March 13, 2015 Green Infrastructure Working Group Meeting Notes

Integrate Nature into the City

The following largely represents comments that are not reflected in the powerpoint slides—please refer to the presentation as well (*Presentation links: One slide per page. Six slide per page handout).*

General GIWG information

We want to let everyone know that we are planning to hold an additional wrap up meeting on May 15th. This meeting is intended to facilitate the integration of concepts and comments from of all of the Green Infrastructure Working Group topics:

- Land cover and natural function (February 20)
- Integrate nature into the city (March 13)
- Beneficial use of stormwater (April 10)
- Stormwater options for redevelopment and infill (April 24)
- Integration of Green Infrastructure Elements (May 15)

Review of objectives

- Present an introduction to form-based codes, in response to requests for such an introduction in our February 20th meeting.
- Discuss best practices & challenges relating to integrating nature into the city, concentrating on strengths and opportunities for improvements to the Landscape Ordinance.

Introduction to Form-Based Codes (Jorge Rousselin, PDRD)

Presentation Link: Six slides per page handout

Also see a video of a February 23rd City Council CodeNEXT workshop (Item 2, Part 1, starting at 24:55) http://austintx.swagit.com/play/02232015-513

A form-based code is a zoning implementation tool.

- Fosters a high quality public realm by regulating physical form (rather than just land uses)
- Creates a predictable urban form by addressing the relationship between building facades and the public realm, the form and mass of buildings in relation to one another, and the scale and types of streets and blocks
- Codes are not design guidelines; its regulations must be followed

A form-based code is founded on a community vision; the resulting code is a tool to ensure the creation of the building forms and types of places that the community desires.

- Place-specific
- Context sensitive
- Example: 2011 Airport Blvd visioning process and form-based code

Key form-based code elements

- Regulating plan: Specifies the location of character districts (also called transects or zones), which dictate which set of standards applies.
- Public space standards: vary by character zone.
- Building form standards: vary by character zone.
- Administration: Nonconforming uses, non-compliant structures, amendments, etc.
- Other standards: Architectural design, materials, landscaping, streetscaping, signage, transitions.

While a form-based code is predominately used to regulate the physical form of the buildings on a site, it can also include other site standards such as landscaping and transitions between different land uses. Just like the other components of a form-based code, these landscaping and transition standards are **based on a community vision** and are **mandatory**. Form-based codes can not only accommodate landscaping regulations, but they are an opportunity to ensure that new development includes landscaping that is context-sensitive and consistent with our community's values. Our challenge is to collectively develop what that vision is—the form and quantity of landscaping that should be required in different contexts.

Health and community benefits of green infrastructure (Erin Wood, WPD)

Green infrastructure is not just an "extra" environmental and aesthetic amenity—it is essential to creating healthy human habitats. Dr. Frances Kuo, the founder of the University of Illinois Landscape and Human Health Laboratory, recently spoke at the Imagine Austin Speaker Series (Link to video: http://austintx.swagit.com/play/12232014-515) about the health and community benefits of green infrastructure. Her research has demonstrated that the presence or absence of nature has pervasive and large effects on our social, psychological, and physical well-being (see paper link below for more details). Given her research findings, she makes three recommendations for creating healthier human habitats:

1) Provide as much nature as possible—diversity and various scales of green space is key.
2) Bring nature to people—green those places already used by people in their daily routine.
3) Bring people to nature—preserve green spaces and find ways to encourage people to spend significant and frequent amounts of time in them.

In our discussion of the Landscape Ordinance (and the other topics), we will keep these recommendations in mind.

Parks and Other Green Environments: Essential Components of a Healthy Human Habitat
http://www.nrpa.org/uploadedFiles/nrpa.org/Publications_and_Research/Research/Papers/MingKuo-Research-Paper.pdf

The role of the Landscape Ordinance in integrating nature into the city (Erin Wood, WPD and Atha Phillips, PDRD)

The Landscape Ordinance is just one of many City of Austin regulations that promote nature in the city (for a list of a few example regulations, see slide 11). Enacted in 1982, the provision of high quality landscapes that serve multiple functions has been a longstanding community value (see slides 12 and 14 for the 1982 intent language). We would like to propose three new additions to the existing ordinance's stated intentions (Note: intent language will be reintroduced to the code in the CodeNext revision).

