

# Green Infrastructure Working Group (GIWG) Summary

*The key topics and potential solutions presented below were derived from staff benchmarking of national models, public input received throughout the six GIWG meetings, emails and comments received outside of the meetings, and through write-in solutions during a voting exercise at the “Integration of Topics” meeting. This document is intended to summarize the large quantity of input received from stakeholders and distill that input into potential action items. All individual stakeholder comments are valued and documented, however. Detailed notes of stakeholder comments during each of the six meetings can be found on the GIWG website (<https://austintexas.gov/page/green-infrastructure-working-group>).*

*During the “Integration of Topics” meeting, both stakeholder and City of Austin staff from various departments participated in a voting exercise. Participants were given two dots to place on their top priority themes and four dots to place on their favorite solutions. It is important to note that the voting results for the key themes and potential solutions below will not be the sole deciding factor for any policy decisions going forward. Staff wanted to generally gauge stakeholder priorities and ensure that no major items had been overlooked. Solutions will not be eliminated based on the exercise results, nor will staff necessarily move forward with suggestions because they received a large portion of the votes. Furthermore, the key topics and potential solutions presented are not either-or options—the use of one solution does not preclude the use of another. Watershed Protection and City of Austin staff will need to internally test potential code using both stakeholder and staff input, and then will make a recommendation to the consultant team.*

## **Ten Key Priorities (in order of total votes):**

1. Onsite infiltration/retention of stormwater
2. Integration of green elements into all contexts
3. Re-use/conservation of stormwater
4. Functional pervious areas
5. Redevelopment should be required to mitigate its share of downstream flooding
6. Adequate provisions for trees
7. Publicly-accessible open space
8. Special considerations for redevelopment for onsite infiltration/retention requirements
9. Adequacy of infrastructure capacity used to guide land-use planning and redevelopment
10. Green elements in both right-of-way and site setbacks

## Land Cover & Natural Function

Why it is important:

Level of imperviousness on a site or watershed is the main driver for health and safety issues relating to flood, erosion, and water quality. As impervious cover increases in a watershed, the percentage of rainfall converted to runoff also increases. This process deprives creeks of baseflow that sustains them during dry periods, while the increase in runoff contributes to channel erosion and flooding. While WPD’s primary strategy up to this point has been to establish impervious cover limits for sites, it is also essential to ensure that pervious cover on sites is functioning correctly. For this reason, it is important to supplement our impervious cover regulations with measures to protect and restore pervious areas with well-functioning soils and vegetation. The following topics represent two potential opportunities to increase a site’s natural function.

### *Key Topic 1: Functional pervious areas*

*Total votes = 13 (10 stakeholder, 3 staff)*

As levels of impervious cover continue to increase as Austin urbanizes, it is becoming more and more difficult to protect the natural function of existing pervious areas. The current regulations simply limit the level of impervious cover—they do not prevent the fragmentation of pervious areas and soil compaction that is common on highly impervious sites. Furthermore, current regulations do not protect pervious areas from being degraded during and post-construction. The following solutions aim to promote adequate natural function for all sites by preserving natural pervious areas on greenfield sites (raw land) and restoring pervious function on redevelopment sites.

Potential Solutions	Stakeholder votes	Staff Votes	Total votes
<p>a. Institute a flexible and incentive-based system similar to the Florida model</p> <p><i>The Florida model requires a minimum of 30% pervious area on a site. This percentage can be reached with various types of pervious surfaces, with different weights given to surfaces according to their relative functional value. (These are just illustrative example percentages--they could be modified to reflect Austin-specific priorities)</i></p> <p><i>Planted areas/existing trees = 100%</i>  <i>Stormwater ponds = 50%</i>  <i>Green roof = 200%</i>  <i>Porous pavement = 50%</i></p>	4	0	4

<p>b. Institute an effective impervious cover limit system similar to the New Hampshire model</p> <p><i>The New Hampshire model sets impervious limits based on amount of effective impervious cover. Site must demonstrate that impervious cover over the limit does not contribute directly to stormwater runoff leaving the site.</i></p>	1	1	2
<p>c. Use metrics to ensure function of pervious areas</p> <p><i>Potential metrics include infiltration/compaction, soil organic content, and contiguous area.</i></p>	5	3	8
<p>d. Allow for flexible site designs to enable the preservation of larger areas of contiguous pervious cover</p> <p><i>For example, allow for buildings to be placed non-perpendicular to the street or relax front, side, and rear yard setbacks under certain conditions (e.g. presence of Heritage Trees). Consider requiring the submittal of a conceptual site plan.</i></p>	4	0	4

