



SUBDIVISION REPORT - CONCEPT/DEVELOPMENT PLAN

► FILE #:	1-SF-23-C	AGENDA ITEM #:	22
	1-E-23-DP	AGENDA DATE:	2/9/2023
POSTPONEMENT(S):	1/12/2023		
► SUBDIVISION:	BEELER ROAD SUBDIVISION		
► APPLICANT/DEVELOPER:	MESANA INVESTMENTS - BEELER ROAD		
OWNER(S):	Mesana Investments, LLC		
TAX IDENTIFICATION:	29 188.03	View map on KGIS	
JURISDICTION:	County Commission District 8		
STREET ADDRESS:	0 BEELER RD		
► LOCATION:	East and west side of Beeler Rd, south of Beeler Farms Ln		
SECTOR PLAN:	Northeast County		
GROWTH POLICY PLAN:	Planned Growth Area		
WATERSHED:	Beaver Creek		
► APPROXIMATE ACREAGE:	27.539 acres		
► ZONING:	PR (Planned Residential)		
► EXISTING LAND USE:	Agriculture/Forestry/Vacant Land		
► PROPOSED USE:	Attached and detached residential subdivision		
SURROUNDING LAND USE AND ZONING:	North: Single family residential -- PR (Planned Residential) South: Single family residential, rural residential, agriculture/forestry/vacant -- A (Agricultural) East: Agriculture/forestry/vacant -- PR (Planned Residential) West: Agriculture/forestry/vacant, rural residential, single family residential -- PR (Planned Residential), A (Agricultural)		
► NUMBER OF LOTS:	90		
SURVEYOR/ENGINEER:	David Harbin; Batson, Himes, Norvell and Poe		
ACCESSIBILITY:	Access is via Beeler Road, a minor collector street with 19 ft of pavement width within 40 ft of right-of-way.		
► SUBDIVISION VARIANCES REQUIRED:	VARIANCES 1. Reduce the minimum vertical curve on Road 'A' from K=25 to K=15 at STA 0+75 ALTERNATIVE DESIGN STANDARDS REQUIRING KNOXVILLE-KNOX COUNTY PLANNING COMMISSION APPROVAL 1. Reduce the minimum horizontal curve radius from 250' to 150' at STA 2+25 on Road 'D' ALTERNATIVE DESIGN STANDARDS REQUIRING KNOX COUNTY		

ENGINEERING AND PUBLIC WORKS APPROVAL

**** See the Requested Variances and Alternative Design Standards memo attached to the staff report.**

STAFF RECOMMENDATION:

- ▶ **Postpone the concept plan until the March 9, 2023 Planning Commission meeting as requested by the applicant.**

- ▶ **Postpone the development plan until the March 9, 2023 Planning Commission meeting as requested by the applicant.**

COMMENTS:

SUMMARY

This proposal is an 90-lot residential subdivision on 27.539 acres at a density of 3.27 du/ac. This includes 87 attached residential lots on the east side of Beeler Road and 3 detached residential lots on the west side of Beeler Road. The property was rezoned from A (Agricultural) to PR (Planned Residential) up to 3.3 du/ac in June 2022 (5-L-22-RZ). The new internal roads will be public with 26-ft of pavement within a 50-ft right-of-way. Road 'D' will extend to the east property boundary to provide access to the Fairview Road Subdivision approved in December 2022 (11-SA-22-C / 11-A-22-DP). The Beeler Road Subdivision and Fairview Road Subdivision are being developed by the applicant and are intended to be the same subdivision when platted.

PREVIOUS APPROVAL

The previously approved B&B Builders subdivision (7-SA-22-C / 7-A-22-UR) had 86 total dwelling units, with 83 attached house lots and 3 detached house lots. A walking trail was provided around the large detention pond under the TVA powerline easement in the southwest portion of the property, and another trail to the existing pond on the north side of Road 'A', between Road 'B' and Road 'C'. The Planning Commission also added a condition to extend the walking trail in the southwest corner of the property to the large property to the south (parcel 029 186) to provide pedestrian access between the properties, since a road connection or greenway easement was not proposed or required at that time.

PROPOSED MODIFICATIONS

The subdivision layout remains relatively unchanged. The only significant changes are extending Road 'D' to the eastern property line and adding 4 lots to the east of the stream on Road 'D' (lots 44-47). The walking trails around the detention pond and existing pond are removed from the plan.

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.

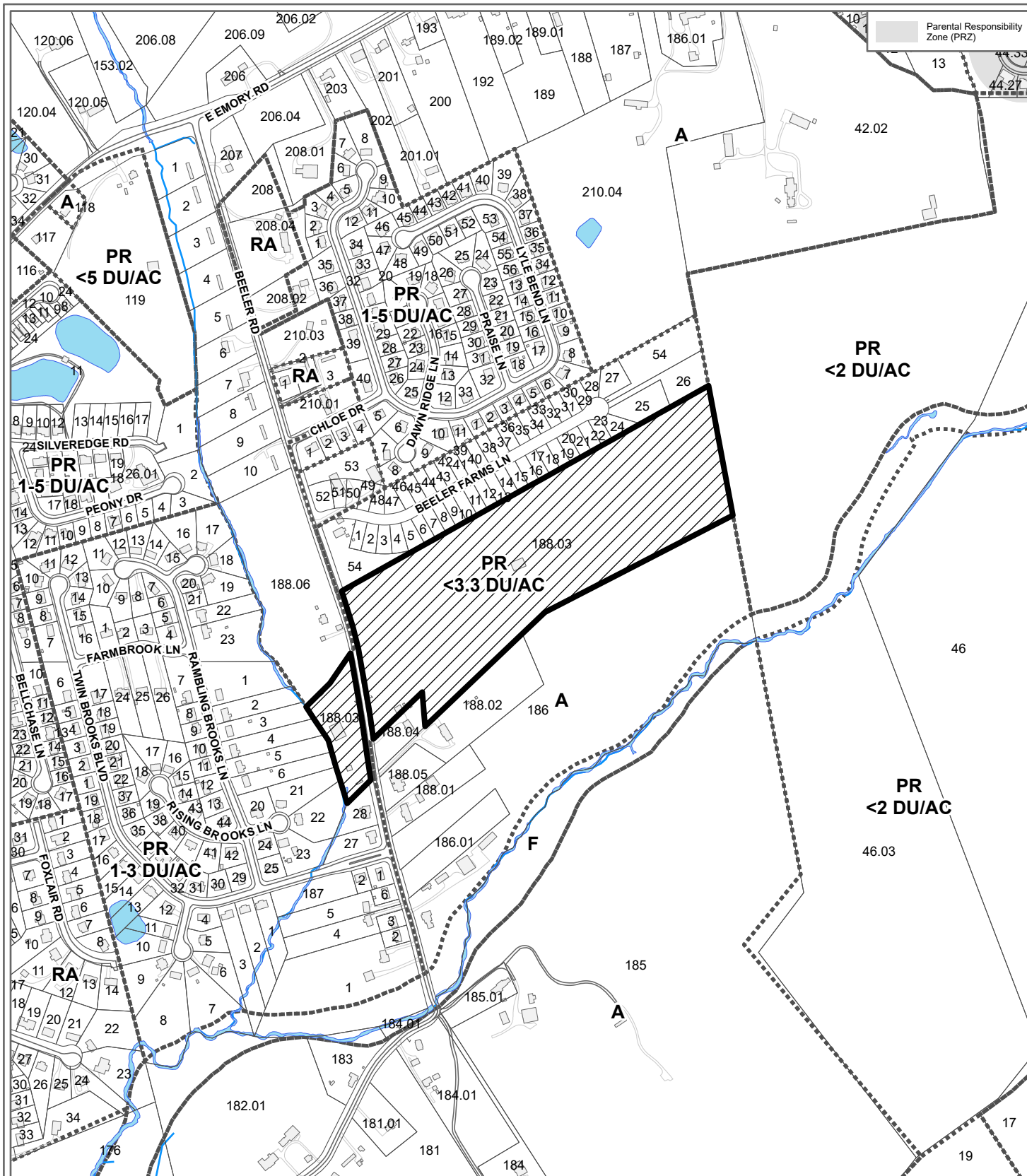
ESTIMATED STUDENT YIELD: 6 (public school children, grades K-12)

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

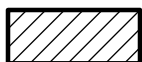
- Potential new school population is estimated using locally-derived data on public school student yield generated by new housing.
- Students are assigned to schools based on current attendance zones as determined by Knox County Schools. Students may request transfers to different zones, and zone boundaries 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 concept plan request is final, unless the action is appealed to Knox County Chancery Court. The date of the Knox County Chancery Court hearing will depend on when the appeal application is filed.

