

February 20, 2015 Green Infrastructure Working Group Meeting Notes

Land Cover and Natural Function

The following largely represents comments that are not reflected in the power point slides—please refer to the presentation as well. Presentation URL:

http://austintexas.gov/sites/default/files/files/Watershed/watershed_ordinance/GIWG_2_20_15_hand_out.pdf

Link to District Profiles:

<http://www.austintexas.gov/department/watershed-protection-council-district-profiles>

Review of objectives

Objective: Discuss best practices & challenges relating to land cover and natural function for new development & redevelopment.

This process is interrelated with all of the other CodeNext Working Groups (Code Issues for Affordability; Infill, Compatibility, and Missing Middle Housing; Obstacles for Small Business; and Subdivision Regulations). We want to set up some sort of conference committee with these groups.

Why perviousness matters

Level of imperviousness on a site or watershed is the main driver for health and safety issues relating to flood, erosion, & water quality. As impervious cover increases in a watershed, the percentage of rainfall converted to runoff also increases (see the graph on slide #5, which is derived from sites throughout Austin). This process starves creeks of baseflow that sustains them during dry periods, while the increase in runoff contributes to channel erosion and flooding. Sensitive species can be impacted at as little as 5% impervious cover in a watershed, and urban creeks begin to cease supporting life at 25% watershed impervious cover (see slide 6). Pervious areas with well-functioning soils and vegetation are needed to mitigate the damaging effects of impervious cover. Well-functioning pervious areas produce multiple benefits: maintaining baseflow, suppressing excess stormflow, removing pollutants, and supporting vegetation and soils.

The goal of reducing the damaging effects of impervious cover can be met through multiple land use strategies (see slide 7)—limiting impervious cover on sites (Scenario A), concentrating development in a small portion of a watershed (Scenario C), or some combination of the two (Scenario B). Our job is to find a balance between maintaining natural function in a watershed and accommodating Austin’s growth in a way that is consistent with Imagine Austin. On dense sites, thoughtful site design can go a long way towards furthering natural hydrological function. Dense sites can 1) “disconnect” impervious surfaces from the drainage system to use stormwater beneficially on-site, and/or 2) include structural engineered controls that can make a high amount of impervious cover “act” like less (see slides 8 and 9). (“Disconnection” of impervious cover means that impervious cover, such as roofs or pavement, is routed to pervious areas where runoff can infiltrate into the soil or be stored in basins or tanks rather than proceed to a pipe or other conveyance where such infiltration and storage is impossible.)

Austin's existing requirements (see slide 10)

It is important to remember that impervious cover limits form only one component of our three main categories of watershed protection regulations:

- 1) Impervious cover limits
- 2) Structural controls
- 3) Setbacks from sensitive features (e.g. streams, karst features, springs, wetlands, etc.)

While structural controls represent an important watershed protection tool, they cannot completely replace impervious cover limits. Especially in sensitive watersheds, there is no substitute for the passive and natural function of pervious areas. Structural controls are an active system, which must be maintained actively. Failure to provide consistent, ongoing maintenance can cause these controls to function poorly or not at all. Passive, nonstructural approaches, such as impervious cover limits, need less active maintenance and are therefore considered more reliable. Furthermore, there is no redundancy in larger controls—a risk that we cannot afford to take in the water supply areas. Because of these concerns and an Imagine Austin directive to limit land use and transportation development in sensitive areas (LUT P22, Imagine Austin, p. xx), we recommend retaining the existing impervious cover limits in the Drinking Water Protection Zone.

Because urban watersheds were largely built-out before we understood the connection between impervious cover and hydrological function, the less-developed suburban watersheds present the biggest opportunity to retain natural function as they develop. However, it is still useful to regain some level of natural function in urban watersheds. In these urban and suburban watersheds, we ask: How do we ensure that pervious areas are *functional* areas? How do we restore natural function to sites that are almost entirely impervious? In doing so, we shift the focus from limiting impervious cover to ensuring that the *quality* of pervious areas is high.

Other national models (see slides 13 – 15)

1. Colorado Model (Parker, Colorado): Publically Accessible Open Space
 - a. Focused on green space and connectivity (our “open space” can be hardscaped)
 - b. This model requires that the landscape architect be brought in early along with the engineer and builder for improved coordination
 - c. Our understanding is that there is a high-level pre-planning process before the review process in which the developer lays out the general plan for open space (with input from the city).
2. New Hampshire Model (state model ordinance): Effective Impervious Cover Limit
 - a. Net gain over 10% site impervious cover must be infiltrated onsite.
 - b. Must demonstrate that impervious cover over the limit does not directly impact the rate and volume of stormwater runoff.
 - c. Use of structural controls will get more and more difficult at higher impervious cover levels.
3. Florida Model (Lauderhill, FL): Pervious Area Requirement
 - a. Minimum of 30% pervious area with weights given to various pervious surfaces

Landscaping = 100%

Stormwater Ponds = 50% (give full credit to green stormwater infrastructure?)