**Key Topic 2: Publicly-accessible open space**

Total votes = 6 (5 stakeholder, 1 staff)

Given the high cost of urban land in the Austin area, the functionality that we require of green spaces should not be limited to protecting pervious areas—green spaces serve multiple public purposes. The following solutions aim to create contiguous areas of pervious cover that also enhance connectivity between sites and serve as desirable public and private open spaces.

Relevant code sections:

Chapter 25-1-602 through 25-1-606: *A subdivision or site plan must dedicate suitable land for park and recreational purposes (5 acres for every 1,000 residents)*

Chapter 25-2, Subchapter E, Section 2.7: *All site plans two acres in size or larger, and all multifamily and condominium uses with at least 10 units shall devote a minimum of 5% of the gross site area to private common open space or pedestrian amenities.*

Potential Solutions	Stakeholder votes	Staff votes	Total votes
<p>a. Colorado model of required common open space &amp; connectivity</p> <p><i>The Colorado model requires dedication of common open space based on proposed density, lot sizes, and natural characteristics of the site. If possible given site constraints, the intention is to achieve a minimum of 20% of the total development parcel as open space. The location of the area of dedication is guided by the Open Space, Trails, and Greenways Master Plan, and the site has the option to provide public access where key connections exist.</i></p>	2	3	5
<p>b. Provide parkland dedication onsite wherever possible</p> <p><i>Parkland payment-in-lieu offsite would be used as last resort.</i></p>	2	2	4
<p>c. Large percentage of required open space should be pervious (vs. hardscaped)</p> <p><i>Would apply to both public and private open space. Exact requirements would vary based on the area's size and intended use. A potential model is Miami, Florida, which has both open space and green space requirements. Green space is defined as an open space outdoors, at grade, unroofed, landscaped, and free of impervious surfaces. Green space requirements vary by transect.</i></p>	9	2	11
<p>d. Use public open space buffers to provide connectivity and compatibility between differing land uses</p>	4	0	4
<p>e. Write-in</p>			
<p>Some percentage of private open space should always be required onsite. Maintain or increase the current 5% private open space requirement.</p> <p><i>Consider extending private open space requirements to smaller parcels (i.e. less than 2 acres) to ensure sufficient open space in transitional areas between urban and suburban contexts.</i></p>	3	0	3

## Integrate Nature into the City/Integrate the City into Nature

Why it is important:

Imagine Austin conceptualizes green infrastructure as a diverse network of natural landscapes, including parks, the urban forest, trails, greenways, stream corridors, stormwater features, gardens, urban agriculture, open spaces, and wildlife habitat. Thus, 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, spoke at the Imagine Austin Speaker Series ([link](#)) 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 human social, psychological, and physical well-being. 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.

The original intent language of the 1982 Landscape Ordinance ([link](#)) spoke to these public health goals, while also recognizing that high quality landscapes provide multiple other benefits:

- Air quality protection
- Natural hydrology maintenance
- Noise abatement
- Glare abatement
- Urban Heat Island mitigation
- Native vegetation protection
- Visual buffering
- Beautification
- Property value enhancement
- Unique identity of Austin
- Energy conservation
- Protection of health, safety, and general welfare

The following topics represent three potential opportunities to accomplish these goals.

### ***Key Topic 3: Integration of green elements into all contexts***

*Total votes = 15 (12 stakeholder, 3 staff)*

Environmental Review (Development Services Department) has been working to identify the strengths, weaknesses, and potential improvements to the Landscape Ordinance to prepare for CodeNEXT. A key finding has been that the current ordinance is well-suited for greenfield development in suburban contexts, but it has not been providing adequate green space for redevelopment projects in highly urban environments. Going forward, we must create an agile framework that has the flexibility to produce desirable landscapes in all contexts. The following solutions aim to provide as much nature as possible at a variety of scales.

