Design Plan Certification (Final Plat) COA Checklist (Hillside Protection) AUTHORIZATION By signing below, Applicant Signature 8465-588-6472	Fee 1 Priance Request Fee 2 Fee 2 Fee 2 Fee 2 Fee 3 Fee 3	8 500.00 of 14,460.00 \$ 14 tor the owners authorized re 1/21/2 Date	Total
STAFF USE ONLY PLAT TYPE Staff Review Planning Commission TTACHMENTS Property Owners / Option Holders Va ADDITIONAL REQUIREMENTS Design Plan Certification (Final Plat) Use on Review / Special Use (Concept Plan) Traffic Impact Study COA Checklist (Hillside Protection) AUTHORIZATION By signing below, AUTHORIZATION By signing below, AUTHORIZATION AUTHORIZATION By signing below, AUTHORIZATION AUTHORIZATIO	Fee 1 Field 010° Field 300° Field 300°	8 500.00 of 14,460.00 \$ 14 tor the owners authorized re 112112 Date	Total



KGIS - Property Map and Details Report Parcel 052 02601 - Property Map and Details Report



Address Information

0 BLAKE LN Site Address: STRAWBERRY PLAINS - 37871

Address Type:

UNUSED LAND

Site Name:

Please contact Knoxville-Knox County Planning at (865) 215-2500 if you have questions.

KNOX COUNTY

Jurisdiction Information

County: City / Township:

Political Districts

Voting Precinct:	86	
Voting Location:		Carter Elementary School 8455 STRAWBERRY PLAINS PIKE
TN State House:	19	Dave Wright
TN State Senate:		Becky Duncan Massey
County Commission: (at large seat 10) (at large seat 11)		Richie Beeler Larsen Jay Justin Biggs
School Board:		Mike McMillan
Please contact Knox County E	lection	Commission at (865) 215-2480 if yo

Property Information

Parcel ID:	052 02601
Location Address:	0 BLAKE LN
CLT Map:	52
Insert:	
Group:	
Condo Letter:	
Parcel:	26.01
Parcel Type:	NORMAL
District:	58
Ward:	
City Block:	
Subdivision:	GREENBELT APP #A- 467
Rec. Acreage:	0
Calc. Acreage:	122.90
Recorded Plat:	·22)
Recorded Deed:	20120912 - 0016678
Deed Type:	Deed:Gift Deed
Deed Date:	9/12/2012

Owner Information

THE FAMILY TRUST OF UNDER WILL OF ARTHUR A BLAKE
2302 FLENTWOOD DR
SARASOTA, FL 34238
The owner information shown in this section does not necessarily reflect the person(s) responsible for Last Year's property taxes. Report any error to the Knox County Property Assessor's office at (865) 215-2365.
Knoxville-Knox Co. Planning Information

53.01 Census Tract: Planning Sector: East County Please contact Knoxville-Knox County Planning at (865) 215-2500 if you have questions.

School Zones

Elementary:	CARTER ELEMENTARY
Intermediate:	
Middle:	CARTER MIDDLE
High:	CARTER HIGH

Please contact Knox County Schools Transportation and Zoning Department at (865) 594-1550 if you have questions.

have questions.

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KGIS - Property Map and Details Report Parcel 052 026 - Property Map and Details Report



Address Information

Site Address:	908 BLAKE LN STRAWBERRY PLAINS - 37871
Address Type:	DWELLING, SINGLE-FAMILY

Site Name: Please contact Knoxville-Knox County Planning at (865) 215-2500 If you have questions.

Jurisdiction Information

County: City / Township:

KNOX COUNTY

Political Districts

Voting Precinct:	86	
Voting Location:		Carter Elementary School 8455 STRAWBERRY PLAINS PIKE
TN State House:	19	Dave Wright
TN State Senate:	6	Becky Duncan Massey
County Commission: (at large seat 10) (at large seat 11)	8	Richie Beeler Larsen Jay Justin Biggs
School Board:	8	Mike McMillan
Please contact Knox County E have questions.	lectio	n Commission at (865) 215-2480 if you

Property Information

Parcel ID:	052 026
Location Address:	908 BLAKE LN
CLT Map:	52
Insert:	
Group:	
Condo Letter:	
Parcel:	26
Parcel Type:	NORMAL DISJ
District:	58
Ward:	
City Block:	
Subdivision:	
Rec. Acreage:	19.22
Calc. Acreage:	0
Recorded Plat:	=
Recorded Deed:	567 - 570
Deed Type:	Deed:Special Wa
Deed Date:	1/19/1932

Owner Information

BLAKE JESSIE MAE % SHIRLEY W BLAKE 2302 FLENTWOOD DR

SAROSOTA, FL 34238

The owner information shown in this section does **not** necessarily reflect the person(s) responsible for Last Year's property taxes. Report any errors to the Knox County Property Assessor's office at (865) 215-2365.

