



Laura Edmonds <laura.edmonds@knoxplanning.org>

# [Planning Commission Comment] Subdivision connectivity example

1 message

**Kevin Murphy** <murphysprings@gmail.com>  
Reply-To: murphysprings@gmail.com  
To: Commission <commission@knoxplanning.org>

Wed, May 13, 2020 at 11:32 AM

Dear commissioners,

Please see the attached letter from me, along with map example, and model ordinance, regarding connectivity for subdivisions. This is germane to 5-SA-20-C (Thompson Meadows, agenda item 19) and 5-SD-20-C (Beeler Farms, Agenda Item 22).

--Kevin

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This message was directed to [commission@knoxplanning.org](mailto:commission@knoxplanning.org)

### 3 attachments




**connectivity-2.5-miles-houses-with-adjacent-rear-lots.jpg**  
2720K

**Subdivision Connectivity Example.pdf**  
502K












**kentucky\_connectivity\_model\_ordinance\_final.pdf**  
242K



49 min (2.5 miles)   
via TN-131 N and Beeler Rd/Beeler Road  
Mostly flat

 Use caution—walking directions may not always reflect real-world conditions

**7301 Foxlair Rd**  
Knoxville, TN 37918

-  Head west on Foxlair Rd toward Springer Dr  
0.1 mi
-  Turn left onto Springer Dr  
0.2 mi
-  Turn right onto Foxhaven Rd  
0.1 mi
-  Turn left onto Inverrary Cir  
0.2 mi
-  Turn right onto Foxbranch Cir  
394 ft
-  Turn right onto Trinity Dr  
246 ft
-  Turn left onto Foxglen Blvd  
0.1 mi
-  Turn right onto TN-131 N  
0.7 mi
-  Turn right onto Beeler Rd/Beeler Road  
0.7 mi
-  Turn right onto Twin Brooks Blvd  
0.2 mi
-  Turn left onto Shimmering Brooks Ln  
249 ft

**6705 Shimmering Brooks Ln**  
Knoxville, TN 37918

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.





Dear Planning Commissioners,

Many proposed concept plans continue to promote the “subdivision as an island” or a castle, with minimum connectivity to the outside world. For gated subdivisions, it is viewed as a safety aspect for keeping strangers away from their homes, and a status symbol of exclusivity. For non-gated subdivisions, it’s a way to guarantee the traffic levels on interior streets since there won’t be connecting traffic.

But this also comes with a cost. These developments constrict mobility options and pedestrian use. They force traffic onto a limited number of arterial roads. And they result in residents being isolated and disconnected from the community.

Two concept plans on the May agenda show this old way of thinking. **I urge you to postpone these items so they can address connectivity.**

1. 5-A-20-C - Thompson Meadows Subdivision Concept Plan - it lacks connectivity stub-out to the adjacent Butler property. A future development of the Butler property could have pedestrian connectivity to Thompson Meadows and allow school children to walk to school at some point.
2. 5-SD-20-C - Beeler Rd - also lacks connectivity stub-out to the parcel to the south. Unfortunately when the Opportunity Ridge subdivision was platted, it did not include any stub-outs.

The Beeler Rd subdivision has an example nearby that illustrates the adverse impact of not putting in this connectivity.



7301 Foxlair Rd and 6705 Shimmering Brooks Lane share a property line - they have a shared fence between them. However, they are located in different subdivisions, with different entrances.

The [shortest path via public roads](#) and walkways is **2.5 miles** between these two houses, which are 200 feet apart. Six (6) minutes by car, and **49 minutes** walking. (see attached Google Maps screenshot)

The Huntington Place, Unit 4 subdivision for Foxlair Rd was [platted in 1987](#) and Foxlair Rd includes provisions to access any future next to it. However, when that subdivision, [Twin Brooks Unit 1](#), was platted in 1999, the developers did not take the opportunity to connect streets. They chose to maximize the number of lots and build a cul-de-sac instead of a road connection.

**The result is a lost opportunity to build neighborhoods and communities, which connect residents together.**

Should the county choose to build a school, park, or another amenity on Beeler Rd, residents on Foxlair Rd and in the Huntington Place subdivision must exit their subdivision, travel along Emory Rd, and then down Beeler Rd to access that amenity. If we planned for connectivity, residents could walk or bike to the park or school.

It's time to raise our current standard of building isolated fortresses. We should be building connectivity. Connectivity alleviates isolation, encourages community. Then we're not just building homes, we're building relationships.