The Planning Commission's approval or denial of this development plan request is final, unless the action is appealed either to the Board of Zoning Appeals or to a court of competent jurisdiction within thirty (30) days of the decision being appealed (Knox County, Tennessee Code of Ordinances, Appendix A, Zoning, 6.50.08).



**1-SF-23-C / 1-E-23-DP
CONCEPT PLAN/DEVELOPMENT PLAN**



Detached residential subdivision in PR (Planned Residential)

Original Print Date: 12/19/2022 Revised:
Knoxville - Knox County Planning Commission * City / County Building * Knoxville, TN 37902

Petitioner: Mesana Investments - Beeler Road

Map No: 29
Jurisdiction: County

0 620
Feet





Request to Postpone • Table • Withdraw

Mesana Investments, LLC

2/3/23

Applicant Name (as it appears on the current Planning Commission agenda)

Date of Request

2/9/23

Scheduled Meeting Date

File Number(s)

1-SF-23-C / 1-E-23-DP

POSTPONE

☒ **POSTPONE:** All applications are eligible for postponement if the request is received in writing and paid for by noon on Thursday the week prior to the Planning Commission meeting. All requests must be acted upon by the Planning Commission, except new applications which are eligible for one 30-day automatic postponement. If payment is not received by the deadline, the item will be tabled.

SELECT ONE: ☒ 30 days ☐ 60 days ☐ 90 days

Postpone the above application(s) until the 3/9/23 Planning Commission Meeting.

WITHDRAW

☐ **WITHDRAW:** Applications may be withdrawn automatically if the request is received in writing no later than 3:30pm on Thursday the week prior to the Planning Commission meeting. Requests made after this deadline must be acted on by the Planning Commission. Applicants are eligible for a refund only if a written request for withdrawal is received no later than close of business 2 business days after the application submittal deadline and the request is approved by the Executive Director or Planning Services Manager.

TABLE

**The refund check will be mailed to the original payee.*

☐ **TABLE:** Any item requested for tabling must be acted upon by the Planning Commission before it can be officially tabled. There is no fee to table or untable an item.

AUTHORIZATION

By signing below, I certify I am the property owner, and/or the owners authorized representative.

Applicant Signature

Scott Davis

Please Print

(865) 693-3356

swd444@gmail.com

Phone Number

Email

STAFF ONLY

Staff Signature

Michael Reynolds

Please Print

PENDING

Date Paid

☐ No Fee

Eligible for Fee Refund? ☐ Yes ☐ No

Amount:

Approved by:

Date:

Payee Name

Payee Phone

Payee Address

Requested Variances & Alternative Design Standards

1-SF-23-C / 1-E-23-DP– MESANA INVESTMENTS – BEELER ROAD

VARIANCES

1. Reduce the minimum vertical curve on Road 'A' from K=25 to K=15 at STA 0+75

ALTERNATIVE DESIGN STANDARDS REQUIRING KNOXVILLE-KNOX COUNTY PLANNING COMMISSION APPROVAL

1. Reduce the minimum horizontal curve radius from 250' to 150' at STA 2+25 on Road 'D'

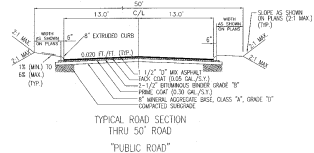
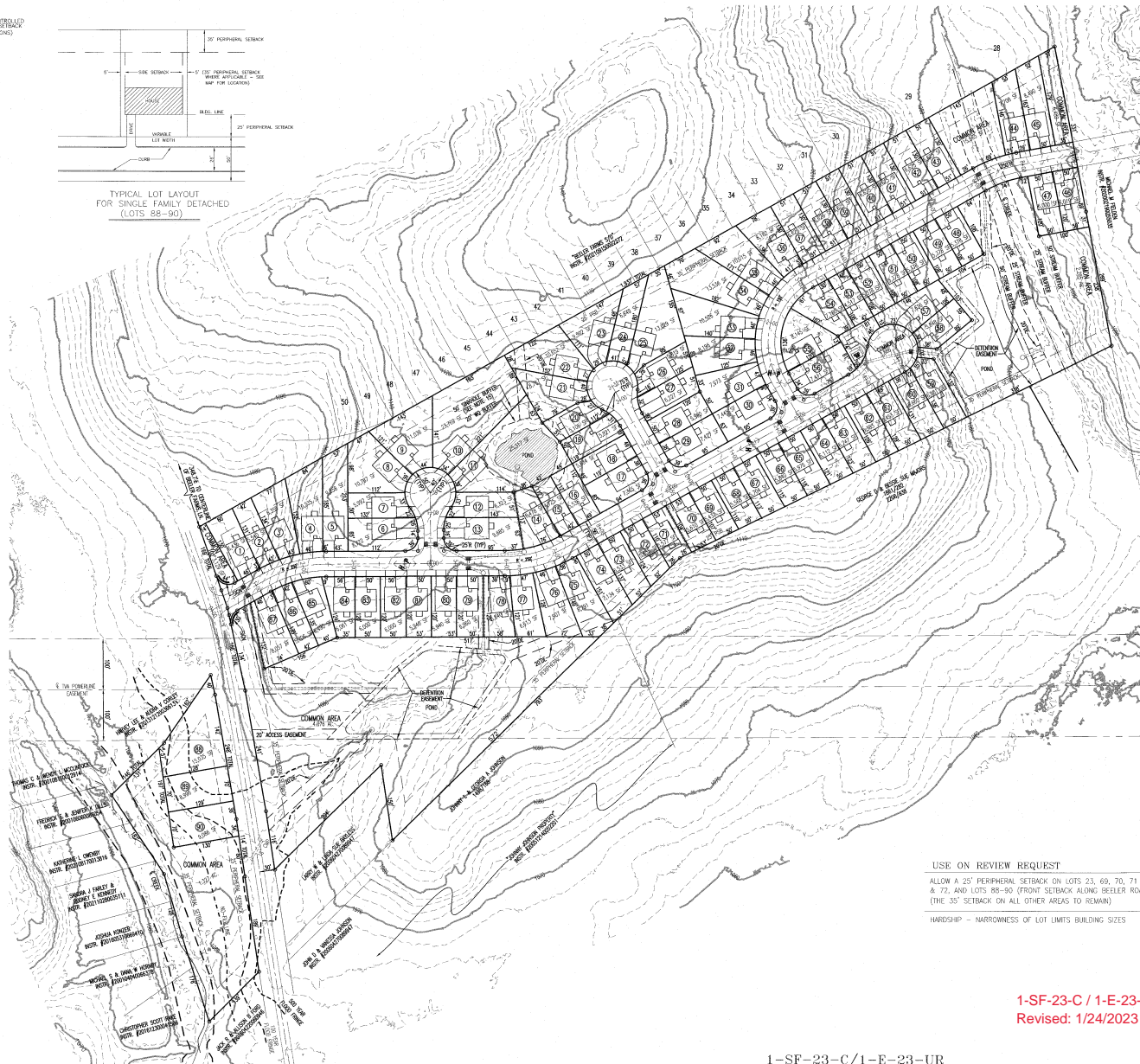
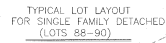
ALTERNATIVE DESIGN STANDARDS REQUIRING KNOX COUNTY ENGINEERING AND PUBLIC WORKS APPROVAL

1. Increase the maximum intersection grade from 1% to 3% on Road 'A' at Beeler Road
2. Increase the maximum intersection grade from 1% to 3% on Road 'B' at Road 'A'
3. Increase the maximum intersection grade from 1% to 2% on Road 'C' at Road 'A'
4. Increase the maximum intersection grade from 1% to 3% on Road 'D' at Road 'A'

KNOX COUNTY ENGINEERING AND PUBLIC WORKS RECOMMENDATION:

Approve.
  1/3/23

* The maximum intersection grade is 2% when there is a pedestrian crosswalk.



ALLOW A 25' PERIPHERAL SETBACK ON LOTS 23, 69, 70, 71
& 72, AND LOTS 88-90 (FRONT SETBACK ALONG BEELER ROAD).
(THE 35' SETBACK ON ALL OTHER AREAS TO REMAIN)

HARDSHIP - NARROWNESS OF LOT LIMITS BUILDING SIZES

1-SF-23-C/1-E-23-UR

NOTES:

- [illegible]



CERTIFICATION OF CONCEPT PLAN BY REGISTERED ENGINEER.

