

SUBDIVISION REPORT - CONCEPT/USE ON REVIEW

► FILE #: 1-SA-22-C AGENDA ITEM #: 15

1-D-22-UR AGENDA DATE: 3/10/2022

POSTPONEMENT(S): 1/13/2022, 2/10/2022

► SUBDIVISION: BROWN PROPERTY- COUCH MILL ROAD

► APPLICANT/DEVELOPER: SAFE HARBOR DEVELOPMENT, LLC

OWNER(S): Hardin Valley Farm, LLC

TAX IDENTIFICATION: 117 8 (PART OF) View map on KGIS

JURISDICTION: County Commission District 6

STREET ADDRESS: 11636 Hardin Valley Rd.

► LOCATION: South side of Couch Mill Road, west of Caspian Drive

SECTOR PLAN: Northwest County

GROWTH POLICY PLAN: Rural Area
WATERSHED: Conner Creek

APPROXIMATE ACREAGE: 131.2 acres

ZONING: PR (Planned Residential)

► EXISTING LAND USE: Vacant land

▶ PROPOSED USE: Detached & attached residential subdivision

SURROUNDING LAND

North: Agriculture/forestry/vacant, single family residential, rural residential -
USE AND ZONING:

A (Agricultural)

South: Agriculture/forestry/vacant -- A (Agricultural)

East: Agriculture/forestry/vacant, single family residential, rural residential --

A (Agricultural)

West: Agriculture/forestry/vacant -- A (Agricultural)

► NUMBER OF LOTS: 359

SURVEYOR/ENGINEER: David Harbin / Batson, Himes, Norvell & Poe

ACCESSIBILITY: Access is via Couch Mill Rd, a major collector street with 18ft of pavement

width within 50-60ft of right-of-way.

► SUBDIVISION VARIANCES

REQUIRED:

VARIANCES

1) Reduce the minimum tangent length between broken back curves

from 150 ft to 123 ft on Road 'C' from STA 5+97 to 7+20

ALTERNATIVE DESIGN STANDARDS REQUIRING KNOXVILLE-KNOX

COUNTY PLANNING COMMISSION APPROVAL

1) Reduce the minimum horizontal curve radius from 250 ft to 125 ft on

Road' B' at STA 21+50

ALTERNATIVE DESIGN STANDARDS REQUIRING KNOX COUNTY

ENGINEERING AND PUBLIC WORKS APPROVAL

1) Increase the intersection grade from 1 percent to up to 3 percent for the intersections listed in Note #13 on the Concept Plan.

STAFF RECOMMENDATION:

▶ Approve the variance and alternative design standard based on the justifications provided by the applicant and the recommendations of the Knox County Department of Engineering and Public Works, and because the site conditions restrict compliance with the Subdivision Regulations and will not create a traffic hazard.

Approve the Concept Plan subject to 16 conditions.

- 1. Connection to sanitary sewer and meeting any other relevant requirements of the utility provider.
- 2. Provision of street names consistent with the Uniform Street Naming and Addressing System within Knox County (County Ord. 91-1-102).
- 3. All sidewalks and crosswalks within the public right-of-way shall meet the applicable ADA standards. The design details shall be worked out with Knox County Engineering and Public Works during the design plan phase.
- 4. Implementation of the street and intersection improvements and recommendations outlined in the Couch Mill Road Subdivision Transportation Impact Study prepared by AJAX Engineering (Revised 2/18/2022), as revised and approved by the Knox County Department of Engineering and Public Works and Planning staff (see Exhibit A). 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 during the design plan stage for the subdivision.

 5. Providing a minimum 200-ft sight distance easement across Lot 162 on the final plat. The driveway on this
- 5. Providing a minimum 200-ft sight distance easement across Lot 162 on the final plat. The driveway on this lot must have a depth of 20-ft beyond the sight distance easement.
- 6. Providing the 25-ft common area along the Couch Mill Road frontage where the adjacent lots do not meet the double frontage lot depth standard per Section 3.02.A.4. of the Subdivision Regulations.
- 7. Providing the proposed road stub-outs per Section 3.04.C.2.b. of the Subdivision Regulations.
- 8. Providing notification of future street connections at the terminus of the stub-out per Section 3.04.C.2.d. of the Subdivision Regulations.
- 9. Providing the location of all sinkholes/closed contours and the 50-ft buffer (building setback) on the final plat per Section 3.06.B of the Subdivision Regulations.
- 10. Providing a note on the final plat that all structures are to be located outside of the 50-ft buffer (building setback) for sinkholes/closed contours unless a geotechnical study prepared by a registered engineer states that building within the 50-ft sinkhole/closed contour buffer (building setback) is acceptable and the study is approved by the Knox County Department of Engineering and Public Works. The geotechnical study must be reviewed and approved by Knox County Department of Engineering and Public Works prior to approval of a plat for any proposed lots that do not have adequate building area outside of the 50-ft buffer (building setback) area. Building construction is not permitted within the sinkhole/closed contour area or any required drainage easement for the sinkhole/closed contour area.
- 11. Meeting all applicable requirements of the Knox County Zoning Ordinance.
- 12. Meeting all applicable requirements of the Knox County Department of Engineering and Public Works.
- 13. Providing a note on the final plat that all lots will have access to internal streets.
- 14. Submitting to Planning staff prior to final plat review by the Planning Commission or Planning staff, the certification of design plan approval form as required by the Knoxville-Knox County Subdivision Regulations.
- 15. 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, amenities, and drainage system.
- 16. [ADDED 3/8/2022] Per discussion at County Commission, offsite improvements (including sidewalk and intersection improvements at Sam Lee/Steele/Swafford) shall be completed in partnership with Knox County Engineering and Public Works. Before issuing a plat, an agreement codifying the timeline and cost-sharing shall be executed.
- ▶ Approve the development plan for 359 detached residential houses on individual lots and the peripheral setback reduction from 35 ft to 25 ft for all double frontage lots with an adjacent 25-ft common area strip along the Couch Mill Road frontage, subject to 2 conditions.
 - 1. Meeting all applicable requirements of the Knox County Zoning Ordinance.
 - 2. Providing a minimum 20-ft wide common area strip along the northeast boundary of the development, to the rear of Lots 3 16, as proposed.

With the conditions noted, this plan meets the requirements for approval of a Concept Plan and Use on Review in a PR zoning district.

COMMENTS:

Condition #16 was added 3/8/2022.

This proposal is for a 359-lot detached residential subdivision on 131.2 acres, at a density of 2.74 du/ac. There are two access points to Couch Mill Road and three stub-out roads to the large undeveloped properties to the south. There are several large sinkholes on the site, many of which are proposed as open space amenities with walking trails. The property was rezoned from A (Agricultural) to PR (Planned Residential) up to 3 du/ac on January 24, 2022 (12-I-21-RZ).

AMENITIES

The 33.54 acres of common areas are primarily located around sinkholes and provide buffers to adjacent houses. Several walking trails in the common areas make internal pedestrian connections throughout the neighborhood. A community pool, bathhouse, and playground are proposed near the western entrance to the site with access to Road 'G'.