1) Stormwater treatment (the 1982 "stormwater runoff retardation" speaks to maintaining natural hydrology/water *quantity*, but not quality)
2) Climate change resiliency and mitigation
3) Water conservation

The current Landscape Ordinance is composed of parking lot design standards (slides 19 – 20), buffering requirements (slide 21), streetyard requirements (slide 22, outlined in red), and limited stormwater infiltration requirements. City tree preservation regulations are not part of the Landscape Ordinance, but the ordinance encourages the preservation of a site's existing trees by counting them towards the site's required trees (slides 16 – 18). These regulations produce landscapes that meet the 1982 ordinance's goals in many situations, but has not been successful in all development contexts.

Analysis of potential improvements to the Landscape Ordinance (Sue Barnett, PDRD)

Environmental Review (PDRD) has been working with landscape architects within the department (as well as others) for the past 2 years to identify the strengths, weaknesses, and potential improvements to the Landscape Ordinance. Since there have been 20 changes over the years, a main driver for this effort is to simply consolidate the different parts of the code to make it more user-friendly. The more content-focused driver is to prepare for CodeNEXT; we want to create an agile ordinance that can easily adapt to the code rewrite, ensuring that existing and essential landscape provisions are not lost in translation. Our main task in creating an agile framework is introducing flexibility to the ordinance so that it can produce desirable landscapes in all contexts.

Pulling from the Community Character Manual created by Opticos, the code will likely contain different requirements for at least three different contexts: Walkable Urban, Transition, and Driveable Suburban (Link to manual: ftp://ftp.ci.austin.tx.us/GIS-Data/planning/CodeNext/Community_Character_Manual/). Slides 26 – 35 describe these contexts and their related landscape challenges. Form-based code elements, discussed earlier, will also likely provide additional detailed contexts.

Main challenges

- Amount of greenery to require in urban contexts
- Need adequate space and soil volume or shade trees
- Need to balance density and green space

While the focus of this meeting is to explore landscape requirements for different urban contexts, our review is also examining: (a) water management, use, and irrigation; (b) shade trees and soil volume; and (c) remodeling

and infill challenges. These issues remain very important, but we will not be discussing them in detail today. Water management, use, and irrigation will be discussed at the next meeting (Beneficial Use of Stormwater, April 10), while redevelopment/infill is a larger discussion that encompasses much more than just landscape requirements (such as stormwater, hence our Stormwater Options for Redevelopment and Infill meeting on April 24th).

Other national models

- Beaufort, South Carolina (Form-based code recently produced by Opticos, incorporating landscaping and stormwater requirements)
- Miami, Florida (Form-based code; ≥ 10-foot setbacks in all transects)
- New Orleans, Louisiana (Depressed parking islands in all parking lots)
- Tucson, Arizona. (Commercial Rainwater Harvesting Ordinance)
- Seattle, Washington & Washington D.C. (Green Factor and Green Area Ratio)

See slides 36 – 44 for more information.

Form-Based Codes Comments and Questions from Stakeholders

1. Concern that landscape elements are very rigidly specified under a form-based code. Keeping the hydrologic integrity of a site should dictate the form of the landscape, not these inflexible patterns. Stormwater management needs its own open space.
2. Agrees with the comment above. Previously, drainage just got what was left on a lot, and the form-based code paradigm seems to just continue this practice.
3. What about flexibility with soil types and variances? It is very important to manage exceptions.
   Staff response: If a site wants to vary from the forms that are allowed on the site, they must obtain a code change (ordinance) to do so. The standard for a code change is much higher than a zoning change or exception, so variances should be less common.
4. How the code is implemented will be the key. How have other cities made sure that environmental provisions work under this paradigm? What must go along with form-based code? Also, what do you think of the idea of needing a supermajority (3/4 vote) to get a code change?
   Staff response: The new code must make the criteria for variances and exceptions clear up-front, before the code is implemented. Ideally, these criteria would be set high, i.e., be difficult to satisfy, leading to fewer variances. And remember, the change to form-based codes happens slowly over time as sites are redeveloped—it is evolutionary, not revolutionary.
5. Are there any examples of best practices for integration of nature into a form-based code?
   Staff response: Beaufort, South Carolina does a good job, and we will be examining them later in the presentation. Locally, Airport Blvd includes a wide range of greenspace types.
6. What about the costs of these new regulations? What are the implications for affordability?
   Staff response: It is intended that Form-based codes are easier to use and implement, which should streamline the development process. While we can't require affordability as a part of the code, we can offer