Knoxville-Knox Co. Planning Information

Census Tract:	53.01
Planning Sector:	East County
Please contact Knoxville- have questions.	Knox County Planning at (865) 215-2500 if you

School Zones

Elementary:	CARTER ELEMENTARY
Intermediate:	
Middle:	CARTER MIDDLE
High:	CARTER HIGH

Please contact Knox County Schools Transportation and Zoning Department at (865) 594-1550 if you have questions.

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KGIS - Property Map and Details Report Parcel 052 027 - Property Map and Details Report



Address Information

Site Address: 0 BURRIS RD STRAWBERRY PLAINS - 37871

Address Type:

Site Name:

Please contact Knoxville-Knox County Planning at (865) 215-2500 if you have questions.

UNUSED LAND

Jurisdiction Information

County: City / Township:

KNOX COUNTY

Political Districts

Voting Precinct:	86	
Voting Location:		Carter Elementary School 8455 STRAWBERRY PLAINS PIKE
TN State House:	19	Dave Wright
TN State Senate:	6	Becky Duncan Massey
County Commission: (at large seat 10) (at large seat 11)	8	Richie Beeler Larsen Jay Justin Biggs
School Board:	8	Mike McMillan
Please contact Knox County E bave questions.	lectio	Commission at (865) 215-2480 if you

Property Information

Parcel ID:	052 027
Location Address:	0 BURRIS RD
CLT Map:	52
Insert:	
Group:	
Condo Letter:	
Parcel:	27
Parcel Type:	NORMAL
District:	58
Ward:	
City Block:	
Subdivision:	GREENBELT APP #A- 469
Rec. Acreage:	19
Calc. Acreage:	20.50
Recorded Plat:	-
Recorded Deed:	1198 - 459
Deed Type:	Deed:Special Wa
Deed Date:	3/10/1962

Owner Information

BLAKE PAUL F & JESSIE MAE % SHIRLEY W BLAKE 2302 FLENTWOOD DR

SAROSOTA, FL 34238

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Knoxville-Knox Co. Planning Information

Census Tract:	53.01
Planning Sector:	East County
Please contact Knoxville- have questions.	Knox County Planning at (865) 215-2500 if you

School Zones

CARTER ELEMENTARY	
CARTER MIDDLE	
CARTER HIGH	
	CARTER ELEMENTARY CARTER MIDDLE CARTER HIGH

Please contact Knox County Schools Transportation and Zoning Department at (865) 594-1550 if you have questions.

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KGIS - Property Map and Details Report

Parcel 052 032 - Property Map and Details Report



Address Information

Site Address:	8621 N RUGGLES FERRY PIKE STRAWBERRY PLAINS - 37871
Address Type:	DWELLING, SINGLE-FAMILY
Site Name:	

Please contact Knoxville-Knox County Planning at (865) 215-2500 if you have questions.

Jurisdiction Information

County: City / Township:

KNOX COUNTY

Political Districts

Voting Precinct:	76	
Voting Location:		Sunnyview School 412 BAGWELL RD
TN State House:	19	Dave Wright
TN State Senate:	6	Becky Duncan Massey
County Commission: (at large seat 10) (at large seat 11)	8	Richie Beeler Larsen Jay Justin Biggs
School Board:	8	Mike McMillan
Disease and the state of the st	Inchier	Commission at (REE) 31E-3490 if

Please contact Knox County Election Commission at (865) 215-2480 if you have questions.

Property Information

Parcel ID:	052 032
Location Address:	8621 N RUGGLES FERRY PIKE
CLT Map:	52
Insert:	
Group:	
Condo Letter:	
Parcel:	32
Parcel Type:	NORMAL
District:	S8
Ward:	
City Block:	
Subdivision:	
Rec. Acreage:	3
Calc, Acreage:	0
Recorded Plat:	-
Recorded Deed:	1427 - 177
Deed Type:	Deed:Special Wa
Deed Date:	4/16/1970

Owner Information

VANCE HELEN E
8621 RUGGLES FERRY RD
STRAWBERRY PLAINS, TN 37871

The owner information shown in this section does **not** necessarily reflect the person(s) responsible for Last Year's property taxes. Report any errors to the Knox County Property Assessor's office at (865) 215-2365.

