

TO: John Fussa, Planning Director, TOC

FR: Jane Danielewicz, Chair, Climate and Environmental Advisory Commission (CEAC)

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CEAC'S vision for future development in Carrboro includes high-density, smart development that is sustainable, resilient, and grows the tax base. We favor development that doesn't just minimize impact on the natural environment, but relies on and enhances the natural environment. Achieving smart development depends on trees, green infrastructure, ecological and landscaped open space, and urban forest conservation and restoration plus smart construction practices and energy efficient buildings that include solar and geothermal.

In general, CEAC would like the UDO to include the following: (1) preserve and expand greenspace/forested areas; (2) design with land contours; (3) tackle urban heat islands; (4) prevent development in the floodplain and reduce runoff; (5) limit impervious surfaces; and (6) require native plantings that result in biodiversity and healthy ecosystems connected through corridors and trails; (7) encourage smart building construction techniques that reduce building energy loads and include renewable energy; (8) support infrastructure that leads to more biking, walking and riding the bus in combination with green features—trees, shade, plantings, etc. Transportation infrastructure and green infrastructure should support and complement each other rather than be in competition with each other. Since the Transportation Commission has specific expertise in this area, CEAC will not comment on those aspects of the code diagnosis.

CEAC would like to offer developers incentives, such as increased density or height and expedited permit processing, only in exchange for (or some combination of) the following:

- Additional natural and ecological open space
- More trees on site and urban forest improvement to improve air quality and provide shade with more layered plantings to support biodiversity.
- Enhanced green infrastructure to manage rainwater and stormwater, cool the environment and reduce flooding.
- Enhanced energy features related to solar and renewable energy.

Note that the incentives listed above are not meant to be exclusive to one another. For instance, making a development solar ready and including passive solar features would not be sufficient to increase density or height. Incentives can be combined to warrant increased density, etc. This list is not exhaustive but illustrates our position. We ask that incentive charts be created by Codewright in the next draft of the UDO so CEAC may review them.

In addition, CEAC favors offering proffers for developers to fund tree planting and preserve open space anywhere within Town limits.

See code analysis section 8.3.

CEAC's comments focus on six primary areas, plus appendices:

1. Site Design
2. Open Space
3. Green Infrastructure
4. Native Plants
5. Trees
6. Energy
7. Appendices

We give general comments about each area below, followed by specific comments that connect them to numbered sections of the code design.

1. Site Design.

CEAC's number one priority is compact and connected site development that maximizes available natural, ecological and landscaped open space. We oppose mass grading and emphasize using contour grading. We support reducing the total percentage of a development that can be graded at one time.

The UDO should require developers to identify significant trees and conduct a slope analysis BEFORE they begin the design phase to allow designers to orient the development to better fit in the natural drainage patterns, existing forested areas, and be oriented to allow for maximized solar production, where appropriate. (In no circumstances should mature trees be removed to install solar panels.)

The development should be designed to preserve wildlife corridors as well as include linear parks and transit corridors, such as trails and greenways.

We generally support Conservation subdivisions, but would like to see more dense development and more affordable housing. The existing neighborhood of Pacifica in Carrboro represents a good example.

See code analysis section 3.1, 8.3.

- a) Prioritize site design with nature. Minimize site disturbance: Instead of clearing a site completely, developers can prioritize design that works with the natural landscape and native ecosystems. Developers should never strip topsoil from building sites. If removed temporarily for construction, it must be replaced on the original site.
- b) Preserve existing natural assets: Identify and protect significant trees, natural drainage patterns, and healthy soils. Protect and enhance existing natural areas, like streams and wetlands.
- c) Design with topography: Use the natural slope of the land to direct and manage stormwater through bioswales and other GI features rather than relying on engineered "gray" infrastructure.

- d) Developers should create large areas of green open space to maximize natural areas that will support the most biodiversity. When planting in medial strips, allow for wider strips to accommodate trees and layered shrubs (not grass).
- e) Require developers to plan for sustainable site maintenance.
- f) Require developers to plan for connectivity: connect green spaces to form corridors that allow people and wildlife to move through the area. This provides ecological benefits and creates desirable trails for residents.

2. Open Space.

CEAC disagrees with any reduction of Open Space requirements for any reason in the UDO. We oppose allowing reductions in open space requirements if the open space was made publicly accessible.

In general, we agree that the concept of open space needs to be better defined in the UDO (for example, what is passive or active open space?). This new definition should reflect our concerns with green features.

Generally, CEAC's considers Open GREEN Space to involve conserving and restoring existing natural areas, preserving trees, native plantings, layered landscapes, unpaved trails, natural ponds, etc. We want to cultivate a healthy, biodiverse, native plant habitats in all new or redevelopment areas.