a wider range of building types as an incentive to include affordable units. In general, affordability is a huge challenge that is facing a lot of cities. We are asking a lot of the code, including a lot of potentially conflicting goals. We need to find the right balance.

Large Group Comments

1. Dr. Kuo says that landscape ¼ mile away is *not close enough.* Landscape needs to be very close—should be included in all types of development.
2. It is very profound to learn about Dr. Kuo's research. It bolsters our case and garners more support for our cause.
3. Kuo's research also shows that there is not as much conflict/competition between affordability and green infrastructure as we may think.
4. Does form-based code have intent language? The intention to improve human health should be highlighted. Staff answer: Yes, it can. One of the few things we are sure about the upcoming code revisions is that it will reintroduce intent language to the code.
5. Connection between trees and air quality. Shaded cars take a shorter amount of time to cool down, saving gas.
6. Root barriers are not always required, but they are frequently used with utilities. This is an example of competing priorities—things are quite complex in the right-of-way.
7. Root barriers may be redundant given the soil compaction in some areas.
8. What about selecting right-of-way species based on their rooting pattern and the utility situation (e.g. taproots vs. laterally spreading roots). We can also use more advanced technology such as porous/pervious pavement, grated pavers, and structural soils.
9. Concern that a continuous trough may reduce the room available for pedestrians on the sidewalk—conflicting needs of trees and pedestrians.
10. In any consideration of Green Area Ratio or Green Factor, we need to remember that Seattle and Washington D.C. have a very different rain regime than we do.
11. Need trees to make urban areas walkable – use modern techniques for adequate root space – other options for vines, green walls, planters, and other ways to add green.
12. Incorporate best practices for modern urban tree planting.
13. Need to include maintenance considerations.
14. Can use setbacks for more vegetation, bioretention – integrate in transition.
15. In suburban areas, use green space for more public use and connectivity – creek corridors for pedestrians, water quality, detention.
16. More performance based, decentralized system – water distributed and used for recreation (e.g., green corridors).
17. Off-site areas vs. on-site should not be either/or – should have a green network connecting various green spaces – focus on ecosystem services, functions, and pedestrian use.
18. Redevelopment should have a trigger (kind of like accessibility) to add green, even for remodels.
19. Would like to see the landscape ordinance be more cohesive toward serving ecosystem services, performance based, usable green space – consolidate into human use and ecosystem services.

