

**ANDES ROAD SUBDIVISION**  
**Transportation Impact Analysis**  
**Andes Road**  
**Knoxville, TN**

**A Transportation Impact Analysis for the Andes Road Subdivision**

Submitted to

**Knoxville – Knox County Planning Commission**

Revised August 10, 2020  
June 22, 2020  
FMA Project No. 592.007

Submitted By:



8-SD-20-C / 8-F-20-UR  
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## **Executive Summary**

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Ball Homes, LLC is proposing a residential development (i.e. Andes Road Subdivision) with single-family housing located in Knox County. The project is located at the intersection of Andes Road at Old Andes Road north of Middlebrook Pike. The full buildout of the development will consist of 170 single family lots. Construction is proposed to take place this year and this study assumes full build out for the development will occur in 2023.

The driveway connection will be located at the existing intersection of Andes Road at Old Andes Road approximately 365 feet north of the intersection of Ivywood Lane and approximately 1,280 feet north of the intersection with Middlebrook Pike. As a part of the construction of the Andes Road Subdivision an existing portion of Old Andes Road will be widened and renamed Road "A". Road "A" will begin at the intersection of Andes Road and will intersect at Road "Old Andes" at Station 6+14.70. Road "Old Andes" will begin at the intersection of Road "A" and will continue to Station 4+66.37 at which point it will intersect with the existing Old Andes Road.

In order to maintain or provide an acceptable level-of-service for each of the intersections studied, some recommendations are presented.

### **Andes Road at Driveway Connection**

The full buildout conditions at the unsignalized intersection of Andes Road at the driveway connection were analyzed using the Highway Capacity Software (HCS7). Both the eastbound approach and northbound left turn lane operate at a LOS A during both the AM and PM peak hours.

After the completion of the Andes Road Subdivision neither a northbound left turn lane nor a southbound right turn lane are warranted at the intersection of Andes Road at the driveway connection.

### **Subdivision Roads**

Road "A" starting at Station 6+14.70 as well the internal subdivision Road "B", Road "C", Road "E" and Road "F" will have a width of 26 feet in accordance with the "Knoxville-Knox County Subdivision Regulations" amended through February 13, 2020.

Sight distance easements for the internal subdivision intersections of Road "A", Road "B", Road "C", Road "D", Road "E" and Road "F" should be coordinated with Knox County Engineering and Public Works and included on the final design drawings prior to construction of the subdivision.