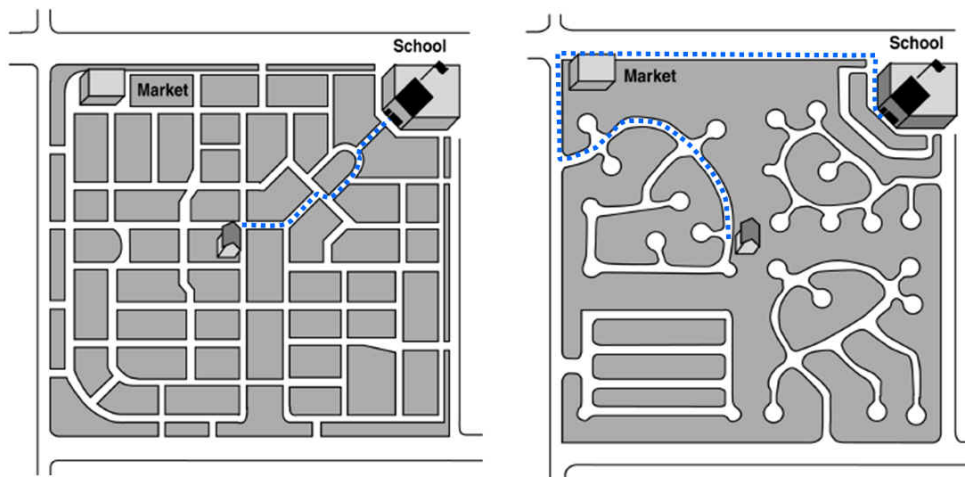
A great example of connectivity is the Island Home neighborhood, which is connected to South Knoxville through several connectors. Non-residents can access the neighborhood and stroll along its boulevards and enjoy the greenways. Residents of Island Home can bicycle and walk to South Waterfront businesses and parks. Residents in and near the neighborhood enjoy increased opportunities to recreate and build relationships because of connectivity.

Please postpone these concept plans and request the developers work on ways to improve connectivity to adjacent properties. Ask them to make these communities, and not just housing developments.

Sincerely,

Kevin Murphy  
4508 Murphy Rd  
Knoxville, TN 37918

# Street Connectivity Zoning and Subdivision Model Ordinance



Prepared by  
Division of Planning  
Kentucky Transportation Cabinet

March 2009



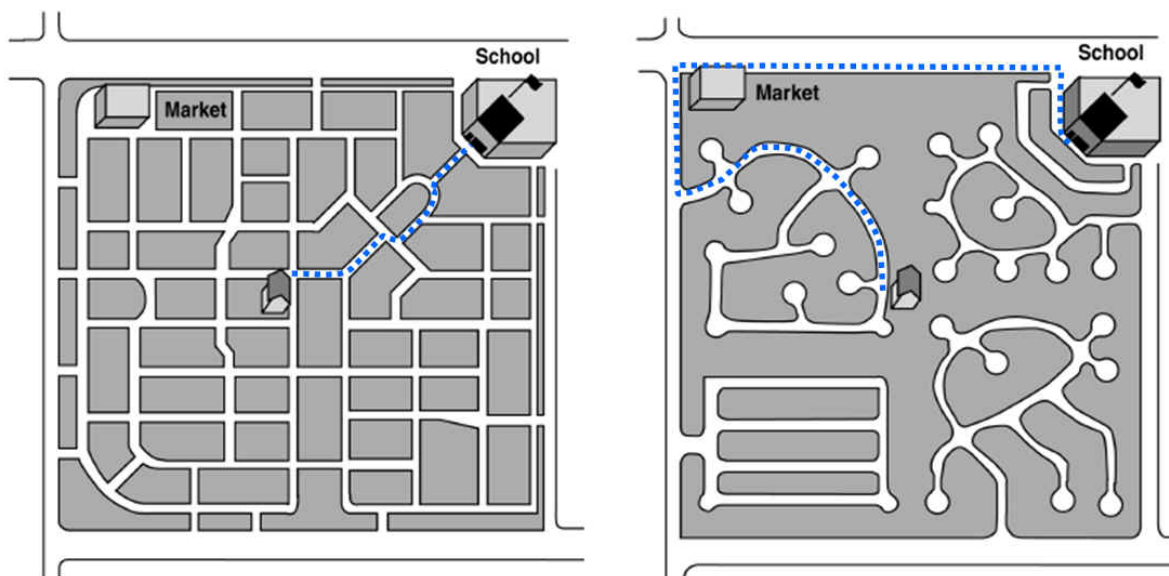
# Street Connectivity Zoning and Subdivision Model Ordinance