I HEREBY CERTIFY THAT I AM A REGISTERED ENGINEER, LICENSED TO PRACTICE ENGINEERING UNDER THE LAWS OF THE STATE OF TENNESSEE. I FURTHER CERTIFY THAT THE PLAN AND ACCOMPANYING DRAWINGS, DOCUMENTS AND STATEMENTS CONFORM TO THE BEST OF MY KNOWLEDGE, TO ALL APPLICABLE PROVISIONS OF THE KANSAS-KANSAS COUNTY SUBDIVISION ACT AND THE KANSAS-KANSAS COUNTY SUBDIVISION ACT, AND THAT THE PLAN IS PREPARED AND DESCRIBED IN A REPORT FILED WITH THE KANSAS-KANSAS COUNTY SUBDIVISION COMMISSION.

Dwight B. Hill

PROFESSIONAL ENGINEER

TENNESSEE LICENSE NO. 101265 DATE: 1/24/23

DEVELOPER
MESANA INVESTMENTS
c/o SCOTT DAVIS
P.O. BOX 11315
KNOXVILLE, TN 37922
PHONE: (865) 806-8008

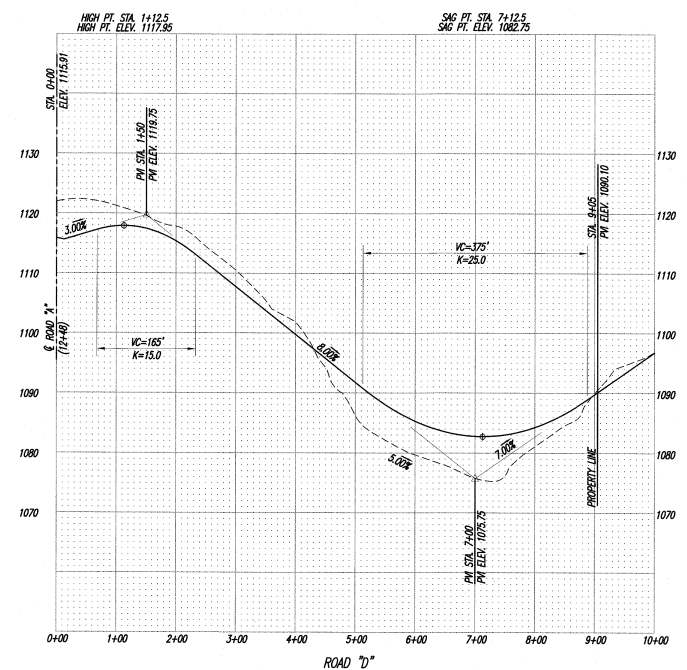
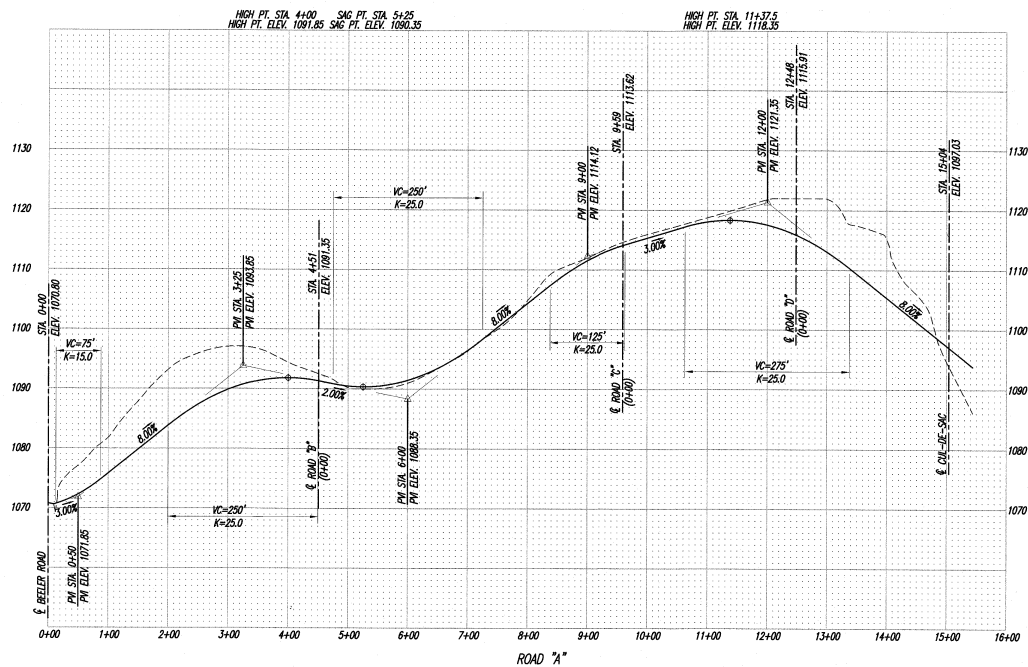
OWNER
B&B BUILDERS
c/o JASON BAKER
P.O. BOX 71233
KNOXVILLE, TN 37938
PHONE: (865) 607-3326

1-SF-23-C / 1-E-23-DP
Revised: 1/24/2023

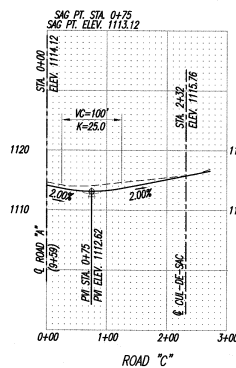
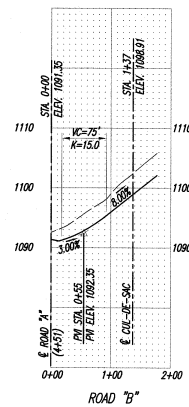
CONCEPT & DEVELOPMENT PLAN FOR
MESANA INVESTMENTS-BEELER ROAD
TAX MAP 29, PART OF PARCEL 188.03
DISTRICT 6, KNOX COUNTY, TENNESSEE

25418-C

OF
2 SHEET(S)
D:\25418\25418-C.DWG



Horizontal Scale = 1:100
Vertical Scale = 1:10



OWNER
LARRY W. & LINDA SUE BAYLESS
SHAD MEIER RD
KNOXVILLE, TN 37918
PHONE: (865) 588-6472

DEVELOPER
B&B BUILDERS
c/o JASON BAKER
P.O. BOX 11233
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PHONE: (865) 607-3326

1-SF-23-C / 1-E-23-DP
Revised: 1/24/2023

 BATSON, HIMES, NORVELL & POE REGISTERED ENGINEERS & LAND SURVEYORS 4334 PAPERMILL DRIVE KNOXVILLE, TENNESSEE 37909 PHONE: (865) 588-6472 FAX: (865) 588-6473 email@bhn-rp.com	DESIGNED DBH DRAWN TPD CHECKED DBH DATE 1/24/23 DATE 1/26/23 REVISION APPR NO DATE REVISION APPR	SCALE AS NOTED DATE 11/20/22	ROAD PROFILES FOR B&B BUILDERS-BEELER ROAD TAX MAP 29, PART OF PARCEL 188.03 DISTRICT 6, KNOX COUNTY, TENNESSEE	25418-RP SHEET 2 OF 2 SHEET(S) 03\25418\25418-C.DWG
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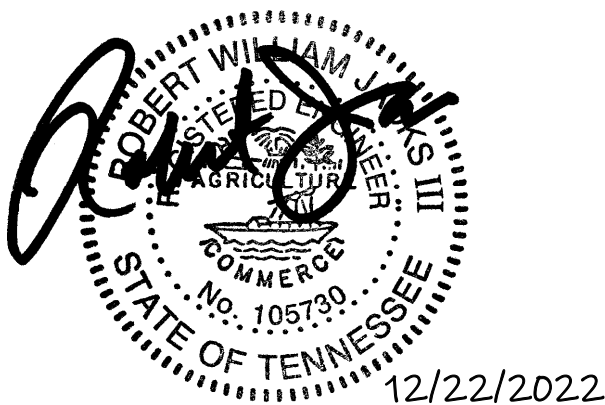


Transportation Impact Study Fairview Road Subdivision & Beeler Road Subdivision Knox County, Tennessee



Revised December 22, 2022

Prepared for:
Eagle Bend Development
Attn: Scott Davis
P.O. Box 11315
Knoxville, TN 37939



1-SF-23-C / 1-E-23-DP
and revision to:
11-SA-22-C / 11-A-22-DP
(subdivisions combined)

Version Date: 12/22/2022

CONCLUSIONS & RECOMMENDATIONS

The following is an overview of recommendations to minimize the transportation impacts of the proposed Fairview Road Subdivision with the other adjacent subdivisions on the transportation system while attempting to achieve an acceptable traffic flow and safety level.