Green Roof = 200%

Porous Pavement = 50%

Comments and questions from the full group (paraphrased)

1. The focus on the need for perviousness and natural function is not just conjecture –it is based on science, data collection, and 50+ years of experience.
2. Any increase in rate or volume of stormwater is detrimental. We used to track just flow rate. Each site must manage its own water—this should be our basic philosophy. In some locations, this will be difficult, however, since the clay soils east of Lamar are basically impervious after ½ inch of rainfall.
3. We must consider the large variations in rainfall in Austin, and extreme rainfall events (“rain bombs”), which are different from many other areas of the country.
4. The new council may not be educated about urban streams, so our assumptions may not be the assumptions of the current council. They need to be educated about the issues.
5. Council has been told [in a policy session] that our streams are “dead.” This is not accurate; they are very much alive, but need help. We must clearly explain to the public the positive connection of creeks to our community’s wellbeing; this connection is not widely understood.
6. Our rain patterns are very different than in Colorado, New Hampshire, or Florida. These national models will have to be tweaked to suit our needs.
7. Question: What are the required drawdown times for structural controls?
Answer: Flood = 24 hours maximum; Water Quality = 48 hours maximum; Rain Cistern = 5 days (with alternate criteria available for specialized systems).
8. Question: Is there a database of green infrastructure projects?
Answer: Yes, if they are permitted/it gets stormwater credit/it is part of the development process and all controls are tracked in our GIS mapping system and [available on our web viewer](#). (link: <http://austintexas.gov/department/austins-small-scale-green-infrastructure>). Others can be added if they are registered here (link: <http://austintexas.gov/online-form/raingarden-submission>).
9. For redevelopment projects in which the zoning impervious cover limit is lower than the existing amount of impervious cover, the project will usually just do a remodel of the building so that they do not have to tear out any impervious cover, thus neither pervious improvements nor stormwater controls are provided.
10. Concern that single-family houses and duplexes are being built in excess of impervious cover limits in residential areas without being inspected and corrected.
11. Education is important.
12. Need to firm up construction phase controls—90% of pollutants that leave a site do so during construction. [Staff note: Historically true for sediment prior to the use of construction-phase erosion & sedimentation controls.]
13. Must integrate WPD staffers early on in any project (public, private, etc.) for watershed protection perspective.

14. Such a system of distributed, decentralized controls is a real paradigm shift, and we must understand all the consequences of such a shift. The city is already having trouble inspecting the controls we have, much less the addition of hundreds (thousands?) of new rain gardens. [Staff note: this will be one of the subjects of discussion in our upcoming “Beneficial Use of Stormwater” session on April 10.]
15. Could use technology and mapping to conduct inspections instead of “boots on the ground.”
16. Even if CodeNEXT adopts a form-based code in areas of the city, form-based codes are concentrated on building form. There is therefore no code for the site, only the structure. Need to add the site and its landscaping to the form-based code discussion. We need to define the parameters that we want included and what we want those parameters to look like, and soon!
17. There is no requirement to bring things up to standard after an inspection. Just have to notify the new owner that they are out of compliance.
18. Need a performance-based code (an “expert system”), in which the developed site must match the predeveloped curve number (engineering measure used to calculate stormwater rate and volume). The current system is prescriptive, results in cookie-cutter designs, and does not require engineering problem-solving. The problem with this is that the engineering business is profit-driven, and cookie-cutter designs are more efficient. Our bureaucracy is geared towards this cookie-cutter system, and it not currently equipped to review a performance-code.
19. Love the Florida model – also look at Seattle – create motivation and incentives for natural function.
20. Need an emphasis on connectivity and consolidation (e.g., Ginny’s Longhorn on Burnet – parking vs. green space, consolidate green space and parking).
21. Improve design guidelines (e.g., more green elements along street corridor – diversify and enrich).
22. Involve landscape architect in subdivision layout – integrate early in development process – better team with more training.
23. Very limited (narrow) ROW to work with – reduce the front yard setback (to 15 ft) and get more room in the ROW for green elements.
24. Seattle sets the building back 5 feet from ROW to allow for more green.
25. Need more incentives – go through the incentive process (e.g., impervious cover bonus).
26. Need a holistic view of the site – more connection to the creek.
27. Allow flexibility with pervious cover to do things a little differently.
28. What’s done at small-scale, site level accumulates to larger level.
29. Like the minimum pervious requirement – add incentives to exceed.
30. Current code implementation needs more coordination.
31. Consider lifespan and maintenance of structural controls when they are designed and constructed (e.g., oversize to account for loss of function over time)—then can afford to lose some capacity.
32. Current code does not measure function of pervious cover – just based on percentage – connected, diversity, amount of trees, health of soil – how that pervious cover is functioning.
33. Challenge of how to make sure green stormwater infrastructure controls are in place and working 10 – 20 years down the road (over build? not inspect?) – paradigm shift from current setup – point of sale inspections have been suggested, but their equivalents are not working well for energy audits.