TRANSPORTATION IMPACT STUDY (TIS)

The conclusions and recommendations of the Coach Mill Road TIS (AJAX Engineering, 2/18/2022) are presented in Exhibit A. The primary recommendation is to widen Coach Mill Road to 21' from the western entrance (Road 'G') to the Steele Road intersection. The study concluded that the Sam Lee Road/Swafford Road/Steele Road 4-way intersection does not warrant conversion from a 2-way stop control to 4-way stop control. The study further recommends that Knox County consider converting this intersection to a roundabout because of the large, undeveloped tracts remaining in this area (see condition #16). The TIS makes additional recommendations regarding the design of the new internal streets.

CONNECTIVITY

This proposal has two access points to Couch Mill Road and three stub-out roads to properties that border to the south. Two of the proposed stub-outs are located on the east half of the development and connect to the remaining portion of the subject property. The third stub-out is located in the southwest corner of the property. Multiple stub-outs are desired for this property because it is the most feasible opportunity for a north-south connection between Hardin Valley Road and Couch Mill Road/Sam Lee Road, west of Steele Road. This is approximately the same location as the proposed north-south connector proposed in the Hardin Valley Mobility Plan (2019) (see Exhibit B).

SIDEWALKS

The applicant is proposing sidewalks on one side of all roads within the subdivision and sidewalk along the Couch Mill Road/Sam Lee Road from the western access point (Road 'G') to the Sam Lee Road/Swafford Road/Steele Road intersection. The Knox County sidewalk ordinance requires sidewalks along the Couch Mill Road frontage and on internal roads that is projected to have over 1000 daily vehicle trips. At the request of Knox County Engineering and Public Works, some of the sidewalk required along the western portion of the Couch Mill Road frontage will be constructed on Sam Lee Road to the east, to make a sidewalk connection to Steele Road. The final details of the sidewalks will be determined during the design plan phase.

HILLSIDE PROTECTION AREA

There is 37.48 acres of this site within the Hillside Protection (HP) area, most of which is located around the large sinkholes in the northwest portion of the property. Besides the slope associated with the sinkholes, the property consists mainly of rolling hills. The slope analysis for this site recommends disturbing a maximum of 23 acres in the HP area. This proposal disturbs approximately 20.9 acres of the HP area and complies with the Hillside and Ridgetop Protection Plan recommendations.

SINKHOLES

There are several large sinkholes on this property which are identified with grey shading on plan sheet C3 (Sinkhole Site Plan). The dashed line around the sinkholes represents the 50 ft buffer around the uppermost closed contour of the feature required by the Subdivision Regulations (Section 3.06.B.). Each lot must have a buildable area outside of the closed contour of a sinkhole. Still, a house can be built within the 50 ft buffer if a geotechnical study prepared by a registered engineer states that building within the 50 ft sinkhole area is acceptable. The houses must also have engineered foundations. During the design plan phase, the uppermost closed contour of the sinkholes will be further defined and could result in the sinkholes being larger than depicted on this Concept Plan and could result in the loss of lots.

VARIANCES AND ALTERNATIVE DESIGN STANDARDS

The applicant's engineer listed the requested deviations from the Subdivision Regulations on the Variances/Alternative Design Standards Request form (attached), as well as the stated hardships for the requests. The Knox County Engineering and Public Works department agrees with the requested variance and alternative design standard. The alternative design standard requested for the various intersection grades will be reviewed in more detail during the design plan phase to ensure ADA standards are met where there are crosswalks.

DEVELOPMENT STANDARDS FOR USES PERMITTED ON REVIEW (ARTICLE 4.10 - SECTION 2)

The planning commission, in the exercise of its administrative judgment, shall be guided by adopted plans and policies, including the general plan and the following general standards:

- 1) THE PROPOSED USE IS CONSISTENT WITH THE ADOPTED PLANS AND POLICIES, INCLUDING THE GENERAL PLAN AND SECTOR PLAN.
- A. The Northwest County Sector Plan designates this property for rural residential uses with a maximum density 3 du/ac. The proposed development with a density of 2.74 du/ac is consistent with the Sector Plan.
- B. There are 37 acres of this 131-acre property located in the Hillside Protection (HP) area. The maximum land disturbance recommended within the HP area is 23 acres (see the attached slope analysis). This proposal will disturb 20.9 acres within the HP area and is consistent with the HP land disturbance guidelines.
- C. The Hardin Valley Mobility Plan (2019) recommends a north-south connector from Couch Mill Road to Hardin Valley Road (and the proposed east-west connector between Steele Road and Mission Hill Lane). The proposed stub-out roads will provide multiple opportunities to realize the north-south connector. This proposed east-west connector is south of the subject property. See Exhibit B.
- 2) THE USE IS IN HARMONY WITH THE GENERAL PURPOSE AND INTENT OF THE ZONING ORDINANCE.
- A. The PR (Planned Residential) zone is intended to provide optional methods of land development whichencourage more imaginative solutions to environmental design problems. Residential areas thus established would be characterized by a unified building and site development program, open space for recreation and provision for commercial, religious, educational, and cultural facilities which are integrated with the total project by unified architectural and open space treatment. Each planned unit development shall be compatible with the surrounding or adjacent zones. Such compatibility shall be determined by the planning commission by review of the development plans.
- B. The proposed subdivision will have detached residential lot sizes comparable to those in existing and recently approved subdivisions in the area.
- C. The applicant is proposing a 20-ft wide common area strip along the northeast property boundary to provide a buffer to the adjacent residential subdivision.
- D. The residential lots are being clustered to buildable areas outside of the closed contour of the sinkholes.
- E. The property is zoned PR up to 3 du/ac, and the proposed subdivision has a density of 2.74 du/ac.
- 3) THE USE IS COMPATIBLE WITH THE CHARACTER OF THE NEIGHBORHOOD WHERE IT IS PROPOSED, AND WITH THE SIZE AND LOCATION OF BUILDINGS IN THE VICINITY.
- A. The proposed subdivision will have detached residential lot sizes and setbacks that are similar to others in the area.
- B. The 25-ft common area strip along the Couch Mill Road frontage will create separation between the roadway and the house lots.
- C. The applicant is proposing a 20-ft common area strip on the northeast boundary as a buffer to the adjacent residential subdivision.
- 4) THE USE WILL NOT SIGNIFICANTLY INJURE THE VALUE OF ADJACENT PROPERTY.
- A. The use of the property for single-family residential should not significantly injure the value of the adjacent properties.
- 5) THE USE WILL NOT DRAW ADDITIONAL TRAFFIC THROUGH RESIDENTIAL AREAS.
- A. The development has direct access to Couch Mill Road, a major collector street.
- 6) THE NATURE OF DEVELOPMENT IN THE SURROUNDING AREA IS NOT SUCH AS TO POSE A POTENTIAL HAZARD TO THE PROPOSED USE OR TO CREATE AN UNDESIRABLE ENVIRONMENT FOR THE PROPOSED USE.
- A. There are no known uses in the area that could be a potential hazard or create an undesirable environment for the proposed residential use.

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.