Beeler Road at Beeler Farms Lane: The projected 2027 level of service calculations for this intersection resulted in excellent LOS and low vehicle delays. The construction of left and right-turn lanes on Beeler Road for entering traffic into Beeler Farms Subdivision at Beeler Farms Lane is not warranted. The single exit lane on Beeler Farms Lane at Beeler Road will be sufficient for the residents of Beeler Farms Subdivision.



Beeler Road at Beeler Road Subdivision Entrance: The projected 2027 level of service calculations for this intersection resulted in excellent LOS and low vehicle delays. The construction of left and right-turn lanes on Beeler Road for entering traffic into the Beeler Road Subdivision is not warranted. The single exit lane on the Beeler Road Subdivision entrance at Beeler Road will be sufficient for the residents of the Beeler Road Subdivision and the Fairview Road Subdivision.

- 2a) It is recommended that a Stop Sign (R1-1) be installed, and a 24" white stop bar be applied to the Beeler Road Subdivision entrance approach at Beeler Road. This Stop Sign (R1-1) and stop bar will control the exiting motorists from both Beeler Road and Fairview Road Subdivisions at Beeler Road. The stop bar should be applied a minimum of 4 feet away from the edge of Beeler Road and placed at the desired stopping point that maximizes the sight distance.
- 2b) Sight distances at the Beeler Road Subdivision entrance approach must not be impacted by future landscaping, signage, or vegetation. A visual inspection determined that the intersection and stopping sight distances are available. Based on a posted speed limit of 25-mph on Beeler Road, the required intersection sight distance is 250 feet looking in each direction at each entrance. The stopping sight distance is calculated to be 155 feet to the north and the south at the Beeler Road Subdivision entrance location. The site designer must ensure that these sight distances are accounted for and provided in the design plans.

- 2c) Knox County requires specific minimum spacing between intersecting streets. Beeler Road is designated as a Major Collector at the new and proposed entrance locations on Beeler Road, and the minimum intersection spacing is 300 feet.

The proposed spacing between the proposed entrance road for Beeler Road Subdivision and Beeler Farms Lane in Beeler Farms Subdivision will be approximately 500 feet from centerline to centerline, greater than the Knox County minimum.



East Emory Road at Beeler Road: The existing 2022 and projected 2027 level of service calculations for the intersection of East Emory Road at Beeler Road resulted in extremely high vehicle delays for the northbound approach of Beeler Road in the AM and PM peak hours.

- 3a) The previous Transportation Impact Study (TIS) for the adjacent proposed Beeler Road Subdivision recommended an eastbound right-turn lane with a storage length of 25 feet and a taper length of 75 feet on East Emory Road at Beeler Road. This eastbound right-turn lane is expected to be constructed as an interim remediation before the TDOT project widens East Emory Road from 2 to 5 lanes. When East Emory Road is reconstructed, this eastbound right-turn lane can be absorbed into one of the new thru lanes, and a separate right-turn lane will not be required when the TDOT project is completed in 2030. Providing an eastbound right-turn lane prior to the reconstruction will slightly reduce the vehicle queue and delay for northbound motorists on Beeler Road attempting to turn left and right onto East Emory Road.
- 3b) As determined in this study and the TIS for the Beeler Road Subdivision, a westbound left-turn lane on East Emory Road at Beeler Road was warranted based on the existing and projected traffic volumes. However, it was determined in the previous TIS that the construction of a westbound left-turn lane would not be critically needed at this time. Any construction to install a “temporary” westbound left-turn lane on East Emory Road will be shortly replaced by the TDOT widening project. In the interim, a “No Passing on Shoulder” (R4-18) sign was recommended in the previous study to be installed on East Emory Road. This recommendation was offered to address the illegal movements committed by some motorists occasionally using the shoulder to pass stopped westbound left-turning vehicles on East Emory Road at Beeler Road.

All the calculated high vehicle delays at this intersection are projected to only occur for the northbound motorists on Beeler Road attempting to turn left and right on East Emory Road. Providing a temporary westbound left-turn lane at this time would only primarily benefit westbound thru vehicles on East Emory Road since they would not be impeded by stopped vehicles attempting to turn left onto Beeler Road. Westbound left turns from East Emory Road onto Beeler Road were calculated to operate with low vehicle delays in the existing and projected 2027 conditions. Some safety benefits would be provided if a left-turn lane on East Emory Road were provided at this time, but it would not provide significant vehicle delay reductions for this movement since it is


directly correlated to the number of opposing vehicles and is calculated with good LOS and low vehicle delays.

- 3c) The northbound approach of Beeler Road in 2027 was projected to operate with extremely high delays for the left and right-turning motorists. In addition to the recommended eastbound right-turn lane on East Emory Road from the previous TIS, it is recommended that a northbound right-turn lane with 100 feet of storage on Beeler Road be constructed. The existing and projected right turns at the northbound approach of Beeler Road at East Emory Road are much higher than left turns. Adding an exclusive right-turn lane on this approach would reduce delays for most northbound motorists. Several right-turning motorists on Beeler Road were observed during the traffic count using the shoulder to bypass vehicles waiting to turn left onto East Emory Road and avoid the delay. If not constructed, it is anticipated that more right-turning motorists will be tempted to use the shoulder to avoid excessive delays and queues. The recommended eastbound and northbound right-turn lanes at this intersection should be coordinated in design and construction to reduce costs and construction time. These lanes should be constructed once the Beeler Road and Fairview Road Subdivisions commence construction to provide additional road capacity and moderate vehicle delays and queues until the TDOT widening project is completed. The northbound right-turn lane on Beeler Road should be marked with a white turn arrow and lane markings, as shown in TDOT Standard Drawing T-M-4.

Separate left and right lanes at unsignalized intersections operating under stop conditions can be an issue due to motorists' potential to compete for sight distance. However, with the existing horizontal alignment on East Emory Road, it is anticipated that a northbound right-turn lane on Beeler Road could be constructed to allow left and right-turning motorists to see oncoming vehicles on East Emory Road in both directions freely without being obstructed by other vehicles.

Adding a northbound right-turn lane on Beeler Road would reduce the overall intersection delay and the excessive queue lengths on the northbound approach by spreading the vehicles into two lanes. The LOS calculation results of adding a northbound right-turn lane on Beeler Road with the previously recommended eastbound right-turn lane on East Emory Road in the projected 2027 conditions are shown in Table 10. The worksheets for these results are provided in Appendix F.

TABLE 10
2027 INTERSECTION CAPACITY ANALYSIS RESULTS -
PROJECTED TRAFFIC CONDITIONS (WITH THE PROJECT)
INCLUDING RECOMMENDED EASTBOUND AND NORTHBOUND RIGHT-TURN LANES

INTERSECTION	TRAFFIC CONTROL	APPROACH/ MOVEMENT	AM PEAK			PM PEAK		
			LOS	DELAY (seconds)	V/C	LOS	DELAY (seconds)	V/C
East Emory Road (EB & WB) at Beeler Road (NB)	 Unsignalized	Northbound Left	F	108.8	0.769	F	611.8	1.912
		Northbound Right	C	16.0	0.389	C	19.5	0.354
		Westbound Left/Thru	A	8.9	0.074	B	11.2	0.217

Note: All analyses were calculated in Synchro 11 software and reported using HCM 2010 intersection methodology

^a Level of Service

^b Average Delay (sec/vehicle)

^c Volume-to-Capacity Ratio

Since the projected northbound left-turn lane is computed to remain at LOS F even with the addition of an eastbound and northbound right-turn lane, the projected vehicle queues were calculated. An additional software program was used to calculate the projected 2027 AM and PM peak hour vehicle queues at the studied intersection with the addition of the recommended eastbound and northbound right-turn lanes. The previously mentioned Synchro Traffic Software includes SimTraffic. The Synchro portion of the software performs the macroscopic calculations for intersections, and SimTraffic performs micro-simulation and animation of vehicular traffic. SimTraffic (Version 11) software was utilized to estimate the projected vehicle queues.

The 95th percentile vehicle queue is the recognized measurement in the traffic engineering profession as the design standard used when considering vehicle queue lengths. A 95th percentile vehicle queue length means 95% certainty that the vehicle queue will not extend beyond that point. The calculated vehicle queue results were based on averaging the outcome obtained during ten traffic simulations. The calculated 95th percentile vehicle queue lengths at the intersection for the 2027 projected conditions with an eastbound and northbound right-turn lane are shown in Table 11. The vehicle queue worksheet results from the SimTraffic software are in Appendix J. As shown in Table 11, the longest vehicle queues will occur in the PM peak hour. In particular, the longest northbound left-turn queue is calculated to be 145 feet. Thus, even though the northbound left-turn lane will experience high vehicle delays, as shown in Table 10, the calculated 95th percentile queue is projected to be just under six passenger cars, assuming a length and spacing of 25 feet per vehicle.