## Background & Purpose

The term “street connectivity” suggests a system of streets with multiple routes and connections serving the same origins and destinations. Connectivity not only relates to the number of intersections along a segment of street, but how an entire area is connected by the transportation system. A well-designed, highly-connected network helps reduce the volume of traffic and traffic delays on major streets (arterials and major collectors), and ultimately improves livability in communities by providing parallel routes and alternative route choices. By increasing the number of street connections or local street intersections in communities, bicycle and pedestrian travel also is enhanced. A well-planned, connected network of collector roadways allows a transit system to operate more efficiently.

Over the last forty to fifty years, residential and non-residential development patterns have been created that lack internal vehicular and pedestrian connectivity. The lack of connectivity has created a physical environment that lacks mobility options and pedestrian friendly features. Development trends during the 1960s and '70s encouraged building residential communities with few street connections and numerous cul-de-sacs. It was assumed that communities built with this type of street design had less traffic and fewer traffic delays on neighborhood streets. A recent Metro Portland study found these assumptions to be false. Residential subdivisions that are dominated by cul-de-sacs provide discontinuous street networks, reduces the number of sidewalks, provides few alternate travel routes and forces all trips onto a limited number of arterial roads.

Figure 1 illustrates a more traditional, interconnected development pattern compared to a disconnected, development pattern of the late 20<sup>th</sup> century.



**Figure 1: Shorter trip distance with connected network**

The blue, dashed line represents the travel path a vehicle or pedestrian would have to take from home to school under the two different configurations. The path in the second scenario is two and a half times the length and requires travel on the major streets.

Local street connectivity provides for both intra- and inter-neighborhood connections to knit developments together, rather than forming barriers between them. The street configuration within each parcel must contribute to the street system of the neighborhood.

Research has shown that high roadway connectivity can result in:

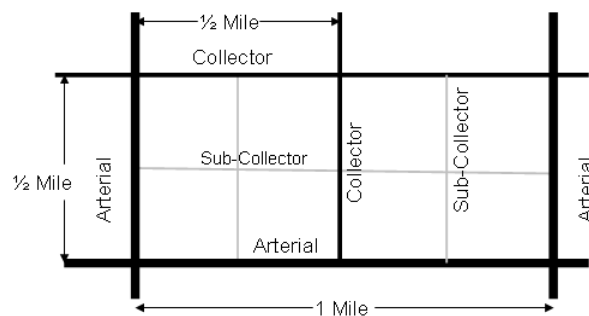
- Reduction in travel distance (VMT) for drivers
- Reduction in travel times for drivers;
- Better and redundant emergency vehicle access;
- More efficient public services access (mail, garbage, transit)
- Improved bicycle and pedestrian routes and accessibility.
- Higher percentage mode share for transit, bicycling and walking
- Safer roads

A 2008 study of California cities compared “safe” road networks (fatal/severe rates less than 1/3 state average) to “less safe” networks (fatal/severe crash rates close to the state average). The results, shown in Table 1, demonstrate that with a higher intersection density i.e., higher connectivity, mode share for transit and non-motorized modes is higher while the fatality rate due to automobile crashes is much lower.

	Less safe	Safe
Average intersection density (#/square mile)	63	106
Walking/bicycling/transit mode share (%)	4	16
Fatality rate per 100,000 population	10.5	3.2

**Table 1**

In addition to the following connectivity ordinance, it is recommended that cities and counties plan their transportation network to have an acceptable roadway (arterials, collectors and sub-collectors) network density. It is recommended that through streets be spaced no more than ½ mile apart, although spacing of sub-collectors (through-streets that feed collectors typically with volumes less than 500 vehicles per day) at ¼ mile spacing is even better (Figure 2). Lower densities result in a higher strain on the existing highway system, often resulting in needed capacity improvements and inefficient operations.



**Figure 2: Arterial & collector road density**



## Connectivity Model Ordinance

The following model ordinance may be adopted in whole or amended to fit local conditions by a planning commission or local government. It consists of two primary components: the internal and external connectivity requirements. Both are critical to ensuring an efficient roadway system.

### Purpose

The *[elected body]* hereby finds and determines that an interconnected street system is necessary in order to protect the public health, safety, and welfare in order to ensure that streets will function in an interdependent manner, to provide adequate access for emergency and service vehicles, to connect neighborhoods, to promote walking and biking, to reduce miles of travel that result in lower air emissions and wear on the roadway, and to provide continuous and comprehensible traffic routes.