34. Need more education on form-based zoning – presentation on terms so we’re all on the same page – need a good chunk of time in next meeting to understand what FBC is and is not. [Note: A Form Based Code presentation will be included as part of our March 13 meeting.]
35. Whatever we do, we must discuss how we’re going to pay for it (can have great rules, but they won’t help if not projects are built using them because they are unaffordable).
36. Email out the district profiles to the stakeholder group (see link above).

Comments from breakout groups

What are the strengths and weaknesses of the system Austin is currently using?

What are the strengths and weaknesses of the national models discussed?

Are there additional solutions that should be considered as part of CodeNEXT?

Group 1 (recorder: Staryn Wagner)

Incentives/Rewarding Good Behavior

1. Get connectivity back with green stormwater infrastructure + incentives.
2. Florida model good by rewarding what we want.
3. Need incentives for redevelopment – consider granting additional height to redevelopment projects in exchange for removing impervious cover from along creeks.
4. Need to incentivize green stormwater infrastructure during redevelopment.
5. Provide incentives for trail easements.
6. Incentivize green space on both sides of the sidewalk.
7. Reduction in fee for added green stormwater infrastructure?

Improve design guidelines

8. Adjacent and adjoining green space.
9. 5-10% of impervious dedicated to landscape-related features (e.g., cisterns, greenhouses, etc.)
10. Critical greenspace and green stormwater infrastructure zones could have a higher open space requirement (percentage).
11. Put open space and green stormwater infrastructure for commercial adjacent to residential to act as a buffer.
12. Change commercial design standards to put green and pedestrian space together.
13. Make green stormwater infrastructure connected to the human experience.
14. Make green stormwater infrastructure multifunctional.
15. Landscape architect should be required at design level for certification/points in the Green Building Program.

Miscellaneous

16. Use orange fencing to protect *all areas* not to receive impervious cover.
17. Problem with redevelopment is parking loss; parking sharing could be a potential solution.
18. Transportation issues impact impervious needs.
19. Consider Seattle Green Factor and Washington, DC Green Area Ratio systems.

Group 2 (recorder: Kelly Strickler)

Weaknesses

1. Not performance-based.
2. Too many variances/is too easily circumvented.
3. Not fine-tuned for various ecosystems (e.g., Blackland Prairie).
4. Need to disconnect more impervious cover.
5. Should encourage dedication of public open space *without* payment-in-lieu.

Performance Standard

6. Need something performance-based. These models are advantageous in that they are predictable for developers, but it also has to *work*.
7. A performance-based system allows for flexibility up-front, as long as the end results reach standards.
8. Developers will be against a performance-based standard because it increases risk, but we already have a high risk (natural) system.
9. Need to build in a monitoring system, and make sure to monitor predevelopment conditions as well. But who pays for this monitoring system? How do we ensure funding for the system remains in place?
10. Should add in a predevelopment volume requirement as well as just a peak flow requirement.

Connectivity/Open Space

11. Like the Colorado Model, especially in the suburban watersheds. Trail system should be planned ahead and built along with development. Could easily add in required pervious areas to this model.
12. Should require public open space *and* structural controls.
13. Greenbelts of shortgrass prairie in the east would be great. The location of that shortgrass could be the basis for the dedicated open space (prioritize the preservation of shortgrass prairie).
14. Should be more difficult to access payment-in-lieu (or impossible).

Context Sensitivity

15. Need context-sensitive regulations that mesh well with the CodeNEXT changes coming down the pipe.
16. Still need parkland in centers to mitigate for the higher density.
17. Any national model needs to be tailored to our geology and geography.