TABLE 11
TURN LANE STORAGE & VEHICLE QUEUE SUMMARY -
2027 PROJECTED TRAFFIC CONDITIONS (WITH THE PROJECT)
INCLUDING RECOMMENDED EASTBOUND AND NORTHBOUND RIGHT-TURN LANES

INTERSECTION	APPROACH/ MOVEMENT	PROPOSED STORAGE (ft)	ADEQUATE LENGTH?	95 th PERCENTILE QUEUE LENGTH (ft)	
				AM PEAK HOUR	PM PEAK HOUR
East Emory Road (EB & WB) at Beeler Road (NB)	Eastbound Right	75	Yes	5	20
	Westbound Left/Thru	n/a	n/a	105	216
	Northbound Left	n/a	n/a	72	145
	Northbound Right	100	Yes	79	99

Note: 95th percentile queues were calculated in SimTraffic 11 software

- 3d) This report has determined that the documented need for separate left and right-turn lanes on East Emory Road at Beeler Road will be satisfied by the capacity provided by the future TDOT widening project in 2030. TDOT proposes widening East Emory Road from 2 to 5 lanes. This project will include two thru lanes in each direction and a center turn lane. East Emory Road will be widened to provide a center turn lane for westbound left-turns at Beeler Road, and the two thru lanes (in each direction) will eliminate the need for a separate eastbound right-turn lane at Beeler Road.


The thru volumes on East Emory Road shown in Figure 8 were increased by an annual growth factor of 1% from 2027 to 2030 to provide an analysis of the intersection in 2030 with the TDOT road widening project. These volumes are shown in Figure 9.

The eastbound right-turn volume thresholds were examined in the projected 2030 conditions to provide evidence that the need for a separate eastbound right-turn lane will be eliminated with a 5-lane roadway section. This examination included the AM and PM peak hour projected 2030 volumes on East Emory Road with five lanes, as shown in Figure 9. The worksheets from this examination are shown in Appendix I and show that a separate eastbound right-turn lane at the intersection would not be required with a 5-lane roadway section on East Emory Road with the projected 2030 traffic volumes.

The capacity and vehicle queues calculations were re-analyzed with five lanes on East Emory Road and the recommended northbound right-turn lane on Beeler Road, combined with the projected 2030 traffic volumes. The results of these calculations are

shown in Tables 12 and 13. The worksheets for these results are provided in Appendix F and J.

TABLE 12
2030 INTERSECTION CAPACITY ANALYSIS RESULTS -
PROJECTED TRAFFIC CONDITIONS (WITH THE PROJECT)
WITH TDOT WIDENING PROJECT AND NORTHBOUND RIGHT-TURN LANE ON BEELER ROAD

INTERSECTION	TRAFFIC CONTROL	APPROACH/ MOVEMENT	AM PEAK			PM PEAK		
			LOS	DELAY (seconds)	V/C	LOS	DELAY (seconds)	V/C
East Emory Road (EB & WB) at Beeler Road (NB)		Northbound Left	C	22.7	0.283	E	48.1	0.537
		Northbound Right	B	12.6	0.304	B	14.7	0.268
		Westbound Left	A	8.9	0.075	B	11.4	0.222

Note: All analyses were calculated in Synchro 11 software and reported using HCM 2010 intersection methodology

^a Level of Service

^b Average Delay (sec/vehicle)

^c Volume-to-Capacity Ratio

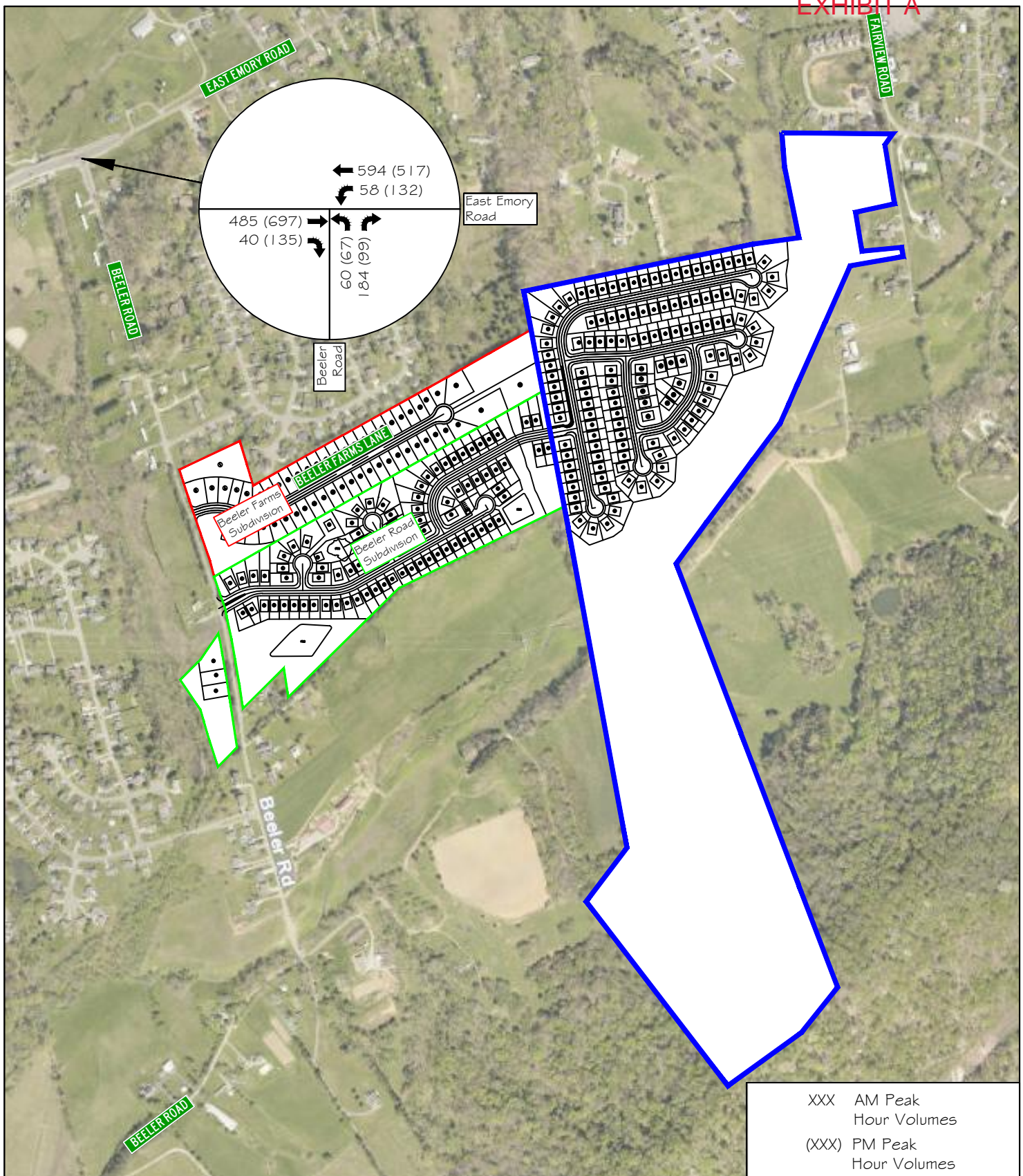
As shown in Table 12, the TDOT road widening project in 2030, coupled with the recommended northbound right-turn lane on Beeler Road, will provide the necessary road capacity to mitigate the excessive vehicle delays on the northbound approach at the intersection of East Emory Road at Beeler Road.

As shown in Table 13, the recommended northbound right-turn lane with 100 feet of storage will be adequate in the projected 2030 conditions since the longest 95th percentile vehicle queue is calculated to be 76 feet in the projected PM peak hour.