Relevant code sections:

Chapter 25-2, Subchapter C, Article 9: *Landscaping*

Chapter 25-2, Subchapter C, Article 10: *Compatibility Standards*

Potential Solutions	Stakeholder votes	Staff votes	Total votes
<p>a. All sites should have some form/percentage of onsite green elements</p> <p><i>This option would require the creation and calibration of a context-sensitive code that works for walkable urban, transitional, and drivable suburban contexts.</i></p>	5	1	6
<p>b. Use flexible, menu-based approach per Green Area Ratio &amp; Green Factor</p> <p><i>Both the Seattle Green Factor and Washington D.C. Green Area Ratio systems set a minimum green ratio according to zone. A menu of desired landscaping elements assigns weights based on the element's relative value (e.g. stormwater controls are more heavily weighted than turf). Thus, dense sites can meet their requirements within a small footprint by selecting elements with a higher weight. A site calculates its Green Factor/Ratio by multiplying the square footage of each element included on the site by its weighted ratio, and then dividing the product by the site area. Such a system can be used across all zones, or only in certain areas.</i></p>	8	4	12
<p>c. Use landscaped transitions between differing land uses to address compatibility; similar to Beaufort South Carolina model or ASLA-Central Texas proposal (<a href="#">link to ASLA proposal</a>).</p> <p><i>Beaufort, SC requires different types of buffers in terms of function, opacity, width, and plantings according to the two abutting land uses (<a href="#">see Division 5.8 of the Beaufort Community Development Code</a>). The ASLA-CTX proposal provides more green infrastructure elements in 25' wide Compatibility Setback.</i></p>	8	0	8
<p>d. Require landscaping for remodels</p> <p><i>Currently, sites that require a site plan must comply with the Landscape Ordinance (new development and redevelopment). Sites that just remodel the existing building footprint, however, are not required to retrofit landscaping onto their site. Consider some minimum amount of required landscaping for remodel sites.</i></p>	4	0	4

e. Write-in			
<p>Replace the word “landscaping” with green areas, green elements or another term that is more all-encompassing</p> <p><i>“Landscaping” implies the new installation of purely aesthetic green elements. “Green areas” or something similar expands the definition to existing natural areas and functional landscapes.</i></p>	3	0	3
<p>If street yard cannot accommodate trees, allow green roofs, vertical trellises, awnings to substitute</p> <p><i>The provision of adequate shade is essential to creating a walkable urban environment—trees may not be suitable in areas where they cannot grow to sufficient size to provide shade.</i></p>	5	0	5
<p>Allow and encourage urban agriculture in both front and back yards.</p> <p><i>Currently, deed restrictions or homeowners associations can disallow front yard gardens.</i></p>	0	0	0

**Key Topic 4: Green elements in both right-of-way and site setbacks**

Total votes = 2 (2 stakeholder)

Many form-based codes that this group has examined include building frontage types where the only greenery is located within the public right-of-way. Given Austin’s climate and the predominance of new development types with smaller building setbacks, stakeholders strongly asserted that green space could not be solely provided in the right-of-way. The following solutions aim to ensure that greenery on the public and private side of the property line work together to form a cohesive and functional green space.

Relevant code sections:

Chapter 25-2, Subchapter E, Section 2.2: *Relationship of buildings to streets and walkways*

Chapter 25-2, Subchapter E, Section 2.3: *Connectivity between sites*

Great Streets Master Plan

Potential Solutions	Stakeholder votes	Staff votes	Total votes
<p>a. Provide/protect more trees for walkable, shaded corridors</p> <p><i>The protection of existing mature trees within a certain distance of the right-of-way should be incentivized over planting new street trees. In the absence of mature trees, ensure street trees are provided with sufficient soil volume to reach their full size and longevity.</i></p>	4	0	4
<p>b. Require porous pavement, structural soils, grated pavers, continuous planting beds, etc. for street trees.</p> <p><i>This provision could potentially be extended to all trees located within a certain distance of any sort of pavement, even if it is not located in the right-of-way (e.g. parking lot trees).</i></p>	4	2	6
<p>c. Ensure building setbacks enable landscapes on both sides of sidewalk</p> <p><i>This option would most likely necessitate changes to Subchapter E, which encourages buildings to be brought up to the lot line. While Subchapter E currently allows for a supplemental setback of 20 - 30 ft from the lot line, it is not required. Consider requiring a minimum setback similar to Miami, Florida. Miami requires a minimum setback of 10 - 20 ft for all development, including highly urban transects. Depending on the transect, these setbacks must include some portion of pervious green space, pervious area, and/or landscaping.</i></p>	0	0	0
c. Write-in			
<p>Trellises over roadways with vining plants.</p> <p><i>Potentially include freeways.</i></p>	0	0	0
<p>Require street trees in all right-of-way applications, not just core transit corridors.</p>	0	0	0