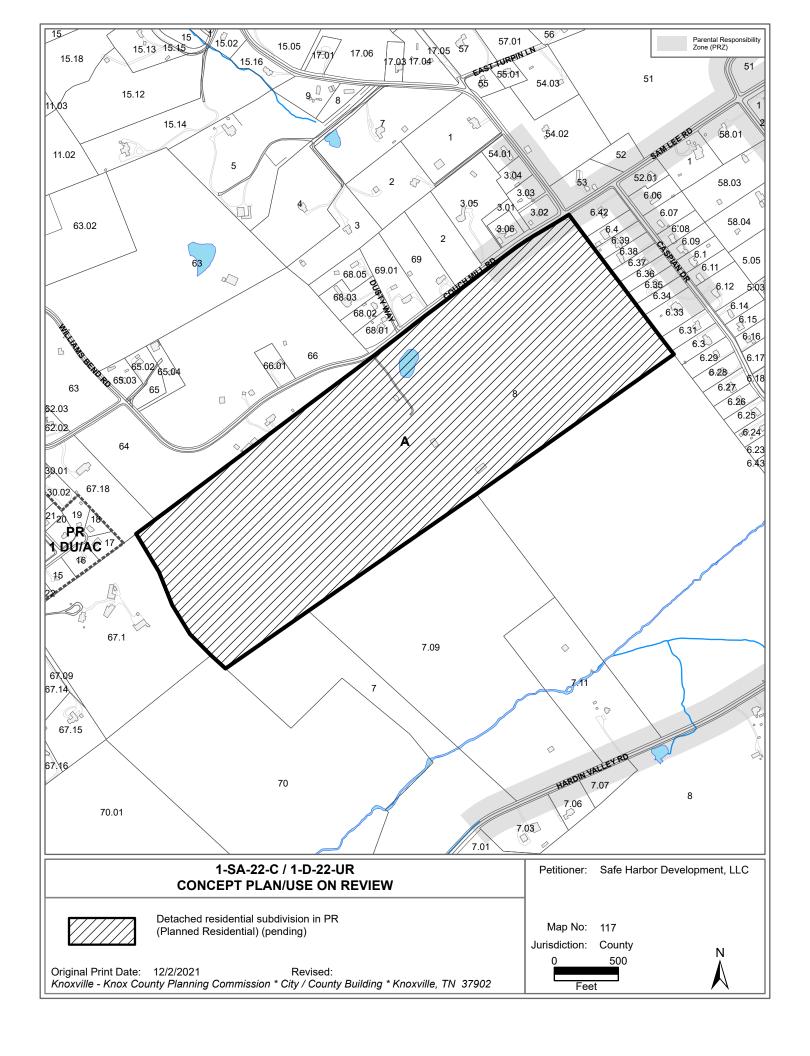
ESTIMATED STUDENT YIELD: 155 (public school children, grades K-12)

Schools affected by this proposal: Hardin Valley Elementary, Hardin Valley Middle, and Hardin Valley Academy.

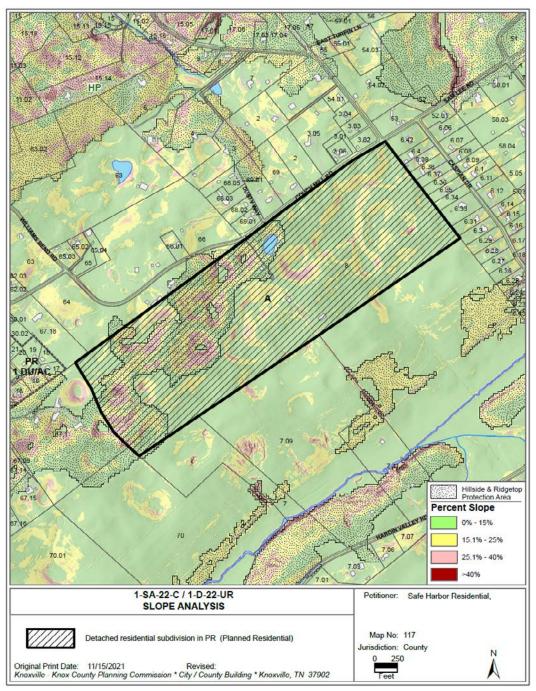
- Potential new school population is estimated using locally-derived data on public school student yield generated by new housing.
- Students are assigned to schools based on current attendance zones as determined by Knox County Schools. Students may request transfers to different zones, and zone boundaries 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.

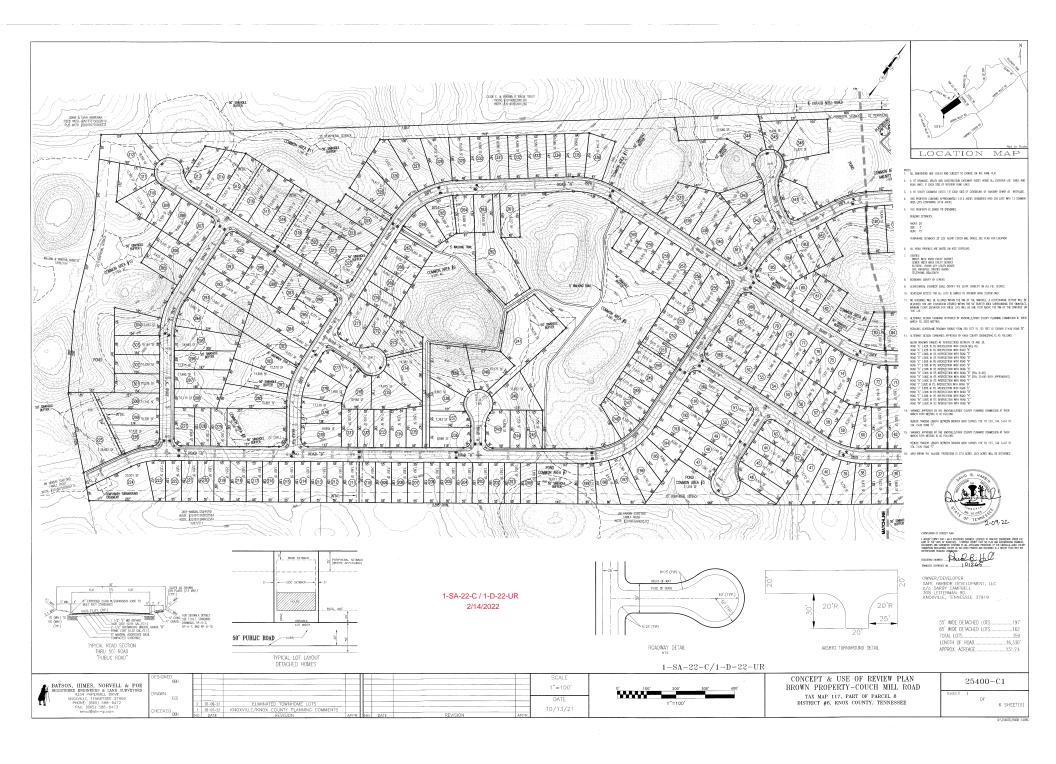
Knoxville-Knox County Planning Commission's approval or denial of this concept plan request is final, unless the action is appealed to Knox County Chancery Court. The date of the Knox County Chancery Court hearing will depend on when the appeal application is filed.