Open space in downtown areas should be recreational and civic spaces, such as parks, plazas, town squares, and community gardens, not outdoor dining, seating and performance spaces.

We would prefer fewer open spaces covered in turf grass and more that conserve and cultivate natural and ecological spaces. This border screens should not constitute all of the open green space. Screens should also provide layered habitat. We do not regard recreational fields (mowed grass), small strips or thin screens, playgrounds, swimming pools, or other recreational features as Open Green Space.

Perhaps there can be two categories: Open Green Space as distinct from Open Recreational Space, with percentage requirements for each. The two categories should not be combined or condensed. Recreational space cannot be traded or substituted for green space.

See code analysis sections 3.5 and 5.3.

- a) Define "open space" and what is entailed in "passive" or "active" open space. Create new, less confusing, terminology to refer to types of open space.
- b) Prefer planted open space (layers of plants/trees), forested areas, over turf grass. Mowed turf should not count as open space.
- c) Do not reduce open space generally (unless the trade is for green infrastructure features).

- d) Use developer incentives to increase “open space” over the required percentage such as additional building height, etc.
- e) Conserve and plant natural and ecological spaces.
- f) Designate conservation areas.
- g) Incorporate green features that support dense downtown developments to meet open space requirements, such as the following:
 - I. Plant trees and use vegetation to reduce heat and minimize building energy use: provide shade trees, hedges, plant layers, windbreaks (one or two rows of plants), screens (with layers) or shade structures, reflective pavements to lower surface temperatures.
 - II. Green roofs: Layers of vegetation and soil built on rooftops that provide insulation, reduce the urban heat island effect, and absorb stormwater.
 - III. Living walls: Vertical gardens or green facades that reduce building

3. Native Plants.

CEAC supports using native plants but allowing for a small percentage of non-native plants. All invasives should be removed. Exotics should not be removed as long as they are not invasives.

See code analysis section 3.2

- a) Plant 90% native plants (native to the Piedmont area). Note: Requiring 100% natives may have unintended consequences. Conditions may exist where a non-native plant may be the best choice, e.g. fruit trees, etc.
- b) Focus on using keystone native plants. Create a bio-diverse habitat. Consider greater incentivizing for “keystone species,” the roughly 20% of native plants that are the most beneficial plants in terms of biodiversity, especially the large canopy trees.
- c) Protect against deer predation in Carrboro. Choose deer-resistant native plants or provide protective fencing for all native plants.
- d) Never plant invasives of any kind. From the existing landscape, remove all invasives. However, exotic (non-native) plants which are not invasive do not have to be removed.
- e) Conserve and restore native plants and trees.
- f) Plant layers of vegetation, including groundcovers, shrubs, perennials, and trees.
- g) Distinguish between open space areas used for recreational activities and green open space that is planted with trees, shrubs, gardens, etc. Establish guidelines or percentages for planted open space vs. recreational open space. Use incentives to encourage the use of native grasses and groundcovers over turf grass.
- h) Some open areas of turf are essential design elements for recreational use. Such turf areas must be of a size and shape that is usable for active recreation.
- i) Limit large areas of turf grass in open green space (that is not recreational). Areas not intended for active recreation should prioritize flowering perennials, native grasses and groundcovers instead of turf.

- j) Define a minimum area where no turf grass can be planted. In minimal areas such as medial strips, around trees and plantings, etc., require planting native grasses and groundcovers. For instance, a minimum areas could be simply defined as 10' wide, with larger areas encouraged, depending on the development.
- k) Use incentives (over the minimums and required open space requirements) to increase development space planted with native grasses and groundcover and to decrease the space covered with turf grass, which requires pesticides, fertilizers, and expensive maintenance (that adds to pollution if gas powered).
- l) Provide extensive appendices: including a list of native plants, invasives, keystone species, and deer resistant plants etc.

4. Trees.

Trees (neighborhood trees, street trees, urban forests) are of primary importance in achieving all the goals that CEAC supports in the UDO. Most importantly, trees should be their own new, robust section in the UDO code (not be relegated to an appendix as in the old LUO). Trees remove and store greenhouse gases, support biodiversity, improve air quality, protect against floods and water pollution, and cool communities and lower energy use.

CEAC acknowledges that all development must result in cutting down trees, but they would like the UDO to preserve trees where practicable. We advocate preserving trees with contour grading and open green space requirements. In the past, developers relied on a weak version of “reforestation” where developers clear cut and replant some young, isolated trees along the roads, etc. Such limited plantings do not even come close to the significant trees and plantings needed after mass-grading to replace what was lost. Instead, we want developers to conserve and refurbish natural areas to count for open green space i.e. remove invasives and plant natives in the existing natural areas, including trees, understory layers and groundcovers to create a rich, biodiverse habitats. Note: Exotic trees can remain as long as they are not invasives.