**Key Topic 5: Adequate provisions for trees**

Total votes = 11 (9 stakeholder, 2 staff)

As Austin rapidly replaces open land and vegetation with buildings, roads, and parking lots, these impervious surfaces absorb and retain far more heat. Elevated surface temperatures increase energy consumption, the rate of ground-level ozone formation, and the temperature of stormwater runoff that enters our creeks. As Austin densifies, this urban heat island effect will only intensify and potentially endanger the health and safety of Austin residents. Higher temperatures and their associated air



pollution can also cause respiratory difficulties, heat exhaustion, heat stroke, and even heat-related deaths. In Central Texas, it is essential to shade surfaces to combat the urban heat island effect. Tree canopy currently covers approximately 38% of Austin’s land area (2010 estimate), but this metric has been consistently declining since the 1970s. The following solutions aim to preserve our existing urban forest and ensure that newly planted shade trees can grow into healthy, mature trees.

Relevant code sections:

Chapter 25-2, Subchapter C, Article 9: *Landscaping*

Chapter 25-8, Subchapter B, Article 1: *Tree and natural area protection*

Potential Solutions	Stakeholder votes	Staff votes	Total votes
<p>a. Protect mature understory trees with smaller calipers and multiple trunks</p> <p><i>Establish a new size of protected ‘understory’ trees that have a caliper size of 4” or more. For example, Mexican buckeye, Texas redbud, and Texas mountain laurel species.</i></p>	3	0	3
<p>b. Institute soil volume requirements to ensure that newly planted trees have sufficient space to reach their full size and longevity</p> <p><i>Adequate soil space provides trees the nutrients, water, air, and root space they need to thrive. Potential national models include Washington D.C., which requires 600 ft<sup>3</sup>, 1,000 ft<sup>3</sup>, and 1,500 ft<sup>3</sup> of soil volume for small, medium, and large trees, respectively.</i></p>	0	0	0
c. Write-in			
<p>Design criteria to protect tree function (e.g. shade)</p> <p><i>Existing mature trees provide more ecosystem benefits than newly planted trees, which may take 30 years to reach maturity.</i></p>	3	0	3
<p>Retain existing tree protection</p> <p><i>Imagine Austin strongly supports the maintenance and expansion of Austin’s urban forest (see actions LUT A11, LUT A20, LUT A32, CE A15, CE A20, CE A21, CE A22, CFS A5, CFS A7, CFS A8, CFS A23, CFS A35). Despite this widespread community support, the Tree Protection Ordinance has faced intense pressure in the past. Stakeholders who chose this option do not support compromising on tree protection standards.</i></p>	4	0	4
<p>Do not plant trees larger than 2” because larger trees go into shock and grow slowly</p>	0	0	0

<p>Do not plant trees in above-grade planters</p> <p><i>If trees must be planted in above-grade planters due to site constraints, consider a provision that does not count above-ground trees towards mitigation.</i></p>	1	0	0
<p>Plant species in appropriate locations</p> <p><i>For example, do not plant bottomland trees such as pecans and sycamore in streets.</i></p>	0	0	0
<p>Integrate “working tree” concepts into code</p> <p><i>“Working trees” are trees that are purposefully selected and placed in specific locations to provide specific services. Examples include trees that work as windbreaks, shading elements, visual screens, riparian buffers, wildlife habitat, and stream stabilizers.</i></p>	4	0	4
<p>Preserve existing natural assets onsite</p> <p><i>Use existing natural assets, including trees, as a starting point for site design. This will enhance both the functionality and uniqueness of each site. Include landscape architects early in the site design process.</i></p>	1	0	1
<p>Plant trees at 30 feet on-center in parking lot medians to provide a continuous tree canopy.</p> <p><i>Current code for large parking lots requires a tree within 25 ft of each parking space adjacent to a median, which equates to 50 ft spacing between trees.</i></p>	0	0	0
<p>Change the caliper size of protected trees to 8” or more.</p> <p><i>Protected trees are currently defined as trees with a diameter of 19 inches or more.</i></p>	0	0	0
<p>Extend site plan tree protections into the new transition zones between neighborhoods and centers/corridors.</p> <p><i>If the development will remove a tree eight inches or larger in diameter, the City may require mitigation, including the planting of replacement trees.</i></p>	0	0	0