TABLE 13
TURN LANE STORAGE & VEHICLE QUEUE SUMMARY -
2030 PROJECTED TRAFFIC CONDITIONS (WITH THE PROJECT)
WITH TDOT WIDENING PROJECT AND NORTHBOUND RIGHT-TURN LANE ON BEELER ROAD

INTERSECTION	APPROACH/ MOVEMENT	PROPOSED STORAGE (ft)	ADEQUATE LENGTH?	95 th PERCENTILE QUEUE LENGTH (ft)	
				AM PEAK HOUR	PM PEAK HOUR
East Emory Road (EB & WB) at Beeler Road (NB)	Eastbound Thru/Right	n/a	n/a	5	17
	Westbound Left	n/a	n/a	45	71
	Northbound Left	n/a	n/a	66	100
	Northbound Right	100	Yes	66	76

Note: 95th percentile queues were calculated in SimTraffic 11 software



11812 Black Road
Knoxville, TN 37932
Phone: (865) 556-0042
Email: ajaxengineering@gmail.com

NOT TO SCALE



FIGURE 9

Fairview Road Subdivision

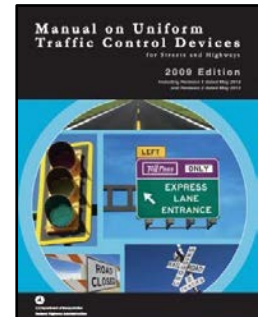
2030 Peak Hour Traffic Volumes -
PROJECTED CONDITIONS
(WITH THE PROJECT)

- 3e) As a further investigation into potential remediation for this intersection in future conditions, an evaluation was conducted with respect to traffic signal warrants.

Methodology:

The Manual on Uniform Traffic Control Devices – 2009 Edition

(MUTCD) presents nine different warrants that the traffic engineering profession has developed 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 include 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 must be applied before justifying the need for a traffic signal installation. These additional studies are significant in ensuring that a traffic signal's installation will not degrade safety and efficiency.

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 applications 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). 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 East Emory Road at Beeler Road was evaluated in the projected 2030 conditions with the volumes shown in Figure 9 to determine whether a traffic signal could be justified based on the MUTCD Warrants listed above. Beeler Road was used as the minor side street for the warrant analysis, and East Emory Road was the major street. Warrant #7 was not analyzed at this intersection 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...”; therefore, this warrant was not included in this study.

A spreadsheet was developed and used to calculate the 2030 traffic volumes generated by the developments being added to the intersection during the highest 8 hours of traffic based on the study’s assumed trip distribution and assignment. The volumes in the spreadsheet include the existing tabulated thru volumes on East Emory Road increased by 1% for eight years to the year 2030, and the generated traffic from the houses in Beeler Farms Subdivision, Beeler Road Subdivision, and the Fairview Road Subdivision. This spreadsheet is shown in Appendix K.

Traffic signal warrants for this intersection were analyzed with the additional lanes that will be provided on East Emory Road by the TDOT widening project. Based on the projected 2030 traffic volumes with the 5-lane section on East Emory Road, the results of this evaluation determined that Warrant #1 would not be fully met but would meet Warrant #2. Appendix K includes the traffic signal warrant spreadsheet for the projected traffic volumes in 2030, with East Emory Road having 5-lanes provided by the TDOT widening project.




In conclusion, since TDOT does not allow for a traffic signal to be constructed on speculative or projected volumes, it is recommended that traffic counts be re-conducted in the future once the subdivisions on Beeler Road are constructed and fully occupied,

and the road widening of East Emory Road is under design. Updated traffic counts will allow a re-examination of the Traffic Signal Warrants and establish a timeframe if this intersection could or should be signalized during the TDOT road widening project of East Emory Road. Traffic crash data should also be included in the examination.

Higher growth than anticipated in this study could occur and increase traffic volumes large enough to meet Warrant #1 fully.

In summary, and to provide a comparison of all the discussed options, Table 14 presents the calculated LOS and 95th percentile vehicle queues at the intersection of East Emory Road at Beeler Road for three scenarios. The scenarios in the table include the 2027 projected conditions with the project, the 2027 projected conditions with the project and an eastbound and northbound right-turn lane, and the 2030 projected conditions with the project with a northbound right-turn lane and the TDOT road widening with five lanes. As seen in the table, the vehicle delays and queues are reduced in each scenario when additional road capacity is provided.

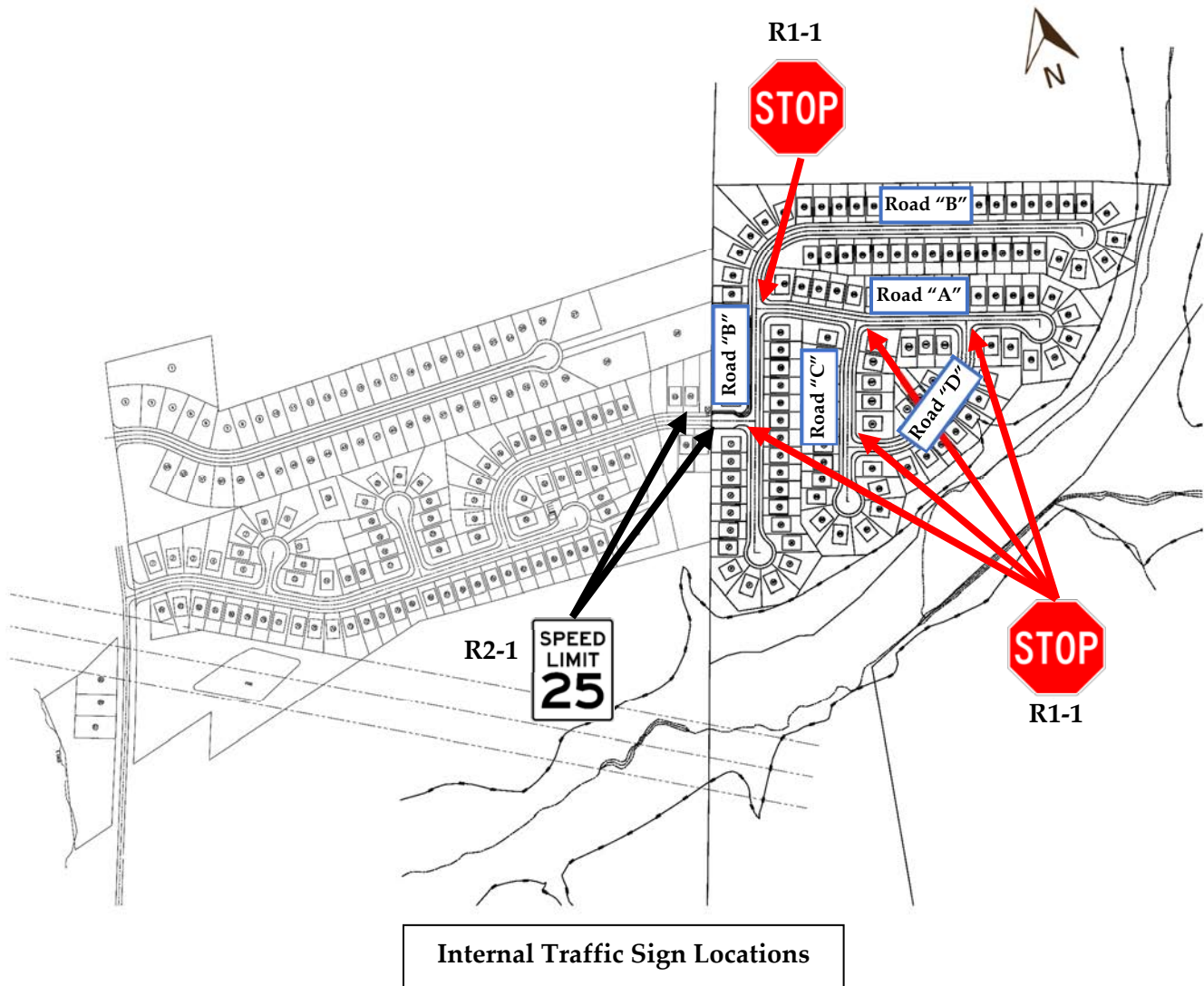
TABLE 14
INTERSECTION CAPACITY AND VEHICLE QUEUE ANALYSIS RESULTS -
EAST EMORY ROAD AT BEELER ROAD

INTERSECTION	TRAFFIC CONTROL	APPROACH/ MOVEMENT	AM PEAK			PM PEAK		
			LOS	DELAY (seconds)	QUEUE LENGTH (ft)	LOS	DELAY (seconds)	QUEUE LENGTH (ft)
2027 Projected Conditions (With the Project)	 Unsignalized	Northbound Left/Right	F	172.0	156	F	820.2	298
		Westbound Left/Thru	A	8.9	114	B	11.2	242
2027 Projected Conditions (With the Project) with EB and NB Right- Turn Lanes	 Unsignalized	Northbound Left	F	108.8	72	F	611.8	145
		Northbound Right	C	16.0	79	C	19.5	99
		Westbound Left/Thru	A	8.9	105	B	11.2	216
2030 Projected Conditions (With the Project) with 5-Lane TDOT Widening and NB Right-Turn Lane	 Unsignalized	Northbound Left	C	22.7	66	E	48.1	100
		Northbound Right	B	12.6	66	B	14.7	76
		Westbound Left	A	8.9	45	B	11.4	71



Fairview Road Subdivision Internal Roads: The layout plan shows one entrance via Beeler Road Subdivision, as shown in Figure 3 and below.