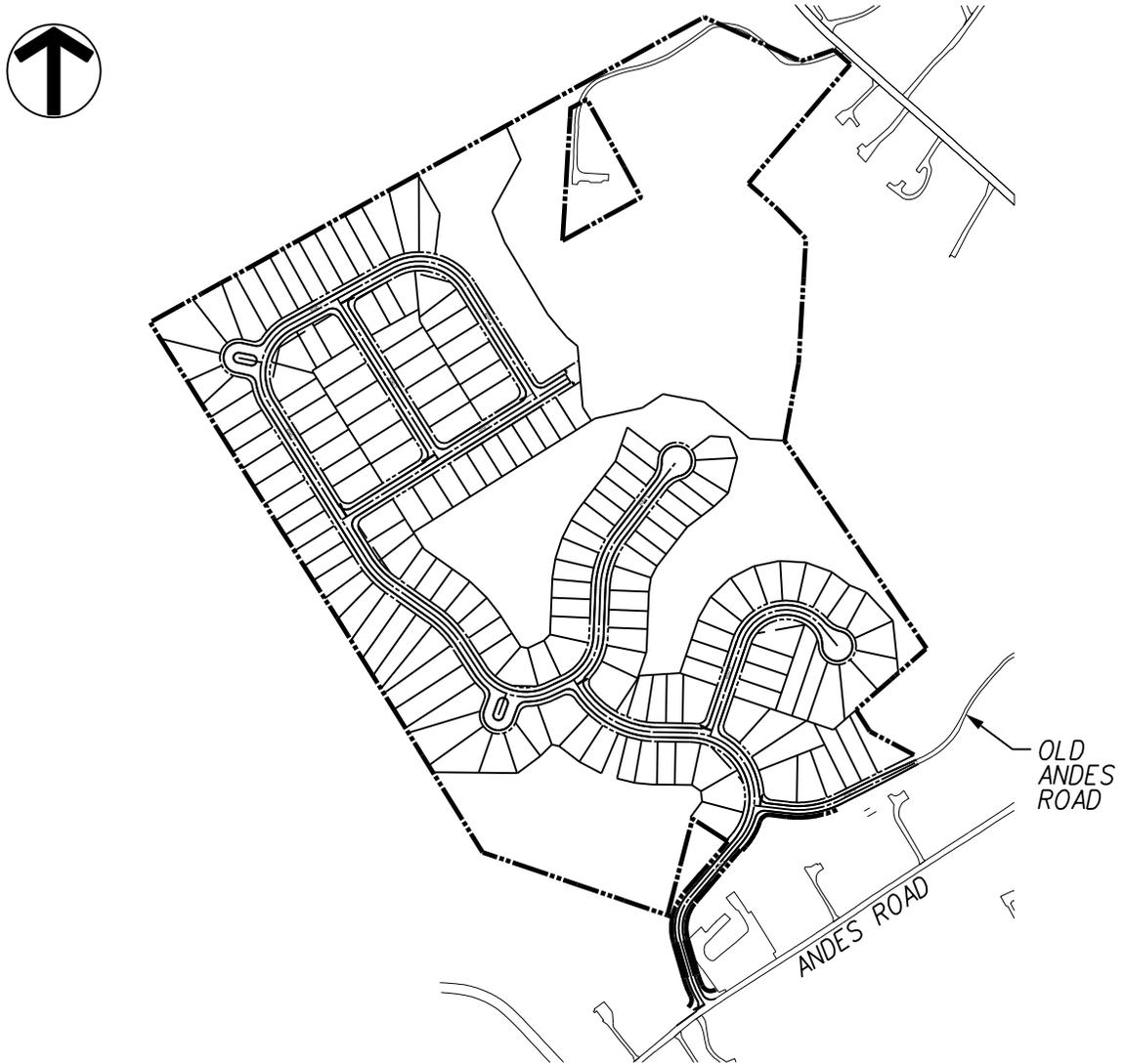


Figure 2: Site Plan

## **4 Trip Generation and Trip Distribution**

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The Andes Road Subdivision proposes 170 single family lots. Single-Family Detached Housing or Land Use 210 was used to calculate site trips for the subdivision using the fitted curve equations from the *Trip Generation, 10<sup>th</sup> Edition*, published by the Institute of Transportation Engineers. The land use worksheets are included in Attachment 5.

The total trips generated by the full buildout of the Andes Road Subdivision was estimated to be 1,694 daily trips. The estimated trips are 126 trips during the AM peak hour and 169 trips during the PM peak hour. A trip generation summary is shown in Table 4-1.

**Table 4-1  
Andes Road Subdivision  
Trip Generation Summary**

Land Use	Density	Daily Trips	AM Peak Hour		PM Peak Hour	
			Enter	Exit	Enter	Exit
Single-Family Detached Housing (Land Use 210)	170 lots	1694	32	95	106	63

FMA calculated the existing PM peak hour trip distribution on Andes Road in the vicinity of the proposed development. The PM peak hour distribution was 55% northbound and 45% southbound and FMA assumed that the AM peak hour distribution would be 45% northbound and 55% southbound.

The directional distribution of the traffic generated by the Andes Road Subdivision was estimated based on the proximity of the subdivision to Middlebrook Pike. The entering trip distribution is 80% northbound and 20% southbound and the exiting trip distribution is 20% northbound and 80% southbound during both the AM and PM peak hours. Figure 5 shows the peak hour trip distribution for the Andes Road Subdivision.

Figure 6 shows the peak hour site trips generated by the Andes Road Subdivision and Figure 7 shows the projected full buildout peak hour traffic after the completion of the Andes Road Subdivision.

## **6 Turn Lane Warrant Analysis**

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The intersection of Andes Road at the driveway connection was evaluated to determine if a right turn lane or a left turn lane are warranted. The Knox County Department of Engineering and Public Works handbook, "Access Control and Driveway Design Policy," was used to analyze the information. Neither a southbound right turn lane nor a northbound left turn lane on Andes Road is warranted. The turn lane warrant worksheets and analysis are included in Attachment 6.

## **7 Conclusions and Recommendations**

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### **7.1 Andes Road @ Driveway Connection**

The full buildout conditions at the unsignalized intersection of Andes Road at the driveway connection were analyzed using the Highway Capacity Software (HCS7). Both the eastbound approach and northbound left turn lane operate at a LOS A during both the AM and PM peak hours.

After the completion of the Andes Road Subdivision neither a northbound left turn lane nor a southbound right turn lane are warranted at the intersection of Andes Road at the driveway connection.

The minimum required sight distance for a road with a posted speed limit of 30 mph is 300 feet in each direction in accordance with the "Knoxville-Knox County Subdivision Regulations" amended through February 13, 2020. FMA measured the sight distance at the existing intersection of Andes Road at Old Andes Road in June 2020. At 15 feet from the edge of pavement the sight distance is greater than 500 feet northbound and 415 feet southbound.

The proposed driveway connection (Road "A") will be located approximately 30 feet north of the existing intersection of Andes Road at Old Andes Road. This realignment of Road "A" will continue to comply with the minimum intersection sight distance requirements.

Andes Road is not classified per the Major Road Plan; therefore it is considered a local street. The minimum intersection spacing required on a local street is 125 feet per the "Knoxville-Knox County Subdivision Regulations" amended through February 13, 2020. The existing intersection of Andes Road at Old Andes Road is located approximately 365 feet north of the intersection with Ivywood Lane. This driveway

connection exceeds the typical minimum separation on a local street; therefore, no change is necessary.

## **7.2 Subdivision Roads**

Old Andes Road at the existing intersection of Andes Road has an average width of 12 feet. As a part of the construction of the Andes Road Subdivision an existing portion of Old Andes Road will be widened and renamed Road "A". Road "A" will begin at the intersection of Andes Road and will intersect at Road "Old Andes" at Station 6+14.70. Road "Old Andes" will begin at the intersection of Road "A" and will continue to Station 4+66.37 at which point it will intersect with the existing Old Andes Road.

Road "A" starting at Station 6+14.70 as well the internal subdivision Road "B", Road "C", Road "E" and Road "F" will have a width of 26 feet in accordance with the "Knoxville-Knox County Subdivision Regulations" amended through February 13, 2020.

The minimum required sight distance for the internal subdivision Road "A", Road "B", Road "C" and Road "E", Road "F" and Old Andes Road will be 250 feet in each direction in accordance with the "Knoxville-Knox County Subdivision Regulations" as amended through February 13, 2020.

Sight distance easements for the internal subdivision intersections of Road "A", Road "B", Road "C", Road "D", Road "E" and Road "F" should be coordinated with Knox County Engineering and Public Works and included on the final design drawings prior to construction of the subdivision.