## Beneficial Use of Stormwater

As Central Texas faces increases in temperatures, drought, population, and urbanization, we are also seeing decreases in rainfall, surface and groundwater, and natural land cover. In response to these trends, Watershed Protection Ordinance (WPO) Phase 2 stakeholders concluded that new and redevelopment sites should be required to retain and beneficially use stormwater onsite. Current code requires stormwater to be captured and treated, but that water is typically released after 48 hours and sent downstream. Although these provisions do a good job of cleaning up polluted runoff, they do not significantly address other important goals of enhancing creek baseflow and promoting water conservation. Such a provision would ask that stormwater be infiltrated, retained, or otherwise re-used onsite to support vegetation, contribute to creek baseflow, and reduce potable water consumption. This could be accomplished through the use of green stormwater infrastructure practices such as rain gardens, porous pavement, rainwater harvesting, green or blue roofs, and disconnected downspouts. Note that the focus of our current water quality requirements—as well as any future provisions for beneficial use of stormwater—is on smaller storms (< 2 inches of rain). Mitigation of larger storms is handled through flood detention requirements (discussed in more detail below). After the WPO Phase 2 stakeholder process, a subsequent staff review of potential regulatory models identified the following two broad beneficial use opportunities for new development, while the third topic considers how onsite infiltration/retention requirements could be modified for redevelopment projects and other unique site conditions.

### *Key Topic 6: Onsite infiltration/retention of stormwater*

*Total votes = 18 (15 stakeholder, 3 staff)*

Two basic models emerged from staff review of the 18 states and jurisdictions that require onsite beneficial use of stormwater. One model focuses on enhancing infiltration and baseflow, while a second model focuses on simply retaining stormwater onsite. Given the current drought, the findings of the Water Resource Planning Task Force, and WPO Phase 2 support for the capture, storage, and treatment of rainwater, staff proposed to focus on the latter approach of keeping stormwater on-site for any sort of beneficial use. Rather than concentrating solely on infiltration and baseflow, sites could instead use a combination of infiltration, harvesting, re-use, evaporation, and/or evapotranspiration to more flexibly reduce their effective impervious cover. The following solutions represent several regulatory paths to accomplish onsite infiltration/retention goals.

Relevant code section:

Chapter 25-8, Article 6: *Water quality controls required*

Potential Solutions	Stakeholder votes	Staff votes	Total votes
<p>a. Require onsite infiltration and/or beneficial re-use per other US models</p> <p><i>Some national models (MA, MD, CT, NJ, WI, VT) require a portion of water quality volume to be infiltrated onsite. The infiltration amount, usually 7% - 40% of the water quality volume, is based on Hydrologic Soil Group. Other national models (NY, WV, DE, TN, KY, MN, MO, NM, CA) require sites to retain a certain amount of stormwater onsite using a combination infiltration, harvesting, re-use, evaporation, and/or evapotranspiration. Typical retention requirements range from the 80th percentile to 95th percentile storm event; other jurisdictions require the retention of the full water quality volume. Unlike infiltration-based models, retained stormwater can be utilized for multiple purposes onsite.</i></p>	13	5	18
<p>b. Require portion of water quality volume to be treated using green stormwater controls</p> <p><i>This option is similar to the current Transit Oriented Development requirements, which require that 75% of the water quality volume be treated using green stormwater controls. The remaining 25% can be treated conventionally or satisfied through payment-in-lieu of providing onsite controls.</i></p>	4	1	5
<p>c. Require best practices such as downspout disconnection and recessed landscape islands (NOLA model)</p> <p><i>The New Orleans model requires that all sites utilize certain best practices in addition to any applicable stormwater performance standard. For example, all parking lot islands or landscaped areas within parking lots must be designed to allow the flow and access of stormwater.</i></p>	1	0	1
<p>d. Maintain/restore predevelopment hydrology</p> <p><i>Under such a performance standard, all sites would be required to maintain a Runoff Curve Number equal to the predevelopment conditions of the site. Sites would be given the flexibility to reach predevelopment runoff rates and volumes through any means they choose.</i></p>	6	3	9
e. Write-in			
Integrate green area (or landscape) requirements with stormwater beneficial use	4	0	4