20. Change the way that site plans are put together – need a site analysis sheet that speaks to existing landscape character and what needs to be preserved – consultants used to review preliminary site plan/concept as a team at DAC and look at what's possible – everyone should be at the table at the concept phase, bring site analysis, and make sure the whole character isn't lost by development (existing landscape, hydrology).
21. Walkable urban – more rainwater capture (30% alternative source for irrigation in Sunset Valley) – species selection, soil volume, soil mix type needs to be brought to forefront.
22. Support for flexibility, menu-based approach (e.g. Green Factor).
23. Sunset Valley – protect 10" caliper and above, 5" for small trees – look to surrounding jurisdictions for guidance.
24. Leander – 30/70 ratio of compost to topsoil.
25. At initial meeting with developers/consultants, provide education about local habitat and wildlife.
26. Suburban – limit turf, more shade in parking lots, more dedicated open space at ground level, wildlife corridors (behind private lots – need to map).
27. Landscaping just in ROW? Off-site only? Answer is no.
28. Require a percent open space and require to be pervious.
29. Required landscape setback (Subchapter E) – avoid utility conflicts – Seattle requires setback from property line for green (benefit of green on both sides) – still need to determine appropriate width.
30. Code should be less prescriptive and more performance-based – don't need variance every time you want to go a little out of the box.
31. In urban environments, look at landscaping and benefits per area – different parts of the city/urban environment that allow for different functions/designs (urban contexts).
32. Deciduous trees – effect on urban heat island, shade.
33. Suburban – incentivize wildlife habitat (NWF certification), minimize turf.
34. ROW only? Offsite only? No – not sufficient.
35. Integration of the corridors for human and wildlife connectivity.
36. Utility tree trimming – give tree trimmers the right to take out invasive species in ROW.
37. Not just street trees that provide habitat – other landscape features and plants that can work.
38. Function vs psychological effects – some places you can only put a small amount of green – when feasible, larger amount, trees, etc. – tailor to context.
39. Using creeks for connectivity – be good stewards because we are sharing with wildlife – allow spacing/buffers and leave some corridors just for wildlife – extend connections for wildlife beyond preserves – feed into greenbelts and larger areas.
40. Urban environment – design all urban landscapes based on biofiltration/hydrologic function and everything else will follow (will have more nature, wildlife habitat, etc.).
41. Stop requiring street trees everywhere – build development offset to allow more space for shade trees on one side and then could use vines on the other side (based on solar orientation).
42. Grow Green should start grouping plants into guilds/ecotypes.
43. Talk about quality – not just quantity of plantings.
44. When we have too much impervious cover, mitigate with green roofs and parks/green spaces within walking distance.
45. City of Austin website – rain garden plant list should be updated.

46. How do you maintain green infrastructure and keep it going? Do companies know how to maintain green stormwater infrastructure, etc.? Need certification program/more education – shouldn't be afraid of current lack of knowledge, can address through training.
47. How can we concentrate vegetation – indices of biomass accumulation/density – Sustainable Sites Initiative.
48. If Tucson can do 50% rainwater irrigation, there's no reason we can't do 100% between rainwater, condensate, etc. – take off the potable system (percent debatable - as high as we can get?).
49. More coordination with Austin Water – work-throughs with TCEQ.
50. If you densify, what else goes but the green space? Concerned about goal of preserving environment as population/density increases – Need to establish intent and add value to things we want to preserve.
51. Walkable urban – losing valuable canopy one lot at a time.
52. Bring environmental cost into development equation – add value to features we are trying to protect.
53. Protect our waterways and restore ecological function – development footprint has a direct impact on stream health (e.g., Shoal Creek) – Goal of future development should be to undo/correct watershed problems – impervious cover mitigation – reduce the volume of runoff site-by-site – simulate predevelopment hydrology.
54. Don't want to lose the work we did on the Watershed Protection Ordinance.

Comments from Breakout Groups

How do we integrate nature into the Walkable Urban and Transition contexts?

Are improvements needed in the Driveable Suburban contexts?

Discuss: Public vs. private provision of green areas.

- *In denser areas, is it acceptable to have landscaping only in the right-of-way?*
- *What if green areas are provided off-site? (e.g. open space at Mueller)*

Group 1 comments

General

1. Need a performance-based system and a decentralized stormwater system, but who does the math? How do we know that it is working, and will keep working?
2. Likes Green Area Ratio (GAR).
3. Perhaps implement a system in which you have a variety of green stormwater infrastructure options based on site soils, slope, and location [like a GAR for stormwater, essentially].
4. Potential conflict between regional solutions and decentralized paradigm.
5. Question: Can FBC address decentralized solutions?
6. The Tucson rainwater harvesting ordinance could have the unintended consequences of producing extremely xeriscaped landscapes (so that it needs very little water) in order to enable the use of a smaller/cheaper rainwater harvesting system. While this may meet our water conservation goals, we still want some green. Would have to make sure that was discouraged.