- 4a) Two 25-mph Speed Limit (R2-1) signs are recommended to be installed on the connector road between Beeler Road and Fairview Road Subdivisions. One sign should be installed for eastbound travel into Fairview Road Subdivision and one for westbound travel into the Beeler Road Subdivision. This recommendation will provide a reinforcement notification of the speed limit within the subdivisions.
- 4b) Stop Signs (R1-1) with 24" white stop bars and other traffic signage are recommended to be installed at the internal locations in Fairview Road Subdivision, as shown below:



- 4c) Sight distance at the new internal subdivision road intersections must not be impacted by signage, parked cars, or future landscaping. With a proposed speed limit of 25-mph in the development, the internal intersection sight distance is 250 feet. The required stopping sight distance is 155 feet for a level road grade. The site designer should ensure that internal sight distance lengths are met and account for different proposed road grades.
- 4d) The internal roads of “A” and “B” in the Fairview Road Subdivision have relatively long and straight road segments. Straight road segments encourage motorists to travel at higher speeds, especially with steep grades. It is recommended that the site designer consider traffic calming measures on these internal roads. Roads “C” and “D” are relatively short and would not necessarily require traffic calming measures.

Speed humps are a prevalent traffic calming measure to install in residential areas to reduce vehicle speeds due to their relatively low cost. However, speed humps are not recommended on roads with grades greater than 8%.

If implemented, it is recommended that the site designer consider speed humps and chokers. Chokers are recommended when the internal road grades are greater than 8%. A choker is used to discourage motorists from speeding and is appropriate in residential settings. A choker is created by narrowing the road using curb extensions or can be created by installing a planting strip on an island at the road edge. Any road design with chokers must consider driveway placement, stormwater, and sight distance. Details of any traffic calming should be coordinated with Knox County Engineering in the detailed design phase.

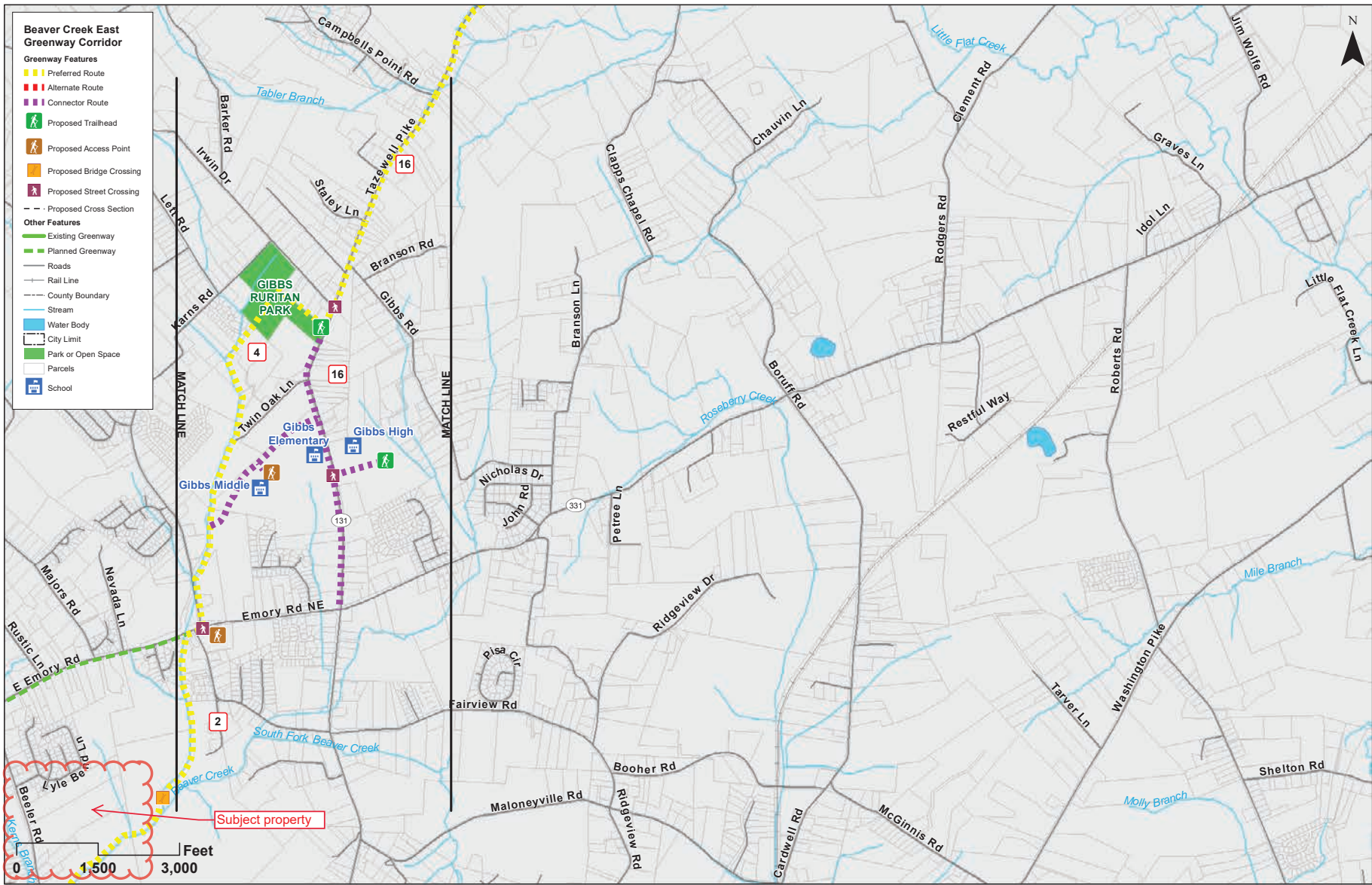
- 4e) All drainage grates and covers for the residential development must be pedestrian and bicycle safe.
- 4f) Any sidewalk proposed in the subdivision should be 5 feet minimum in width to meet Knox County regulations. The provision of internal sidewalks in the Beeler Road Subdivision has been removed. The provision of sidewalks in Fairview Road Subdivisions is not known.
- 4g) Knox County completed a greenway study in 2020. They recommended Beaver Creek as a preferred route for a new greenway connecting the area around Interstate 75 in

Powell to the Knox County/Union County line. With Beaver Creek adjacent to the development site and on the development property to the south of the proposed houses, the developer should discuss with Knox County if this potential greenway path is feasible to implement while the property is being developed.

- 4h) For residential subdivisions with a single access point and more than 150 houses, Knox County has a long-standing unwritten design policy requiring a second entrance or a boulevard road typical section at the entrance. According to the County, the intent of a boulevard road typical section is to provide a substantial alternate travel path by constructing one up to an internal intersection. This requirement and the appropriate mitigation are evaluated on a case-by-case basis and may require further discussions at future stages of the design plan process. There is a potential for an additional access point to the north in Fairview Road Subdivision that would provide two travel paths. The final decision on the most appropriate way to address this policy will be decided by Knox County Engineering and Public Works.
- 4i) All road grade and intersection elements should be designed to AASHTO, TDOT, and Knox County specifications and guidelines to ensure proper operation.

Figure 4-3. Beaver Creek East: East of Beeler Road to Campbells Point Road

Knox County Greenway Corridor Study (adopted January 2020)





Development Request

DEVELOPMENT

- ☒ Development Plan
☐ Planned Development
☐ Use on Review / Special Use
☐ Hillside Protection COA

SUBDIVISION

- ☒ Concept Plan
☐ Final Plat

ZONING

- ☐ Plan Amendment
☐ Sector Plan
☐ One Year Plan
☐ Rezoning

Mesana Investments - Beeler Road

Applicant Name

Affiliation

11/29/2022

1/12/2023

1-SF-23-C / 1-E-23-DP

Date Filed

Meeting Date (if applicable)

File Number(s)

CORRESPONDENCE

All correspondence related to this application should be directed to the approved contact listed below.

David Harbin Batson, Himes, Norvell and Poe

Name / Company

4334 Papermill Dr. Dr. Knoxville TN 37909

Address

865-588-6472 / harbin@bhn-p.com

Phone / Email

CURRENT PROPERTY INFO

Mesana Investments, LLC

P.O. Box 11315 Knoxville TN 37939

865-693-3356 / swd444@gmail.