**Key Topic 7: Re-use/conservation of stormwater**

Total votes = 13 (10 stakeholder, 3 staff)

Beneficial use of stormwater by infiltrating or capturing rainwater to otherwise use onsite supports Imagine Austin’s water conservation goals. By incentivizing the substitution of stormwater for potable water for outdoor irrigation, toilet flushing, etc., we can reduce a site’s potable water demand. Many stakeholders stated that the amount of potable water needed to irrigate landscaping should drive the amount of stormwater required to be retained onsite. During the beneficial use of stormwater meeting, many stakeholders also expressed a desire to more proactively limit potable water use. The following solutions aim to accomplish this goal. It is important to note that many of the following options (e.g., potable water budget) would require extensive collaboration and feasibility testing with the Austin Water Utility and would modify chapters of the City Code outside the scope of CodeNEXT.

Relevant code sections:

Chapter 6-4, Article 2: *Water Use Management (water waste prohibited, conservation guidelines)*

Chapter 25-2-1008: *Irrigation requirements*

Potential Solutions	Stakeholder votes	Staff votes	Total votes
<p>a. Work towards goal of reducing potable water use for irrigation</p> <p><i>This option would progressively ratchet down incentivized and required practices to allow irrigation, landscape, and development industries to adapt. For example, start with incentivizing a desired practice such as separate irrigation metering, and then eventually make it a requirement. A backup irrigation method would still be required in order to sustain vegetation during extended drought.</i></p>	10	4	14
<p>b. Require high percentage of regionally-appropriate plants (native and/or non-invasive adapted plants)</p> <p><i>National model requirements range from 25% - 80% regionally-appropriate plants, while past development agreements in Austin have required up to 90% - 95% of the plants to be native to Central Texas (excluding invasive or problem species). Some national models also relax landscaping requirements (number or size of trees, parking lot spacing requirements, etc.) when native or drought-tolerant species are used.</i></p>	4	0	4

c. Require potable water budget (monthly or yearly)  <i>Outdoor water budget could be determined based on the amount of landscaped area, an estimate of irrigation efficiency, and the local evapotranspiration rate for cool season grasses (or warm season grasses to yield a more conservative budget). A site could then only exceed its water budget using non-potable sources.</i>	1	0	1
d. Write-in			
Increase soil health and depth to decrease reliance on supplemental irrigation  <i>Some national models specify soil depth and soil amendment requirements for landscaped areas.</i>	5	0	5
Work towards goal of no potable water for irrigation, even under drought conditions  <i>This option is not supported by all stakeholders.</i>	0	0	0
Incentivize advanced irrigation techniques such as smart controllers, soil moisture sensors, drip irrigation, and mulch.	0	0	0

**Key Topic 8: Special considerations for redevelopment for onsite infiltration/retention requirements**

Total votes = 6 (5 stakeholder, 1 staff)

Almost all of the national models for infiltration, retention, and beneficial re-use requirements have alternative standards for redevelopment, pollution hotspots, karst, areas with a shallow water table, and other unique site conditions. Furthermore, on high impervious sites, infiltration-based approaches may not be feasible because they can potentially occupy a significant percentage of the site area. National models for alternative compliance options for redevelopment range from small reductions in the required capture volume to a complete exemption from the requirements. The following solutions represent various approaches to handling onsite infiltration/retention requirements for redevelopment.

Potential Solutions	Stakeholder votes	Staff votes	Total votes
a. Reduce the amount retained for redevelopment (Washington D.C. model)  <i>Washington D.C. requires the 90<sup>th</sup> (1.2 in) percentile storm to be retained onsite for new development, but this requirement is reduced to the 80th percentile storm for redevelopment. If onsite retention proves infeasible on new or redevelopment, the volume may be reduced by up to 50% if the difference is achieved offsite through payment-in-lieu or through purchase of credits from a market.</i>	1	0	1