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

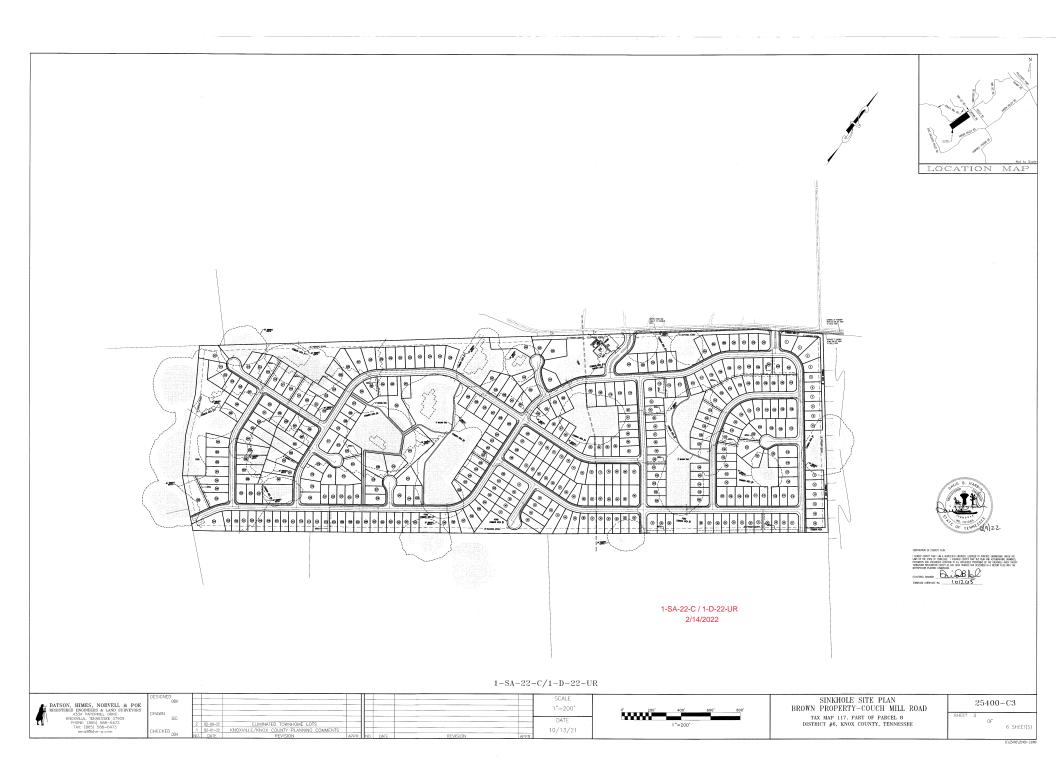


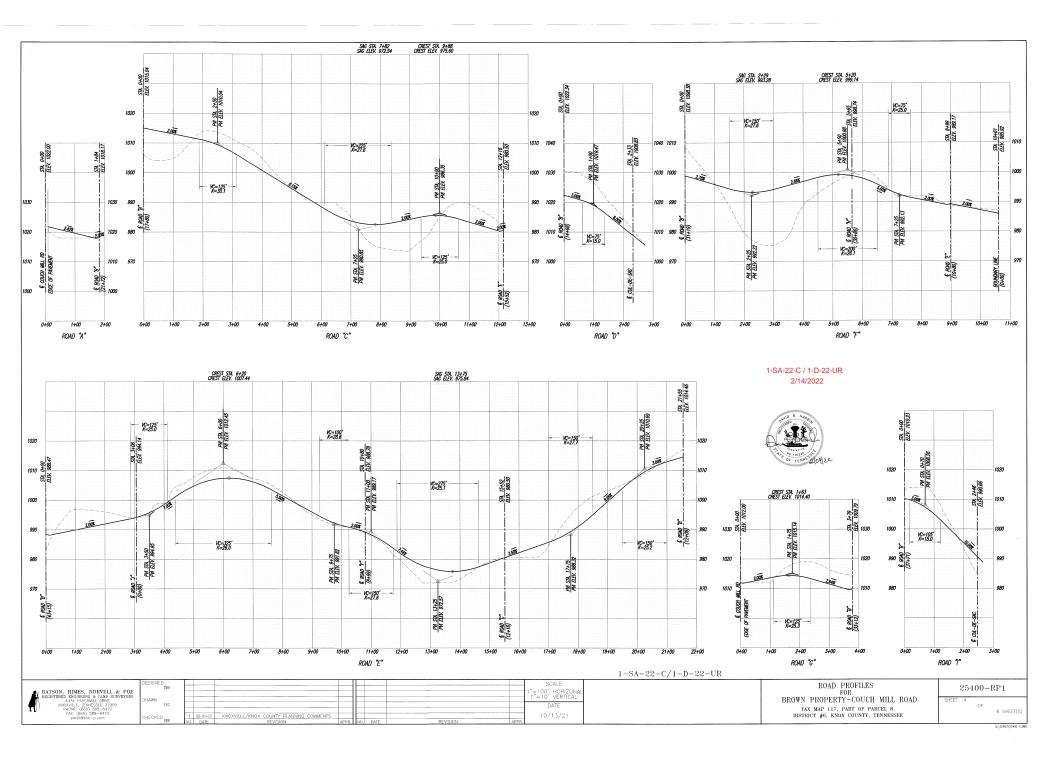
CATEGORY	ACRES	RECOMMENDED DISTURBANCE BUDGET (Percent)	DISTURBANCE AREA (Acres)
Non-Hillside	93.57	100%	93.6
0-15% Slope	13.67	100%	13.7
15-25% Slope	15.44	50%	7.7
25-40% Slope	7.92	20%	1.6
Greater than 40% Slope	0.45	10%	0.0
Ridgetops	0		
Subtotal: Sloped Land	37.48	Recommended disturbance budget within Hillside Protection Area (acres)	23.0
Total Acreage	131.05		