Knoxville-Knox Co. Planning Information

Census Tract:	53.01
Planning Sector:	East County
Please contact Knoxville- have guestions.	<nox (865)="" 215-2500="" at="" county="" if="" planning="" td="" you<=""></nox>

School Zones

Elementary:	CARTER ELEMENTARY
Intermediate:	
Middle:	CARTER MIDDLE
High:	CARTER HIGH

Please contact Knox County Schools Transportation and Zoning Department at (865) 594-1550 if you have questions.

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KGIS - Property Map and Details Report

Parcel 052 034 - Property Map and Details Report



Address Information

Site Address: 0 N RUGGLES FERRY PIKE STRAWBERRY PLAINS - 37871 Address Type: UNUSED LAND

Site Name:

Please contact Knoxville-Knox County Planning at (865) 215-2500 if you have questions.

KNOX COUNTY

Jurisdiction Information

County: City / Township:

n.

Political Districts

Voting Precinct:	76	
Voting Location:		Sunnyview School 412 BAGWELL RD
TN State House:	19	Dave Wright
TN State Senate:	6	Becky Duncan Massey
County Commission: (at large seat 10) (at large seat 11)	8	Richie Beeler Larsen Jay Justin Biggs
School Board:	8	Mike McMillan

Please contact Knox County Election Commission at (865) 215-2480 if you have questions.

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Property Information

Parcel ID:	052 034
Location Address:	0 N RUGGLES FERRY PIKE
CLT Map:	52
Insert:	
Group:	
Condo Letter:	
Parcel:	34
Parcel Type:	NORMAL
District:	S8
Ward:	
City Block:	
Subdivision:	GREENBELT APP #A- 468
Rec. Acreage:	37.37
Calc. Acreage:	0
Recorded Plat:	×
Recorded Deed:	635 - 155
Deed Type:	Deed:Special Wa
Deed Date:	1/17/1942

Owner Information

BLAKE PAUL F & JESSIE MAE % SHIRLEY W BLAKE 2302 FLENTWOOD DR

SAROSOTA, FL 34238

The owner information shown in this section does **not** necessarily reflect the person(s) responsible for Last Year's property taxes. Report any errors to the Knox County Property Assessor's office at (865) 215-2365.

Knoxville-Knox Co. Planning Information

Census Tract:	53.01
Planning Sector:	East County
Please contact Knoxville- bave cuestions.	Knox County Planning at (865) 215-2500 if you

School Zones

Elementary:	CARTER ELEMENTARY
Intermediate:	
Middle:	CARTER MIDDLE
High:	CARTER HIGH

Please contact Knox County Schools Transportation and Zoning Department at (865) 594-1550 If you have questions. KGIS - Property Map and Details Report

Parcel 052NB001 - Property Map and Details Report



Address Information

Site Address:	8605 N RUGGLES FERRY PIKE STRAWBERRY PLAINS - 37871
Address Type:	DWELLING, SINGLE-FAMILY
Site Name:	LIVONA ACRES
Please contact Knoxville have questions.	-Knox County Planning at (865) 215-2500 if you

Jurisdiction Information

County: KNOX COUNTY City / Township:

Political Districts

Voting Precinct:	76	
Voting Location:		Sunnyview School 412 BAGWELL RD
TN State House:	19	Dave Wright
TN State Senate:	6	Becky Duncan Massey
County Commission: (at large seat 10) (at large seat 11)	8	Richie Beeler Larsen Jay Justin Biggs
School Board:	8	Mike McMillan
	4	C

Please contact Knox County Election Commission at (865) 215-2480 if you have questions.

Property Information

Parcel ID:	052NB001
Location Address:	8605 N RUGGLES FERRY PIKE
CLT Map:	52
Insert:	N
Group:	В
Condo Letter:	
Parcel:	1
Parcel Type:	NORMAL
District:	S8
Ward:	
City Block:	
Subdivision:	LIVONA ACRES UNIT
Rec. Acreage:	0
Calc. Acreage:	
Recorded Plat:	
Recorded Deed:	20201218 - 0049818
Deed Type:	Deed:Full Coven
Deed Date:	12/18/2020

Owner Information

LIVONA ACRES LLC 770 GREENGABLE LN

POWELL, TN 37849

The owner information shown in this section does **not** necessarily reflect the person(s) responsible for Last Year's property taxes. Report any errors to the Knox County Property Assessor's office at (865) 215-2365.

Knoxville-Knox Co. Planning Information

Census Tract:	53.01
Planning Sector:	East County
Please contact Knoxville- have questions.	Knox County Planning at (865) 215-2500 if you

School Zones

Elementary:	CARTER ELEMENTARY
Intermediate:	
Middle:	CARTER MIDDLE
High:	CARTER HIGH

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