<p>b. Allow sites to reduce retention by 10 - 50% if meet incentive standards (TN/WV model)</p> <p><i>Tennessee requires 1 inch to be retained onsite, but an incentive standard allows a reduction of this requirement up to 50% if the site provides certain public benefits (e.g. brownfield redevelopment, high density, transit oriented development, etc.). West Virginia uses an almost identical model.</i></p>	5	0	5
<p>c. Redevelopment should be held to greenfield standards</p>	1	2	3
<p>d. Write-in</p>			
<p>Offsite mitigation should occur within same watershed</p> <p><i>Consider additional offsite mitigation options such as the provision of open space and tree plantings.</i></p>	0	0	0

## Stormwater Options for Redevelopment & Infill

Current code requires new projects to manage the peak runoff flow from the site and ensure that the peak flow is not increased from predevelopment conditions. This is usually accomplished with flood detention. Many older sites built before detention requirements were introduced in 1974 lack detention facilities of any kind, and the runoff from these sites frequently contributes to downstream flooding.

Currently, flood detention is not generally required for redevelopment of these old existing sites if impervious cover is not increased and drainage patterns are not changed. As long as the project can demonstrate that it will not result in additional adverse flooding impact on another property, it does not have to add detention (Land Development Code [§ 25-7-61\(5a\)](#)). This is in contrast to our water quality codes, which require water quality controls for all redevelopment over 8,000 ft<sup>2</sup>. As Austin rapidly grows and many of these older sites are being redeveloped, projects are being constructed in areas that already experience local flooding due to undersized infrastructure that was built prior to our modern drainage criteria. The following solutions explore how to ask sites to contribute proportionately to solutions to address existing threats to public safety and property.

### ***9. Redevelopment should be required to mitigate its share of downstream flooding***

*Total votes = 12 (9 stakeholder, 3 staff)*

New development in Austin's central core has put a lot of pressure on the existing drainage infrastructure, much of which was constructed prior to our modern drainage criteria. The South Lamar neighborhood is a classic example of this problem, where some residents experience local flooding (associated with storm drains and minor channels) even for relatively small storms. In 2014, City Council passed a resolution directing the City Manager to address flooding in this area, and specifically to look for opportunities within the CodeNEXT process to "provide mitigation requirements to better manage density and its associated costs" ([link](#)). At the same time, Imagine Austin also encourages compact and connected development to help accommodate all the new residents that are expected by 2040. While we want to be able to redevelop our urban core, we also do not want to overwhelm our drainage infrastructure. When staff presented national models that require development to mitigate a share of downstream flooding proportionate to its impact, stakeholders strongly agreed with the basic premise. The following solutions explore how a potential regulatory framework could accomplish flood mitigation goals without putting undue burden on redevelopment projects.

Relevant code sections:

Chapter 25-7-61(5a): *A development application may not be approved unless [it] will not result in additional adverse flooding impact on another property.*



Potential Solutions	Stakeholder votes	Staff votes	Total votes
a. Manage 2 - 10-year storms onsite, while site pays into regional management of 25- and 100-year storms offsite  <i>Under many national models, detention requirements are triggered by the presence of downstream flooding problems or inadequate downstream conveyance.</i>	5	2	7
b. Offer density bonuses to incentivize onsite detention where none existed previously  <i>This option would require extensive collaboration and code testing with Planning and Zoning Department.</i>	11	1	12
c. Redevelopment should be held to greenfield flood mitigation standards  <i>Special consideration should be given to how this standard might apply in the new transition zones between neighborhoods and centers/corridors.</i>	3	1	4

#### 10. Adequacy of infrastructure capacity used to guide land-use planning and redevelopment

Total votes = 4 (3 stakeholder, 1 staff)

Over the course of the six GIWG meetings, stakeholders have advocated for a planning process that explicitly takes existing infrastructure capacity into account when planning for future growth. To ensure that new development does not overwhelm existing infrastructure, it is imperative that infrastructure and watershed health data inform the CodeNEXT process going forward.

Potential Solutions	Stakeholder votes	Staff votes	Total votes
a. Write-in			
Examine which watersheds have the capacity for increased density.	2	0	2
If a watershed has been determined to be at capacity, require new development to mitigate all stormwater impacts.  <i>This could be accomplished via detention or infrastructure upgrades. Do not allow payment-in-lieu, waivers, or variances.</i>	0	0	0
Redevelopment projects should reduce their impervious cover wherever possible.	0	0	0
Use a watershed basis for land use planning.	0	0	0