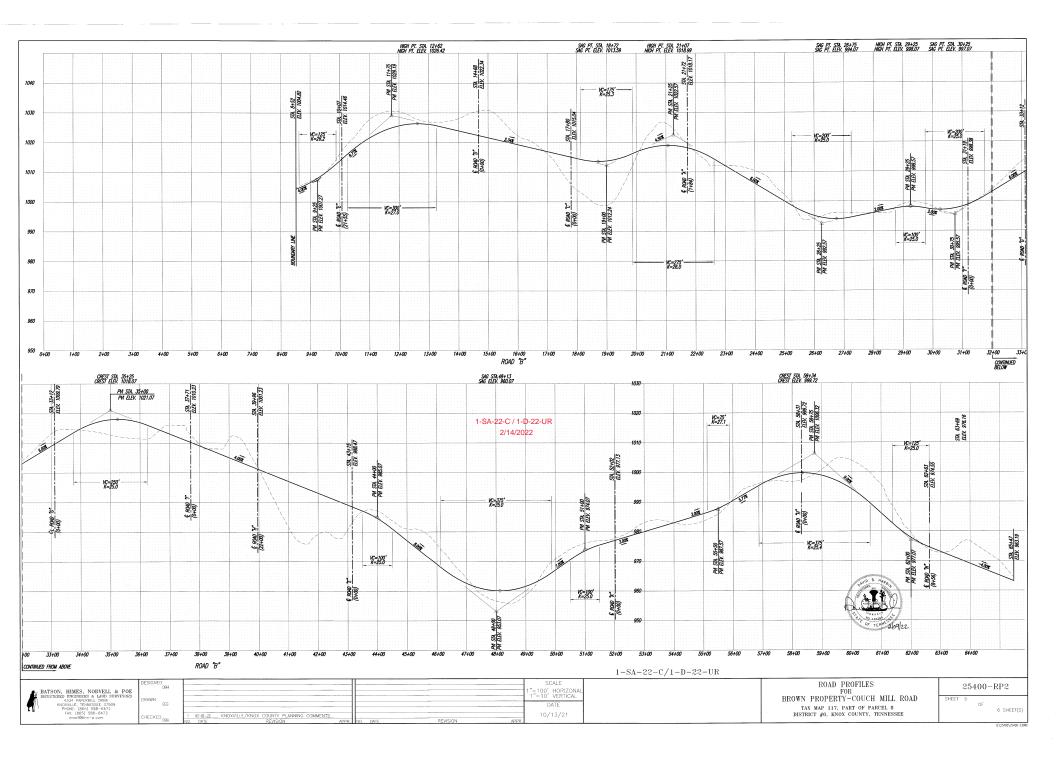


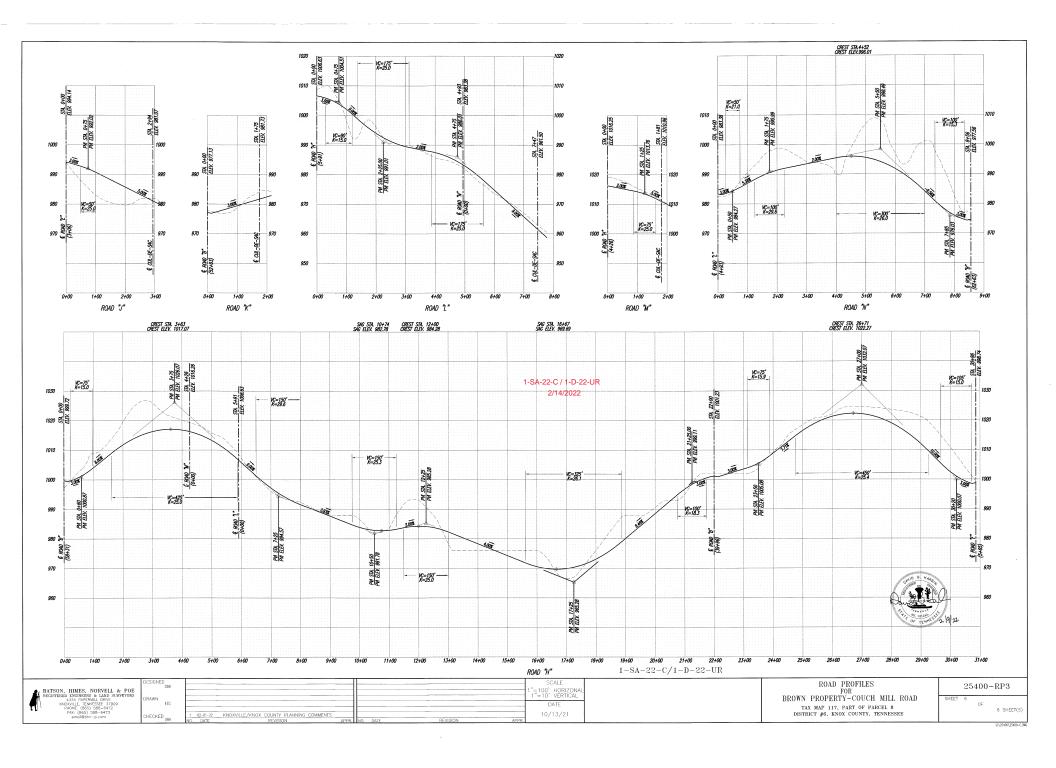














Transportation Impact Study Couch Mill Road Subdivision Knox County, Tennessee



Revised February 2022

Prepared for: Safe Harbor Development 308 Letterman Road Knoxville, TN 37919

> 1-SA-22-C / 1-D-22-UR TIS Version 3 2/18/2022



CONCLUSIONS & RECOMMENDATIONS

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



<u>Sam Lee Road at Steele Road and Swafford Road</u>: The results of the projected level of service calculations for the Sam Lee Road at Steele Road and Swafford Road intersection in the year 2028 were determined to be adequate with respect to vehicle delays. The exception is the Sam Lee Road westbound approach, which is projected to operate at LOS D and F in the 2028 AM and PM peak hours, respectively.

This intersection currently operates with Steele Road and Swafford Road operating freely with the east and west approaches of Sam Lee Road operating under stop control.

Due to the considerable projected 2028 vehicle delays on the westbound approach of Sam Lee Road at the intersection, an additional analysis was conducted with the intersection operating under All-Way Stop Control (AWSC). This type of control would force southbound motorists on Swafford Road and northbound motorists on Steele Road to stop instead of operating freely as currently operating. Modifying this intersection would allow for the Sam Lee Road westbound approach to operate with fewer vehicle delays. However, this benefit for the westbound approach would come at the expense of the higher traveled northbound approach of Steele Road, particularly during the PM peak hour. The analysis showed that the intersection operating under AWSC in the projected 2028 conditions resulted in the following:

TABLE 8
2028 INTERSECTION CAPACITY ANALYSIS RESULTS PROJECTED HORIZON YEAR (WITH THE PROJECT) - ALL-WAY STOP CONTROL (AWSC)

	TRAFFIC	APPROACH/	AM PEAK		PM PEAK			
INTERSECTION	CONTROL	MOVEMENT	LOS	DELAY	V/C	LOS	DELAY	V/C
				(seconds)			(seconds)	
Sam Lee Road at Steele Road	pəz	Northbound Left/Thru/Right	В	12.3	0.440	D	32.9	0.870
and Swafford Road	STOP E	Eastbound Left/Thru/Right	В	11.7	0.440	В	12.6	0.397
	nsig	Westbound Left/Thru/Right	В	10.5	0.236	В	12.2	0.299
		Southbound Left/Thru/Right	A	9.9	0.177	В	10.1	0.167

Note: All analyses were calculated in Synchro 8 software and reported using HCM 2010 intersection methodology

^c Volume-to-Capacity Ratio



a Level of Service

^b Average Delay (sec/vehicle)

As a result of this outcome, the intersection was investigated whether installing AWSC is warranted and a potential solution to combat the projected high vehicle delays on the Sam Lee Road westbound approach. The evaluation was based on the criteria outlined in the Manual on Uniform Traffic Control Devices 2009 (MUTCD) produced by the Federal Highway Administration. The MUTCD defines the standards for all traffic control devices on public roads, including pavement markings, signage, and traffic signals. The MUTCD also includes criteria standards for the installation of traffic signals and AWSC. The criteria from the MUTCD (Section 2B.07) for implementing AWSC is as follows (MUTCD text in blue):

Multi-way stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multi-way stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal.

The decision to install multi-way stop control should be based on an engineering study. The following criteria should be considered in the engineering study for a multi-way Stop Sign installation:

A. Where traffic control signals are justified, multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.

Response: A traffic signal is not planned at this intersection and is not warranted based on the low traffic volumes.

B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.

Response: Knox County Engineering stated that there were three vehicle crashes from 2016-2020. Thus, based on this data, the intersection does not meet that standard.

C. Minimum volumes:

1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours



of an average day; and

- 2. The combined vehicular, pedestrian, and bicycle volumes entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; and
- 3. If the 85th percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 3.

Response: The projected 2028 traffic volumes at the intersection do not fully meet the above criteria. This result is confirmed in a multi-stop warrant evaluation spreadsheet shown in Appendix K. Appendix K also includes a spreadsheet developed and used to calculate the hourly projected 2028 volumes at the intersection for an 8-hour period that includes the proposed subdivision-generated traffic. The 85th percentile speeds are assumed to be less than 40 mph since all the approaches have a posted speed limit of 30-mph.