7. Another possible water conservation solution. A site is only allocated a certain amount of potable water (water budget) for irrigation purposes. If they want to use any more, it must be supplied with rainwater harvesting.
8. Need incentives for advanced irrigation techniques.
9. We should change the trigger for redevelopment vs. remodel.
    a. Something similar to accessibility, i.e. must add a perimeter buffer if the site changes exceed a certain square footage.
    b. Could use the ratio of new building area to untouched building area.
    c. Could just have to add a canopy to help with shade instead of expensive landscaping.
    d. Could be a weighted trigger, so that required landscape is proportional the extent of redevelopment. For example, if a site remodels 10 – 20% of the site, they need to complete X requirements. If they remodel 30 – 50%, Y requirements, etc.

Trees and shade in urban and transition contexts

10. In a lot of contexts we don't need to optimize trees, but instead understand that they may not reach full maturity. We can include them in a context-sensitive way—perhaps selecting trees that look okay "stunted".
11. Disagrees with the above comment. What about shade? Will those "stunted" trees still provide enough shade? Maybe we can reduce the space between the trees to compensate for their smaller adult size.
12. This doesn't have to be an either/or—we can have landscape *and* paved areas. The tree canopy makes it walkable, so it shouldn't be sacrificed. There are ways to make sure that trees have enough soil. Belts instead of boxes, structural soils, etc.
13. Agree with above comment. There are many products, and the second-generation products are getting much better. A second-generation product allows for a 6 -8 in utility line.
14. In areas where trees are infeasible, what about green walls or lattices instead? Vines have shallow roots, but they can grow on a structure to provide shade.
15. Perhaps shade is actually most important in transition areas, not urban. Highly urban areas get shade from buildings and awnings. [Facilitator's note: in fact, it can be difficult to get plants to grow in areas that are shaded by buildings.]
16. Maybe shade should not be the exclusive goal, then. Also must consider other benefits.
17. People don't walk without shade though.
18. What about tall grasses in really urban areas—planters punched into the pavement.
19. Tree root concerns. Potential to grow into power lines and push up pavement, generally tearing up infrastructure.
    - Vines and arbors could be used in tight areas.
    - Structural soils are an option.
20. Maintenance is a cost that rarely gets considered. How much it is it to maintain these new pavement systems?

Transition Zones

21. More room between buildings and curb for landscape.

22. Right-of-way and then a 10-15 ft setback would be good.
23. Bioretention in parking lots.
24. Need combination of rain gardens *and* trees. Arbors and rain gardens are a great idea, but we still need trees.

Driveable Suburban

25. In all contexts, we need more connectivity. Cesar Chavez and Nueces is a good example of expanding connectivity.
26. There will be some neighborhood pushback against connectivity. We can enhance connectivity without encouraging cut-throughs by making connections for bikes/pedestrians, but not cars.
27. Or we can use creek corridors for bike/pedestrian connectivity (plus stormwater and flood uses). Connects water as well as people.
28. Need more open space for recreational uses.
29. Need more sidewalks and pedestrian and bike corridors.
30. Offsite green space should not preclude onsite. Mueller still has green all over the neighborhood and onsite, not just in the parks.
31. Concern for the public provision of greenspace. What about newly annexed areas? It will take a long time to extend green space "services" there, and in the meantime they are still paying taxes for those amenities.
32. Need larger offsite areas and then smaller green connections between these larger spaces. Maybe less requirements on an individual lot, but those green connections must be there to provide green space near residents.

Group 2

General

1. Greenfield projects should include a landscape architect in the initial site assessment of existing conditions. Preserve character of the site. Integrated design that incorporates all the engineers as well.
2. Pay attention to microclimates and plant guilds—different parts of the city have different landscape benefits
3. Need certification system for contractors
4. Rational site design based on:
    a. Natural light
    b. Hydrology
    c. Soil
    d. Existing trees/vegetation
    e. Water/energy budget that uses existing site conditions

5. Flexibility—not a prescriptive code; menu-based design and performance-based design
    a. Performance criteria must be clearly defined
    b. Add requirements for long-range functioning