### General Standards

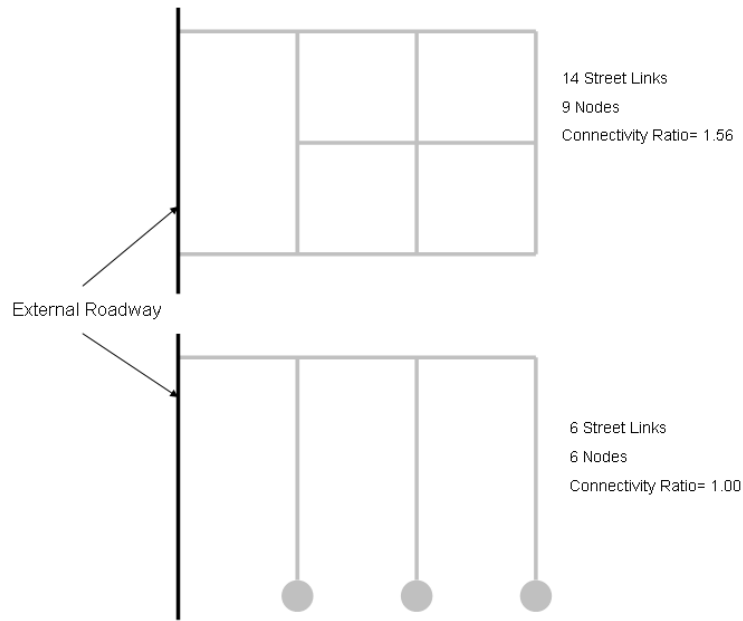
1. A proposed development shall provide multiple direct connections in its local street system to and between local destinations, such as parks, schools, and shopping, without requiring the use of arterial streets.
2. Each development shall incorporate and continue all collector or local streets stubbed to the boundary of the development plan by previously approved but unbuilt development or existing development.

### Connectivity Index (Internal)

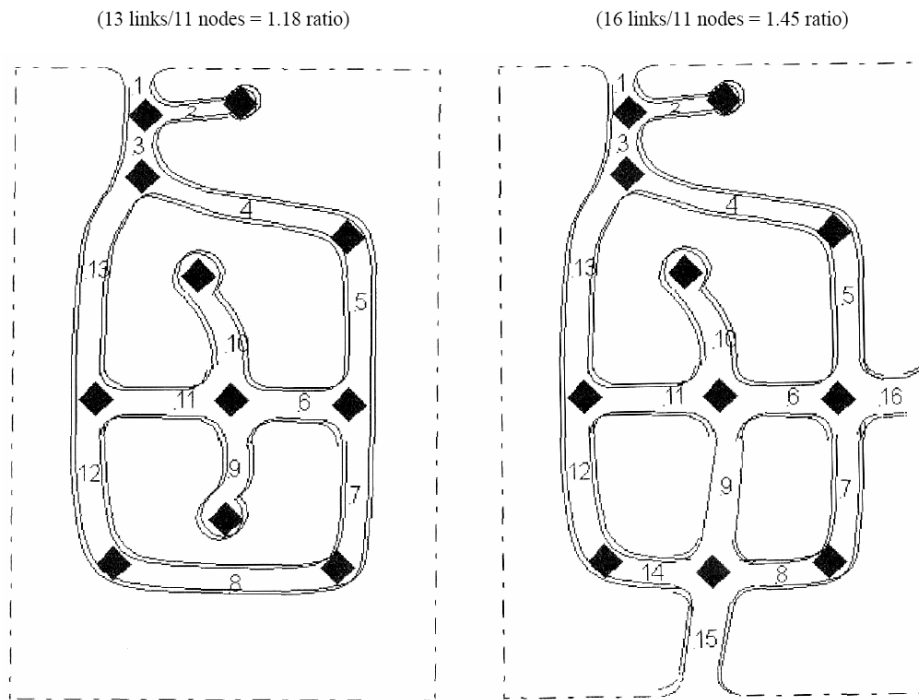
1. To provide adequate internal connectivity within a subdivision or planned development, the street network shall have a minimum connectivity index of *[1.40]*. The desired minimum connectivity index is *[1.60]*. The connectivity index is defined as the number of street links divided by the number of nodes and link ends (including cul-de-sacs and sharp curves with 15 mph design speed or lower).