4. Where no single criterion is satisfied, but where Criteria B, C.1 and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Response: These criteria are not met based on the projected volumes and the crash history.

Other criteria that may be considered in an engineering study include:

A. The need to control left-turn conflicts;

Response: Left-turn conflicts do not appear to be a significant factor at this intersection.

B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;

Response: This intersection was not observed to have any pedestrian volumes.

C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required



to stop.

Response: Intersection sight distance at this intersection appears to be sufficient based on visual inspection.

D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.

Response: No significant existing operational issues were observed at the intersection.

Therefore, the evaluation for the projected 2028 conditions determined that the intersection will not fully meet warrants for AWSC and would not be appropriate for installation. Installing AWSC without meeting the specified MUTCD warrants can result in several harmful impacts. Studies indicate that installing AWSC for intersections that do not meet MUTCD warrants can experience poor stop compliance from motorists and may contribute to motorists increasing vehicle speeds before and after the intersection to make up for "lost-time".

A vehicle queue analysis was conducted to further investigate the intersection as-is in the 2028 projected conditions without modifications. An additional software program was used to determine the projected vehicle queues at the intersection. 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.

The 95th percentile vehicle queue length 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 vehicle queue lengths were calculated from the SimTraffic software.

The calculated vehicle queue results averaged the outcome obtained during ten traffic simulations in the SimTraffic software. The 95th percentile vehicle queue lengths at the intersection operating under existing two-way stop conditions in 2028 are shown in Table 9 and Appendix L.



TABLE 9
VEHICLE QUEUE SUMMARY 2028 AM AND PM PEAK HOUR TRAFFIC VOLUMES

INTERSECTION	APPROACH/	95 th PERCENTILE QUEUE LENGTH		
	MOVEMENT	AM PEAK HOUR	PM PEAK HOUR	
Sam Lee Road at	Northbound Left/Thru/Right	24'	54'	
Steele Road and Swafford Road	Eastbound Left/Thru/Right	95'	86'	
	Westbound Left/Thru/Right	61'	60'	
	Southbound Left/Thru/Right	1.5	3'	

⁹⁵th percentile queues were calculated in SimTraffic 8 software

Ultimately, after investigation, this intersection is not recommended to be converted to AWSC based on the current 2028 projections presented in this study. While the calculations show a v/c ratio greater than 1 with a LOS F in the projected 2028 PM peak hour, the actual vehicle queues on the Sam Lee Road westbound approach are expected to be reasonable, with at most, 2 – 3 vehicles in a queue at any one time.

Due to the ongoing and rapid suburbanization of the Hardin Valley area combined with other large and undeveloped property tracts remaining near this intersection, Knox County should consider the possibility of converting this intersection to a roundabout in the future. The existing land around this intersection is relatively flat and is undeveloped on the north side. To the south, property acquisition from two existing single-family house owners would be required but has areas not currently occupied by structures or driveways.



<u>Couch Mill Road at Sam Lee Road:</u> No specific recommendations are offered for this intersection based on the study analyses and results.



<u>Couch Mill Road/Sam Lee Road:</u> The proposed plan layout shows two new entrances constructed on Couch Mill Road, with most of the generated traffic expected to occur on Couch Mill Road and Sam Lee Road to the east of the development.

3a) Knox County Engineering has published an informal minimum standard relating Average Daily Traffic (ADT) versus road widths. A graph of this minimum standard is shown in Appendix J, and this standard is more related to traffic safety and operations more so than actual road capacity.

The pavement road width measurements conducted for this study showed an average width of approximately 19 feet from the Proposed West Entrance location on Couch Mill Road to the intersection of Sam Lee Road at Steele Road and Swafford Road. Based on a measured road width of 19 feet and the Knox County standard, the maximum allowable ADT would be 3,000 vehicles per day. The existing ADT in 2019 was 910 vehicles. The projected amount of additional daily traffic that the Couch Mill Road Subdivision will contribute between the development site and the intersection of Sam Lee Road at Steele Road and Swafford Road is expected to be 3,484 vehicles per day (3,667 x 95% of residents are expected to travel to and from the east of the subdivision = 3,484 vehicles/day). Adding the existing ADT volumes with the projected trips results in nearly 4,500 vehicles per day. An ADT of 4,500 would indicate that the road width between the proposed subdivision and the intersection of Sam Lee Road at Steele Road and Swafford Road would need to be widened to 21 feet along the entire route. Providing a road width of 21 feet would be appropriate for up to 5,000 vehicles per day based on Knox County's ADT/road width minimum standard.

Following Knox County's standard, Couch Mill Road and Sam Lee Road are recommended to be widened 1 to 3 feet up to a 21-foot width for approximately 3,050 feet between the Couch Mill Road Subdivision Proposed West Entrance and the intersection of Sam Lee at Steele Road and Swafford Road.

3b) Based on the analysis methods presented in the Highway Capacity Manual, the Florida Department of Transportation (FDOT) developed LOSPLAN, a group of software evaluation tools that provides computational methods for analyzing freeways, highways, and arterials road sections. The software provides conceptual level planning results for determining roadway facilities' capacity and LOS. For this report, this software is regarded to be appropriate for use in this level of study.



Various factors are used to calculate the actual "real world" capacity of a roadway. In almost all cases, the actual roadway capacity is reduced as more heavy vehicles comprise the traffic flow, road grades increase, and other aspects are considered. For 2-lane highway segments in the software, FDOT has set the maximum amount of vehicle flow in developed areas at 1,650 vehicles per hour per lane (vphpl). In this study, values were inputted in the FDOT software to ensure a conservative analysis of Couch Mill Road and Sam Lee Road. The analysis included Couch Mill Road and Sam Lee Road at Steele Road and Swafford Road for a total length of 0.6 miles. The major inputs in the software were the following:

- assumed a free-flow speed of 40 mph
- an AADT (Average Annual Daily Traffic) of 4,557 vehicles in 2028
- 2% heavy truck traffic
- Left turn/blockage impact is present due to the lack of left-turn storage bays
- Rolling terrain
- 0% no passing zones present

The AADT of 4,558 vehicles in 2028 was calculated from the ADT volume of 910 vehicles on Couch Mill Road near the project site reported by the Knoxville TPO in 2019, adjusting it upwards with 2% growth up to 2028 and adding the daily volumes generated by the proposed Couch Mill Road Subdivision to and from the east. The additional daily traffic volumes on Couch Mill Road generated by the proposed development were calculated by multiplying the 3,667 total daily generated trips by 95%, which is the assumed distribution of travel to and from the east on Couch Mill Road.

Based on these factors and other inputs, the Level of Service for this segment of Couch Mill Road and Sam Lee Road is calculated to be LOS B in 2028. This result was based on the projected conditions when the proposed Couch Mill Road Subdivision is fully built-out and occupied in 2028. The results from the software are shown in Appendix J.

Thus, it can be stated that the additional trips generated by the proposed project would not unreasonably impair traffic flow along Couch Mill Road through the adjacent Planned Growth Area based on a planning-level capacity analysis.





Proposed Entrances on Couch Mill Road:

The proposed plan layout shows two entrances on Couch Mill Road. The intersections created by the entrances at Road "A" and Road "G" are calculated to operate with excellent LOS and short vehicle delays. A single exiting lane is adequate for these entrances. As discussed previously, separate entering left and right-turn lanes are not warranted at either the Proposed East or West Entrance.