Integrating nature into the Walkable Urban and Transition contexts

6. Rainwater harvesting
7. Sunset valley –30% alternative source
8. More open space
9. Species selection on tap roots/trees that do better under stress
10. Plants with vertical structures—not necessarily trees, but still provide shade
11. Structural soils/porous surfaces
12. Raised planters
13. Incentivize green roofs and green walls
14. Focus on soils, not just vegetation. Soils important—maximize mix, soil depth, and soil health. Use soil probes
15. Need to consider remediation of areas to rehabilitate function

Right-of-Way

16. Boulevards, green in roadways, pedestrian stop points (multifunctional)
17. Tree preservation—should reduce the heritage tree size
18. Make contiguous planting areas rather than planting in cells
19. Provide walkable/shaded corridors
20. Consider conflicts that utilities and easements represent for green infrastructure

Driveable Suburban

21. Emphasize walkable/bikeable paths and enhance alternative transportation corridors with green components
22. More dedicated open space and establish rules for required open space in residential subdivisions. Add green space requirements to subdivision requirements.
23. Turf limits
24. Soil volume
25. Maximize decentralized waste water system and stormwater
26. Multifunctional open/green space (stormwater, shade, recreational)
27. Be creative to integrate public use/access while also protecting soils from compaction
28. Incentivize subdivisions to create certified wildlife habitat. Not just street tree—need habitat as well.
29. Wildlife corridors
    a. Define where suitable
    b. Require preservation

Public vs. Private provision of green spaces

30. Must enhance connectivity
31. Acceptable to have landscape only in the right-of-way? NO
32. Offsite greenspace only? NO

33. Open space requirements—should be changed so that open space must be pervious and at ground level.

Group 3

1. If you densify, what else goes but the greenspace?
    a. Afraid street trees will be all we get
    b. Stormwater and landscape must be an up-front consideration
2. Developer will always choose cheapest option. Each site must have sufficient water quality and landscape/green space.
3. Worry about businesses encroaching into single-family residential.
4. How does GIWG come together with all the other work groups?
5. Make green infrastructure a part of base-zoning so sites cannot opt out.
    a. Assign real cost to existing environmental features, and prioritize those features. Existing features have highest value ($$), and then look at it from an impact perspective.
6. Analyze impact of new zoning on flooding/water quality. Think about watersheds.
7. Density does not necessarily mean more affordability (different markets). Density also does not necessarily produce less sprawl or less greenhouse gases.
8. Sustainable sites initiative.
9. Incentives should not trade off other community values (e.g., height).
10. Need conversation about historic landscaping (e.g., Hyde Park)
11. Incentivize removal of impervious cover.
12. Predictability—can't just get a waiver/variance:
    a. Make it non-negotiable
    b. No shell game of providing green space offsite
    c. Supermajority for changes
13. Make clear intent—development won't regulate itself.
14. What is a sustainable population for the watershed?
15. California model—have to identify long-term source of water.
16. Keep greenspace we have and do not lose any more.
17. Undisturbed pervious areas should be required.

Group 4

18. Design all land use for biofiltration and everything else follows
19. Maintain hydrologic function and the function will follow.

20. Get away from just street trees. E.g., could do vertical trellis of vines (smaller footprint). Possibly less water used for the same vertical height.
21. Need quality, not just quantity of landscape. Need green metrics to measure function (e.g., biomass density)
22. Different plant lists for different conditions (e.g., site is west or south facing).
23. Maintain character. Not just a static planting bed—should change with seasons. This would require more maintenance, but also would enhance unique character.
24. Move to an expert system rather than a prescriptive system. Focus on function.
25. New maintenance skill set is needed, but we shouldn't allow this new challenge to put people off. It is a necessary next step.
26. Mueller model—it is okay to concentrate all the biomass in one place offsite as long as there is a minimum amount of green within close proximity to residents.
27. Green roofs—should be okay to use them to satisfy requirements.
28. Sustainable sites—has both baseline requirements and extra elements to obtain a higher score /performance [Austin Energy Green Building is also this way]. Incentivize?
29. Make sure to have a park in walking distance of all new development.