*Commentary: The higher the connectivity index, the more connected the road network. A connectivity index of 1.40 is a reasonable standard to ensure a connected roadway network; however, there are some cities that require a smaller index, sometimes as low as 1.20. Figures 3 and 4 demonstrate how to calculate the connectivity index.*





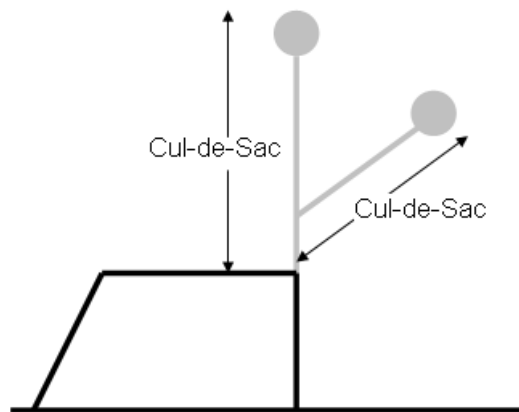
**Figure 3: Example Connectivity Index Calculation**



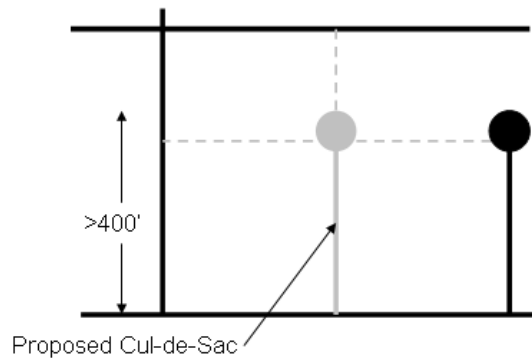
**Figure 4: Example Connectivity Index Calculation**



2. A link is defined as a segment of road between two intersections or from an intersection to a cul-de-sac/stub-out. This includes road segments leading from the adjoining highway network or adjacent development.
3. Nodes are defined as intersections and cul-de-sacs. They do not include the end of a stub-out at the property line or intersection with the adjoining highway network.
4. No dead-end streets shall be permitted except in cases where such streets are designed to connect with future streets on abutting land, in which case a temporary turnaround easement at the end of the street with a diameter of at least *[one hundred (100)]* feet must be dedicated and constructed.
5. Cul-de-sacs shall only be permitted if they are:
  - a. less than *[four hundred (400)]* feet in length (See Figure 5 on how to measure cul-de-sac length.) or
  - b. less than *[six hundred sixty (660)]* feet in length and have a pedestrian connection from the end of the cul-de-sac to another street. (See Figure 6.)



**Figure 5: Measuring cul-de-sac length**



**Figure 6: Providing pedestrian connections from cul-de-sac**



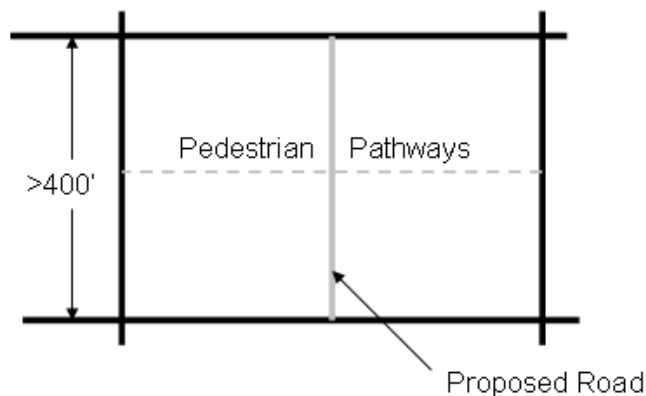
## Connectivity (External)

1. To ensure future street connections where a proposed development abuts unplatted land or a future development phase of the same development, street stubs shall be provided to provide access to all abutting properties or to logically extend the street system into the surrounding area. All street stubs shall be provided with temporary turn-around or cul-de-sacs and the restoration and extension of the street shall be the responsibility of any future developer of the abutting land.