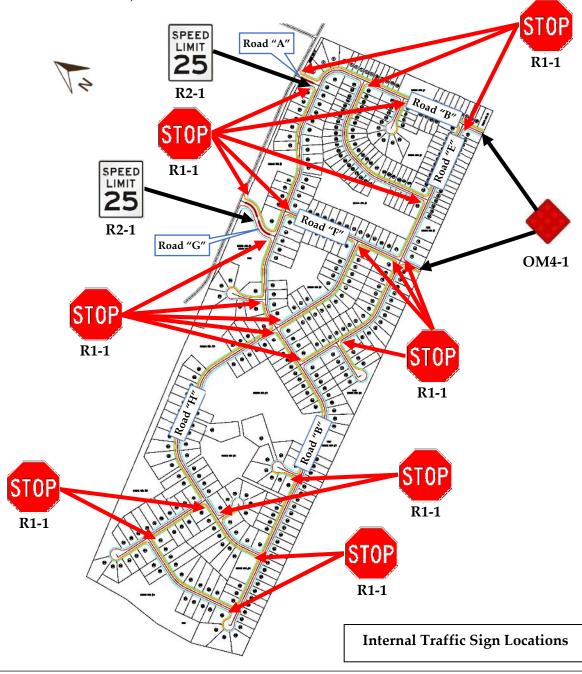
- 4a) It is recommended that Stop Signs (R1-1) be installed, and 24" white stop bars be applied to the Proposed Entrance approaches at Couch Mill Road. The stop bars should be applied a minimum of 4 feet away from the edge of Couch Mill Road and placed at the desired stopping point that maximizes the sight distance.
- Road "G"

 Proposed West Entrance Road "G"
- Ab) Intersection sight distance at the Proposed Entrance approaches must not be impacted by future landscaping, signage, or existing vegetation. Based on a posted speed limit of 30-mph on Couch Mill Road, the required ISD is 300 feet looking in each direction at both entrances, and the SSD is calculated to be 195 feet looking west and 200 feet looking east at the Proposed East Entrance (Road "A"). At the Proposed West Entrance (Road "G"), the calculated SSD is 210 feet looking west and 190 feet looking east. A visual inspection determined that these sight distances are available with caveats. The site designer must ensure that the required sight distances are available and provided in the design plans.



<u>Couch Mill Road Subdivision Internal Roads:</u> The proposed plan layout shows fourteen new public roads constructed within the development, as shown below and Figure 3.

- 5a) It is recommended that 25-mph Speed Limit Signs (R2-1) be posted near the beginning of Road "A" (Proposed East Entrance) and Road "G" (Proposed West Entrance) within the development. End of roadway signage (OM4-1) should be installed at the southern end of Road "B" and Road "F".
- 5b) Stop Signs (R1-1) with 24" white stop bars and other traffic signage should be installed at the locations, as shown below:



It is recommended that the Road "H" approaches at Road "B" and the Road "F" approaches at Road "E" operate under stop control at the 4-way intersection. A fourway stop for all approaches at these intersections would not be warranted unless sight distance is an issue.

- Sight distance at the new internal intersections in the development must not be impacted by new signage, future landscaping, parked vehicles, or other structures. With a proposed internal speed limit of 25-mph, the internal intersection sight distance requirement is 250 feet, and the stopping sight distance required is 155 feet for a level road grade. The site designer should ensure that internal sight distance lengths are met and account for other designed internal road grades.
- 5d) All drainage grates and covers for the residential development need to be pedestrian and bicycle safe.
- 5e) Sidewalks should have appropriate ADA-compliant curbed ramps at intersection corners, and the sidewalks are recommended to be 5 feet minimum in width to meet Knox County regulations. White crosswalks should be marked on the road pavement where pedestrians are expected to cross.
- 5f) The United States Postal Service (USPS) has implemented updated delivery guidelines in new residential subdivisions. If directed by the local post office, the site designer should include a parking area within the development for a centralized mail delivery center.

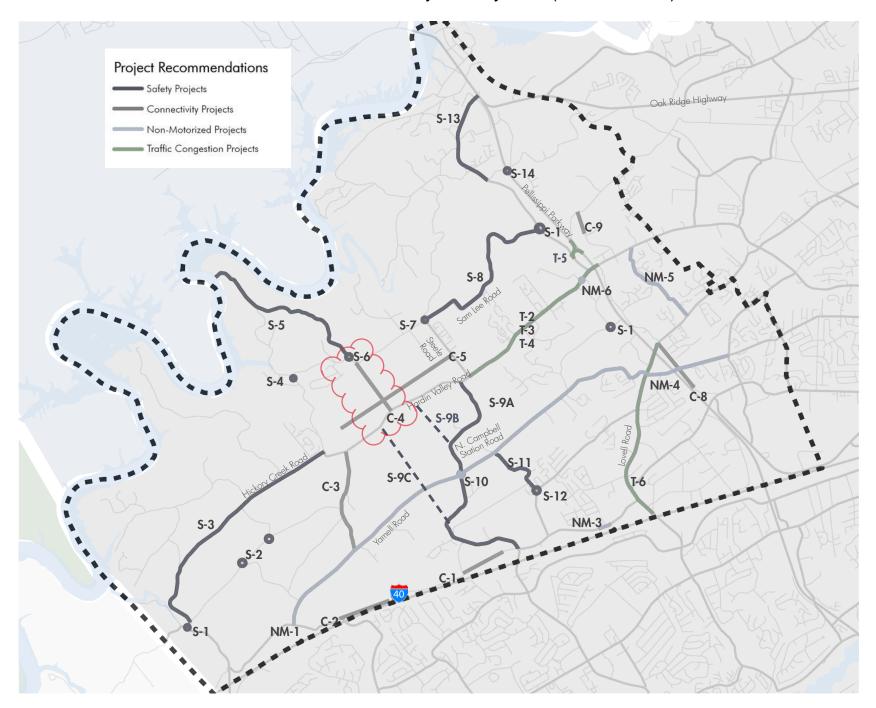


5g) Traffic calming measures might be needed for this development. Several roads within the development have long and straight road segments. The development's possible need for traffic calming measures should be coordinated with Knox County Engineering and Public Works during the detailed design phase.

- 5h) Lots in the subdivision should not directly access Couch Mill Road.
- 5i) Knox County has recently completed a greenway study and showed Couch Mill Road as a route for a new greenway connecting Hardin Valley to Powell. The developer should discuss with Knox County if this potential greenway path is desirable or feasible to implement on the edge of the development property along Couch Mill Road.
- 5j) All internal and external road and intersection elements should be designed to AASHTO, TDOT, and Knox County specifications and guidelines to ensure proper operations.