Shade requirements for parking lots should provide directional, rather than radial, shade requirements that prioritizes the most effective shade (south and west). Sidewalks, parks/playgrounds, walkways, trails, should also be directionally shaded by trees.

In circumstances where parking lots/paved areas are not hospitable to trees, we are open to allowing non-living shade, such as solar canopies.

New code will have to be written for trees. For example, both Durham and Raleigh have extensive codes about trees. Also see code analysis section 3.2; 8.3

- a) Plant abundant trees (tree clusters) to create and restore urban forests.
- b) Conserve and protect urban forests, existing street trees, neighborhood trees.
- c) Plant abundant trees where they will shade buildings and outdoor space
- d) Include irrigation bags/disks for newly planted trees
- e) Plant trees that can cope with the climate changes expected over their lifespan

- f) Choose native trees/plants that are climate adapted, long/lived and sequester the most carbon. (Add these features to the Tree Appendix.)
- g) Enhance shade and shading requirements for parking lots, Add some shade requirements sidewalks, trails, walkways, bus stops, tot lots, and parks.
- h) Choose trees over canopies for shade wherever practicable.
- i) Instead of providing radial shade, plant trees to create directional shade (south and west). Design the building site to allow for trees on these sides.
- j) When an area is not hospitable to trees, allow an option for abiotic, functional shade— something like a little solar panel.

5. Green Infrastructure.

We defer to the SWAC and their expertise in this area. CEAC agrees with the SWAC's memo and questions submitted earlier to the consultant. However, we want to emphasize and reinforce important features the UDO should include from CEAC's perspective. Green infrastructure is highly effective in manage rainwater and stormwater, in cooling the environment and reducing flash flooding, while simultaneously promoting a healthy ecosystem. In addition, many functional green infrastructure stormwater features can be designed as amenities.

See code analysis sections 3.3; 8.8

We recommend the following:

- a. Rain gardens and bioretention cells: Depressions in the landscape planted with native vegetation that capture and absorb stormwater runoff from roofs and pavements. Use plants and tree varieties suited to absorbing water.
- b. Vegetated bio-swales: Shallow, sloped channels that slow and filter runoff from roads and other impervious surfaces.
- c. Green roofs and green walls.
- d. Constructed wetlands (not fenced retention ponds).
- e. Green streets and alleys with trees, planters, planted drainage wells, etc.
- f. Permeable pavement: Driveways, walkways, and parking lots that allow rainwater to seep into the ground rather than creating surface runoff. We advocate for using interlocking pavers or other perforated surfaces and not the type of expensive, hard to maintain smooth "permeable" concrete or asphalt. That said, permeable pavement is our least favorite option included under green infrastructure and should not be the only type of green infrastructure a developer includes.

6. Energy.

In the UDO, CEAC favors including renewable energy practices, such as solar and geothermal, smart, energy efficient building construction methods, and dark sky lighting techniques to combat evening light pollution.

There was not much in the code analysis on this topic to reference.

See code analysis sections 3.4; 3.10

- a) Encourage smart building construction techniques that reduce building energy loads through considered site placement on the lot, weatherization and shell details, efficient Mechanical, Plumbing and Electrical layout and choices and high performance windows and HVAC equipment."
- b) Establish and promote wildlife and community friendly lighting standards to prevent light pollution such as those promoted by the International DarkSky Association (IDA): <https://darksky.org/about/our-strategy/>.

7. Appendices.

Developers will need accessible and updated information regarding trees, plants, and where to obtain native plants. Other appendices that may be helpful to developers may cover energy, green infrastructure, light pollution reduction, etc. Such appendixes can be changed, upgraded, and improved frequently. The old appendices, e. g. on trees, screens, etc. in the LUO should be replaced by updated ones. CEAC has been collecting resources for constructing such appendices. We are happy to share our resources at your request. CEAC recommends making robust appendices that would include the following:

Appendixes will be needed for

- 1. Native Plants (to the Piedmont), including keystone plants
- 2. Deer-Resistant Native and other plants
- 3. Invasive Plants and Trees
- 4. Plants (shrubs, ground covers, grasses, etc.) good for layering.
- 5. Native Trees that are good for shade, promote biodiversity, tolerate a range of conditions, are long-lived, and absorb the most carbon.
- 6. Lists of Local and State sources for Native Plants (nurseries, stores, online sites, etc.)
- 7. Others appendixes may include sources related to energy efficiency, smart building practices, light pollution prevention, etc.

Members of CEAC thank you for the opportunity to present our recommendations. We are willing to meet at any time to discuss these comments or to clarify or to give additional feedback on the code analysis. We welcome questions and further discussion.