Owner Name (if different)

Owner Address

Owner Phone / Email

0 BEELER RD

Property Address

29 188.03

27.539 acres

Parcel ID

Part of Parcel (Y/N)?

Tract Size

Northeast Knox Utility District

Northeast Knox Utility District

Sewer Provider

Water Provider

Septic (Y/N)

STAFF USE ONLY

East and west side of Beeler Rd, south of Beeler Farms Ln

General Location

☐ City

Commission District 8

PR (Planned Residential)

Agriculture/Forestry/Vacant Land

☒ County District

Zoning District

Existing Land Use

Northeast County

LDR (Low Density Residential), HP (Hillside Protection), S

Planned Growth Area

Planning Sector

Sector Plan Land Use Classification

Growth Policy Plan Designation

DEVELOPMENT REQUEST

<input checked="" type="checkbox"/> Development Plan	<input type="checkbox"/> Planned Development	<input type="checkbox"/> Use on Review / Special Use	Related City Permit Number(s)
<input type="checkbox"/> Hillside Protection COA	<input type="checkbox"/> Residential	<input type="checkbox"/> Non-residential	
Home Occupation (specify) _____			
Other (specify) Detached residential subdivision			

SUBDIVISION REQUEST

Mesana Investments - Beeler Road	Related Rezoning File Number
Proposed Subdivision Name	
Unit / Phase Number	87 Total Number of Lots Created
Additional Information _____	
<input type="checkbox"/> Attachments / Additional Requirements	

ZONING REQUEST

<input type="checkbox"/> Zoning Change	Pending Plat File Number
Proposed Zoning	
<input type="checkbox"/> Plan Amendment	Proposed Plan Designation(s)
Proposed Density (units/acre) Previous Zoning Requests	
Additional Information _____	

STAFF USE ONLY

PLAT TYPE

☐ Staff Review ☐ Planning Commission

ATTACHMENTS

☐ Property Owners / Option Holders ☐ Variance Request

ADDITIONAL REQUIREMENTS

☐ COA Checklist (Hillside Protection)
☐ Design Plan Certification (Final Plat)
☒ Site Plan (Development Request)
☐ Traffic Impact Study
☐ Use on Review / Special Use (Concept Plan)

Fee 1	Total
\$500.00	
Fee 2	
Fee 3	

AUTHORIZATION

Mesana Investments - Beeler Road		11/29/2022
Applicant Signature	Please Print	Date
Phone / Email		
Mesana Investments, LLC		11/29/2022
Property Owner Signature	Please Print	Date

I declare under penalty of perjury the foregoing (i.e., he/she/they is/are the owner of the property and that the application and all associated materials are being submitted with his/her/their consent) is true and correct.



Development Request

DEVELOPMENT

- ☒ Development Plan
☐ Planned Development
☐ Use on Review / Special Use
☐ Hillside Protection COA

SUBDIVISION

- ☒ Concept Plan
☐ Final Plat

ZONING

- ☐ Plan Amendment
☐ SP ☐ OYP
☐ Rezoning

MESANA INVESTMENTS - BEELER ROAD

Applicant Name

Affiliation

11.28.22

Date Filed

1/12/2023

Meeting Date (if applicable)

File Number(s)

CORRESPONDENCE

All correspondence related to this application should be directed to the approved contact listed below.

- ☐ Applicant ☐ Property Owner ☐ Option Holder ☒ Project Surveyor ☒ Engineer ☐ Architect/Landscape Architect

DAVID HARBIN

Name

BATSON Himes MORVELL POE

Company

4334 PAPERMILL DR

Address

KNOXVILLE

City

TN

State

37909

ZIP

865-588-6472

Phone

harbin@bhn-p.com

Email

CURRENT PROPERTY INFO

MESANA INVESTMENTS Knoxville, TN

SCOTT DAVIS

Property Owner Name (if different)

P.O. BOX 11315 37922

Property Owner Address

865-866-8008

Property Owner Phone

0 Beeler Road

Property Address

TAX MAP 29, Parcel 188.03

Parcel ID

HPUD

Sewer Provider

UKUD

Water Provider

no

Septic (Y/N)

STAFF USE ONLY

East and west side of Beeler Road, south of Beeler Farms Ln

General Location

27.539 acres

Tract Size

☐ City ☒ County
District

PR (Planned Residential)
Zoning District

Agriculture/forestry/vacant
Existing Land Use

Northeast County
Planning Sector

LDR, HP & SP
Sector Plan Land Use Classification

Planned Growth
Growth Policy Plan Designation

August 29, 2022

DEVELOPMENT REQUEST

- ☒ Development Plan ☐ Use on Review / Special Use ☐ Hillside Protection COA
☒ Residential ☐ Non-Residential

Home Occupation (specify) _____

Other (specify) Detached residential subdivision

Related City Permit Number(s)

SUBDIVISION REQUEST

Mesana Investments - Beeler Road

Proposed Subdivision Name

Related Rezoning File Number

5-L-22-RZ

Unit / Phase Number ☐ Combine Parcels ☒ Divide Parcel 87 lots
Total Number of Lots Created☐ Other (specify) Detached residential subdivision☐ Attachments / Additional Requirements**ZONING REQUEST**☐ Zoning Change Proposed Zoning

Pending Plat File Number

☐ Plan Amendment Change Proposed Plan Designation(s)

Proposed Density (units/acre)

Previous Rezoning Requests

☐ Other (specify) _____**STAFF USE ONLY****PLAT TYPE**

- ☐ Staff Review ☐ Planning Commission

ATTACHMENTS

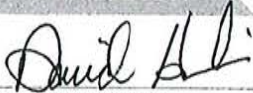
- ☐ Property Owners / Option Holders ☐ Variance Request

ADDITIONAL REQUIREMENTS

- ☐ Design Plan Certification (*Final Plat*)
☐ Use on Review / Special Use (*Concept Plan*)
☐ Traffic Impact Study
☐ COA Checklist (*Hillside Protection*)

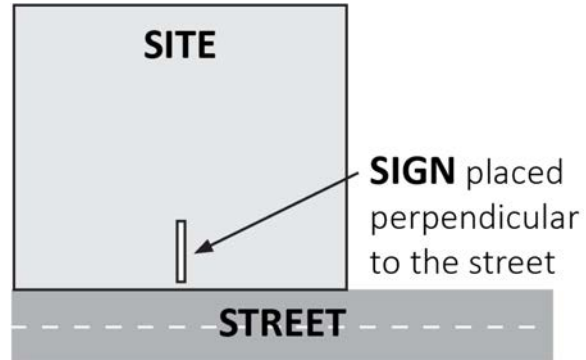
Fee 1		Total \$500
0101	Concept Plan	
Fee 2		
Fee 3		

MR

AUTHORIZATION
Applicant SignatureDAVID HARBIN
Please Print11-28-22
Date865-588-6472
Phone Numberharbin@bhn-p.com
Email
Property Owner SignatureScott Davis
Please Print11/28/22
Date

I declare under penalty of perjury the foregoing [i.e., he/she/they is/are the owner of the property and that the application and all associated materials are being submitted with his/her/their consent] is true and correct.

The Administrative Rules and Procedures of the Knoxville-Knox County Planning Commission require a sign to be posted on the property for each application subject to consideration by the Planning Commission, including the following applications: rezoning, plan amendment, concept plan, use on review/special use, planned development, right-of-way closure, and name change.



The required public notice sign(s) will be provided by Planning to the applicant when an application is submitted. If an application is submitted electronically, Planning staff will post the required sign. If a replacement sign(s) is needed, the applicant is responsible for picking up the new sign(s) from Planning and will be charged \$10 for each replacement.

LOCATION AND VISIBILITY

The sign must be posted on the nearest adjacent/frontage street and in a location clearly visible to vehicles traveling in either direction. If the property has more than one street frontage, the sign should be placed along the street that carries more traffic. Planning staff may recommend a preferred location for the sign to be posted at the time of application.

TIMING

The sign(s) must be posted **not less than 12 days prior to the scheduled Planning Commission public hearing** and must remain in place until the day after the meeting. In the case of a postponement, the sign can either remain in place or be removed and reposted not less than 12 days prior to the next Planning Commission meeting. The applicant is responsible for removing the sign after the application has been acted upon by the Planning Commission.

The individual below is responsible for posting and removing the sign(s) provided consistent with the above guidelines and between the dates of:

_____ and _____
 12/31/2022 1/13/2023
 (applicant or staff to post sign) (applicant to remove sign)

Applicant Name: Mesana Investments - Beeler Rd

Date: 11/29/22

File Number: 1-SF-23-C 1-E-23-DP

☒

Sign posted by Staff

☐

Sign posted by Applicant