*Commentary: A street stub may either be a local road, collector, or frontage road. The planning director and developer should take into account the purpose of each stub and future traffic patterns that may exist once adjacent land develop occurs and a street connection is made. Cut-through traffic and speeding on local residential streets should be discouraged through proper location and inclusion of traffic calming measures. In contrast, collectors and frontage roads should have logical, direct routes that make cross parcel driving possible. This may include a road that traverses the land from one property line to the opposite property line.*

2. Streets within and contiguous to the subdivision shall be coordinated with other existing or planned streets within the general area as to location, widths, grades, and drainage. Such streets with shall be aligned and coordinated with existing or planned streets in existing or future adjacent or contiguous to adjacent subdivisions. All streets, alleys, and pedestrian pathways in any subdivision or site plan shall connect to other streets and to existing and projected streets outside the proposed subdivision or other development.
3. Street connections shall be spaced at intervals not to exceed [six hundred sixty (660)] feet (1/8 mile) along each boundary that abuts potentially developable or redevelopable land. Blocks longer than [four hundred (400)] feet in length shall have a mid-block pedestrian pathway connecting adjacent blocks. See Figure 7.

*Commentary: Minimizing the block length of local streets allows better access for pedestrians, bicyclists and automobiles. The number may be changed to lower than 660 feet. The appropriate length may be determined based from a typical block length based on historical precedence in the area. It is common for American cities to have block lengths between 200 and 400 feet.*



**Figure 7: Mid-block pedestrian pathways**



4. The *[City Engineer]* may require any limited movement collector or local street intersections to include an access control median or other acceptable access control device. The *[City Engineer]* may also allow limited movement intersection to be initially constructed to allow full movement access.

*Commentary: Local and state access management regulations will regulate the minimum spacing and design. Full intersection access on an arterial should be between ¼ and ½ mile. Partial intersection access, controlled by a median, may be at shorter distances. More frequent access improves overall roadway connectivity but may impact the operations on an arterial roadway.*

5. Gated street entryways into residential developments shall be prohibited.



## References

1. Street Connectivity: An Evaluation of Case Studies in the Portland Region, Metro Regional Government, June, 2004.
2. Best Development Practices: Doing the Right Thing and Making Money at the Same Time, Florida Department of Community Affairs, May 1995.
3. Pedestrian and Transit Friendly Design, Florida Department of Transportation, March 1996.
4. Model Street Connectivity Standards Ordinance, Washington Department of Transportation , 2006.
5. Unified Development Ordinance, Section 31-612, Street Improvement Standards, City of Suffolk, Virginia. (from website August 2008)
6. Unified Development Ordinance, Section 10-1, Street Improvement Standards, City of Kannapolis, North Carolina. (from website August 2008)
7. Fort Collins, Colorado, Land Use Code, Division 3.6, Transportation and Circulation. (from website August 2008; last changes to regs in 2006)
8. Connectivity, Safe Routes to Schools Guide, Pedestrian and Bicycle Information Center (from website August 2008).
9. Street Network Types and Road Safety: A Study of 24 California Cities, Wesley E. Marshall and Norman Garrick, University of Connecticut, 2008





Laura Edmonds <laura.edmonds@knoxplanning.org>

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## [Planning Commission Comment] request to speak on 5-SD-20-C-5 - Beeler Farms

1 message

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**Kevin Murphy** <murphysprings@gmail.com>  
Reply-To: murphysprings@gmail.com  
To: Commission <commission@knoxplanning.org>

Wed, May 13, 2020 at 11:44 AM

Dear Commissioners,

I wish to speak on 5-SD-20-C-5 - Beeler Farms. Please see my attached comments.

--Kevin

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This message was directed to [commission@knoxplanning.org](mailto:commission@knoxplanning.org)

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 **Beeler Rd subdivision 5-SD-20-C.pdf**  
27K

Dear Planning Commissioners,

I request that 5-SD-20-C (Agenda Item #22) be removed from the Consent Agenda and placed for regular hearing. I wish to speak on the item at the meeting Thursday.

1. Please consider requiring connectivity, which I outlined in a separate email a few minutes ago.
2. Sidewalks should be provided on at least one side of this subdivision. There will be quite a slope on this development, and downhill traffic will certainly travel faster than 25 mph, even if the street is designed for 25mph or slower. For pedestrian safety, sidewalks should be provided on one side.
3. Has the developer explained how this concept plan implements the goals identified in the pertinent zoning regulation, Knox County Zoning Ordinance 5.13.01?

The regulations established in this zone are intended to provide optional methods of land development which encourage 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.

I haven't seen any documentation or easily-inferred conclusions that show open space for recreation. All I see is a street, cul-de-sac, required detention ponds, and lots with no sidewalks. I do not see landscapings, pocket parks, benches, shade trees, playgrounds, or any other features that implement the vision of the Planned Residential ordinance.

Sincerely,

Kevin Murphy  
4508 Murphy Rd  
Knoxville, TN 37918