CONNECTIVITY PROJECTS

	PROJECT	DESCRIPTION	COST
	C-1	New roadway connection between Hatmaker Road and Snyder Road	\$5 M
	C-2	New roadway connection from Hatmaker Lane to Everett Road	\$6.5 M
~	C-3	Improve Marietta Church Road to include additional shoulder width for all users	\$6 M
	C-4	Provide additional N-S connection from Couch Mill Road to proposed E-W connector and Hardin Valley Road	\$3 M
	C-5	Provide new E-W connection from Steele Road to Mission Hill Lane to provide parallel route for Hardin Valley	\$13 M
َ	C-8	Connect Dutchtown Road and Lovell Road, east of Pellissippi Parkway; remove access to Pellissippi Parkway from residential property	\$4.5 M
	C-9	Explore options for N-S connection via Cherahala Boulevard extension	\$2.5 M

NON-MOTORIZED PROJECTS

PROJECT	DESCRIPTION	COST
NM-1	Improve the shoulders on Yarnell Road for all users	\$11 M
NM-3	Complete sidewalk gap on Outlet Drive	\$90 K
NM-4	Provide new bike facilities (either bike lane or wider shoulders) along Bob Gray Road	\$3.5 M
NM-5	Widen Thompson Road with shoulders and potential bike facility	\$4.5 M
NM-6	Option A - Near-term safety improvements for existing Greenway crosswalk to potentially include refuge islands, Rectangular Rapid Flashing Beacon (RRFB)	\$60 K
,.	Option B - Long-term solution being a grade-separated crossing at Hardin Valley Road	\$1.2 M



Request to Postpone · Table · Withdraw

Planning	HARDIN VALLEY FARM	LLC.	2-4-22
KNOXVILLE KNOX COUNTY	Applicant Name (as it appears on the c		Date of Request
2-16-22 2/10/2022		1-SA-22-C	File Number(s)
Scheduled Meeting Date		1-5A-ZZ-C 1-0-ZZ-UR	
POSTPONE			
the week prior to the Plannin applications which are eligible be tabled.	are eligible for postponement if the requing Commission meeting. All requests must be for one 30-day automatic postponeme	st be acted upon by the Planning Cor ent. If payment is not received by the	nmission, except new
SELECT ONE: Д 30 days □	60 days		
Postpone the above application((s) until the Ward 10, 70	Planning Commis	ssion Meeting.
WITHDRAW			
week prior to the Planning Co Applicants are eligible for a re	ay be withdrawn automatically if the req ommission meeting. Requests made afte efund only if a written request for withdr irector or Planning Services Manager. *T	er this deadline must be acted on by t rawal is received prior to public notic	he Planning Commission. e and the request is
TABLE			
☐ TABLE: Any item requested for no fee to table or untable an	or tabling must be acted upon by the Pla item.	nning Commission before it can be o	fficially tabled. There is
By	signing below, I certify I am the property	owner, and/or the owners authorize	d representative.
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Staff Signature	Please Print	Date Pa	id
Eligible for Fee Refund?	s 🗌 No Amount:		
Approved by:		Date:	
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Request to Postpone • Table • Withdraw

Name of Applicant: HARDIN VAILEY FARM LLC

AS IT APPEARS ON THE CURRENT PLANNING COMMISSION AGENDA

Original File Number(s): 1-5A-2Z-C I-D-2Z-UR.

Date Scheduled for Planning Review: 1/13/202 Z

Date Request Filed: 12/23/21 Request Accepted by:

Please postpone the above application(s) until: 2 - L_Q - Z Z	
DATE OF FUTURE PUBLIC MEETING Table Please table the above application(s). Withdraw Please withdraw the above application(s). State reason for request: Post-pone me month Eligible for Fee Refund? Yes No Amount: Approved by: Date: APPLICATION AUTHORIZATION I hereby certify that I am the property owner, applicant, or applicant's authorized representative. Signature: PLEASE PRINT Name: DAVID HARDIO Address: 4334 PAREMILL DE City: Knoxville State: To Zip: 37909 Telephone: 865-588-6472	
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Name: DAVID HARDIN Address: 4334 Papermill De City: Knoxville State: To Zip: 37909 Telephone: 865-588-6472	Signature Louis (Janon)
Name: DAVID HARDIN Address: 4334 Papermill De City: Knoxville State: To Zip: 37909 Telephone: 865-588-6472	PI FASE DRINT
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	City: Vnoxville State: Tn Zip: 37909
ور در	Telephone: <u>865-588-6472</u>
Fax: 165-588-6473	Fax: 865-588-6473
E-mail: harbin @ bhn-p.com	E-mail: harbin @ bhn-p.com

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.

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.

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.



	DEVELOPMENT Development Plan	SUBDIVISION Concept Plan	ZONING ☐ Plan Amendment ☐ SP ☐ OYP
Planning KNOXVILLE I KNOX COUNTY	☐ Planned Development☐ Use on Review / Special Use☐ Hillside Protection COA	⊠ Final Pla t	☐ Rezoning
SAFE HARBOR DEVIEUS Applicant Name		Affiliat	ion holder
1 · 29 · Z Date Filed	Meeting Date (if applicable)		File Number(s) 7-22-C -22-WR
CORRESPONDENCE All Property Owner	r Doption Holder 🛭 Project Surve	A CONTRACTOR OF THE CONTRACTOR	pproved contact listed below.
DAYID HARBIY	BATSOH HIMES	s Howell & Po	State facts and Attendance
4334 PAPERMILL	C.I.,	State	37919 zip
865-588-6472 Phone	Email	n-p.com	4 -4
Hardin Valley Farm Property Owner Name (if different Markey COUCH PITEL TO	LLC 308 LETIERMA LOO X VI II Property Owner Addr	137114	Parcel 8
WIST KNOX Sewer Provider	WLSH Kr Water Provid		Septic (Y/N)
Staff USE ONLY South side of General Location	Couch Will Pd, Wes	tof Caspian Dr	(131,2 acres ct Size

City County District Existing Land Use

Sector Plan Land Use Classification

Growth Policy Plan Designation

DEVELOPMENT REQUEST	4	140	
☐ Development Plan ☐ Use on Review / Special Use ☐ Hillside P	rotection COA	Related City Per	mit Number(s)
Home Occupation (specify)		-	
Other (specify) Detached & attached vesidenti	al subdivision		
SUBDIVISION REQUEST			
COLUMN TO THE PROPERTY OF THE	0	Related Rezonir	ng File Number
Brown Property - Couch Will Road		12-I-	21-07
Proposed Subdivision Name	38 393	12-1	J. K.
	otal Number of Lots Created		
Other (specify) Detached + affailed pes	idential subdice	ंडाठेन	
☐ Attachments / Additional Requirements			
ZONING REQUEST			· · · · · · · · · · · · · · · · · · ·
Reproductive and the second confidence of the		Pending Plat	File Number
Zoning Change Proposed Zoning			
☐ Plan Amendment Change			
Proposed Plan Designation(s)			
Proposed Density (units/acre) Previous Rezoning Requ	uests	- XI	
Other (specify)			
STAFF USE ONLY	Fee 1	,	Total
PLAT TYPE	6108 Con	ucept	iotai
☐ Staff Review ☐ Planning Commission ATTACHMENTS	0100 P	lan	A to a QA
☐ Property Owners / Option Holders ☐ Variance Request	Fee 2	t	\$12,290
ADDITIONAL REQUIREMENTS	1	\ ^	
☐ Design Plan Certification (Final Plat)	Fee 3		(118)
Use on Review / Special Use (Concept Plan)	rees	3	Make
Traffic Impact Study		1	
COA Checklist (Hillside Protection)			
ABTHORIZATION		and the second second second	
DOLA! DOVIN	arbia	11.29.	21
Applicant Signature Please Print	WIDIT	Date	
Ubbucque albucana			
865-588-6472 Phone Number Email	onn-p.com		
DARBY Campbel	11 SAFEHADAY	11.29	.21
Property Owner Signature Please Print		Date	121 pum
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