Miscellaneous

18. Should have an incentive of some sort to get people to register their voluntary green stormwater controls. It could be a system similar to Green Building, in which the site gets an accreditation and a star level. Get to put a sign in your yard, and be a part of a tour of green stormwater controls.
19. Like the flexibility of weighting different sorts of pervious areas (Florida model).
20. Must integrate with Transportation, Public Works, and any other relevant department. As far as the environment, all departments need to have a single goal.

Group 3 (recorder: Kelly Gagnon)

Weaknesses

1. “Big picture” problems
 - a. Not enough focus on water conservation.
 - b. Rapid growth/densification not met with protections.
 - c. Protection conflicts with tax burden/profit needs.
 - d. Site-specific constraints.
 - e. Process cumbersome, segmented.
 - f. Big question: How do we facilitate what we want? How do we make it a viable option?
2. Construction-phase protections
3. Single-control sites (end-of-pipe)
4. Incentives to “clean-cut” before construction
5. Landscape architect not brought in the beginning of the process for residential (to design roadways, land plan, etc.)
6. Contradictory and overlapping ordinances, constant changes, and inconsistency in application. All these factors lead engineers/designers away from “innovative risks” because it is not worth the time it takes to get them approved. In this climate, it is cheaper and easier to go with end-of-pipe.
7. No incentives to use innovative controls (e.g. permeable pavers)
8. Variance process
 - a. Difficult for reviewers to understand the true impact of the plan in its initial phases.
 - b. Segmented review of interconnected issues.
 - c. Environmental Board reviews *after* the city reviews. It is an elaborate process.

Other national models

9. Need climate-specific considerations to adapt any of these models.
10. Florida strength: Innovative controls are incentives used towards the pervious cover calculation (rain garden, porous pavement, etc.)

Solutions to consider

11. “Credit” system (e.g. tree protection, tax incentive).
12. Trial and error for LID.
13. Use stormwater quantity as a sellable/recyclable resource.
14. Rearrange review (e.g., variance considerations/Boards and Commissions review before site plan review).
15. Connect design/layout of the site to the creek.
16. Landscape architect should be involved in initial land planning. Similar to an architectural planning committee.
17. Focus on conservation in addition to infiltration. Regulations should be regulation-area specific depending on sensitive features.
18. Incentives to treat infill structures built by single-family homeowners (e.g., rainwater harvesting, porous pavement, rain gardens).
 - a. Maintenance considerations/challenges.

- b. Appropriate soil type considerations.

Group 4 (recorder: Ana Gonzalez & Andrea Bates)

General

1. We currently have “given up” downtown. Retrofit and healing is not addressed in the current code. How can it be done?
2. Want to see measurable function from open space. How do you prove it will work?
 - a. Infiltration/compaction
 - b. Connected
 - c. Habitat/diversity
 - d. Urban forest/trees/shade
 - e. Soil/organic content
 - f. Aesthetics (some controversy on the inclusion of this point)
3. Must make performance measures for landscaping/open space. A form-based code just deals with how it will *look*. We need to address function.
4. Open space vs. park space—does it have to be separate?
5. Code should incentivize the protection of areas with high existing function (natural soils & vegetation)
6. We should provide incentives to reduce levels of noncompliance in redevelopment

Site 1: Berdoll Farms response

7. No guarantee that the lawns are pervious
 - a. No confirmation that the pervious area *functional*
 - b. layout is fragmented
 - c. problems with both design and construction
 - d. Ignores potential multifunctionality of open space
8. Developer (subdivision) is held to a certain standard, promising perviousness in a subdivision, but then the builder may have different ideas. Residential permitting after the subdivision has a different review process.
9. Current system does not provide incentives for developers to go above and beyond with beneficial reuse/disconnection and/or nonpotable/gray/rainwater harvesting. Good to have these systems, but it is hard and expensive to do. Requires two plumbing systems, little return on investment. Others are starting to do potable and non-potable systems (Tucson requires single-family and duplex dwellings to include the piping necessary for the installation of a greywater system; e.g., outside stub-out and separate systems for black vs. greywater).
10. In Tucson, it is very easy to get a curb cut from the ROW onto your property to water your yard (water conservation and water quality benefits).
 - a. Streamlined for ease to homeowners
 - b. Helps with design for rain gardens
11. Austin doesn't have to reinvent the wheel here, but national models do have to be modified for our rainfall patterns.

Site 2: S Congress response

12. Problem: Code can't determine the allocation of impervious cover (creek is covered up)
13. The Colorado Model would create a public open space corridor along the creek.

Site 3: Burnet Road response

14. A shared solution would be challenging for such small lots
15. Incentive to remodel rather than prepare site plan