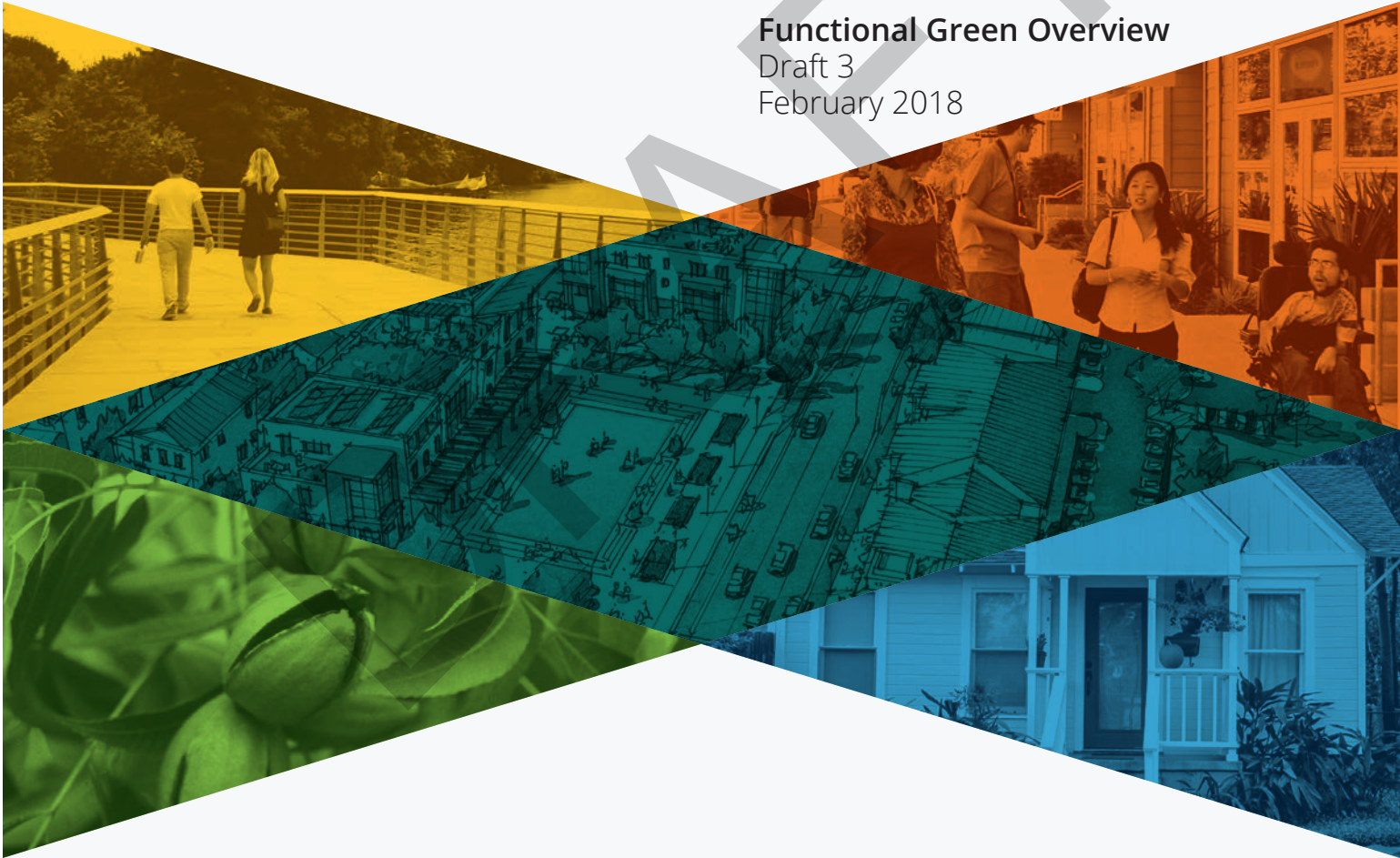


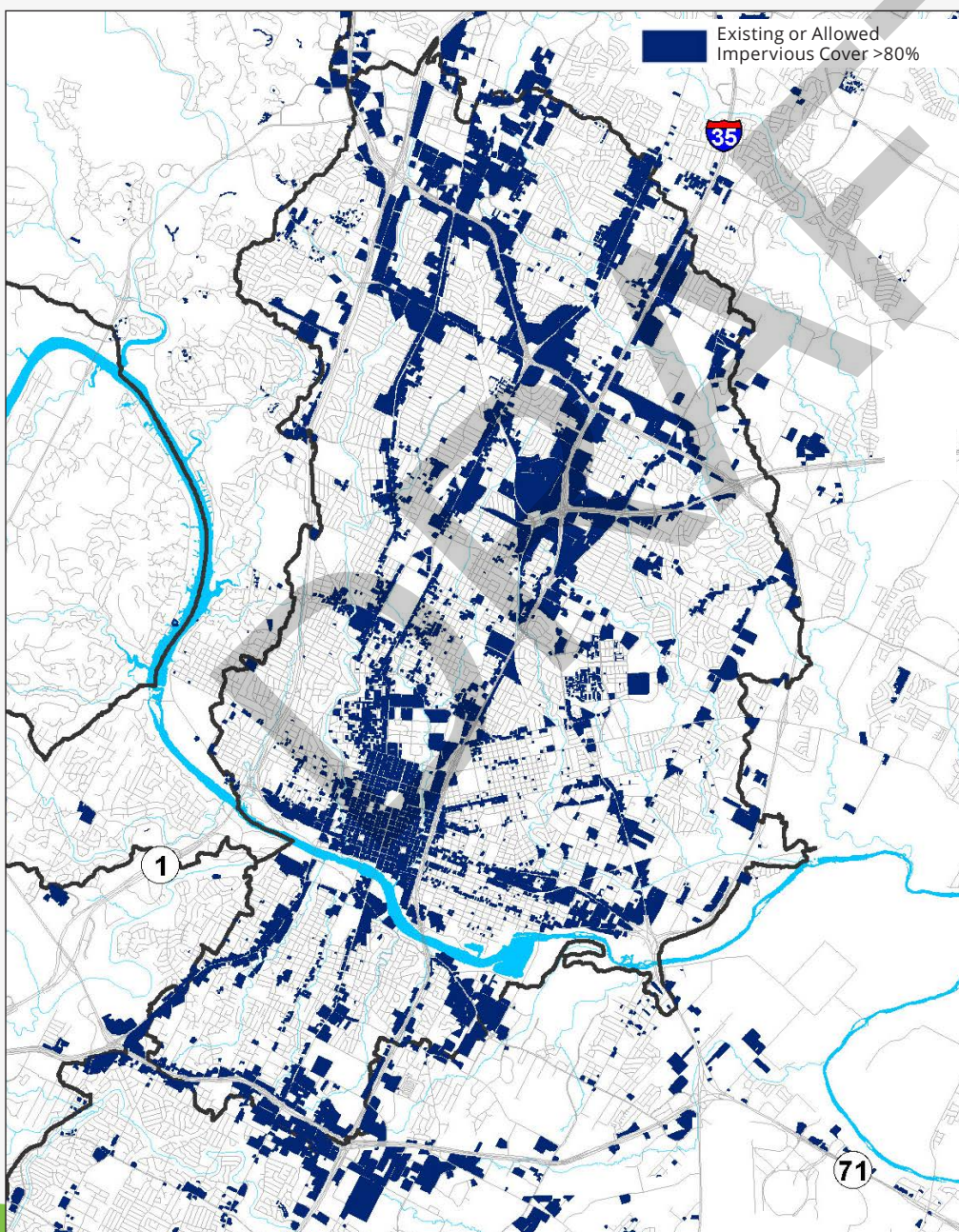
AUSTIN LAND DEVELOPMENT CODE

Functional Green Overview
Draft 3
February 2018



the need for FUNCTIONAL GREEN

“Integrating nature into the city” is one of the eight priorities identified in Imagine Austin. To reach this goal and meet growth demands, Austin must creatively integrate vegetated areas into newly built environments while also continuing to be good stewards of open spaces and parks. Functional Green is specifically focused on dense urban sites and is one of several tools developed to enhance green infrastructure in the city.



Functional Green applies to sites proposing an impervious cover limit greater than 80%. Functional Green will generally apply in the urban watersheds; however, sites outside the urban watersheds that currently have an impervious cover greater than 80%, and redevelop maintaining or exceeding that impervious cover, will also have to comply with the Functional Green requirements.

GOALS

1. INTEGRATE NATURE

Integrate nature into parcels where building cover or other impervious surfaces limit what the standard landscape code can accomplish.

2. PROVIDE FLEXIBILITY

Give developers a planning tool that is flexible and provides ecological benefits comparable to those achieved by the standard landscape code.

3. STRAIGHTFORWARD

Provide a program that is straightforward and clear to implement and review.



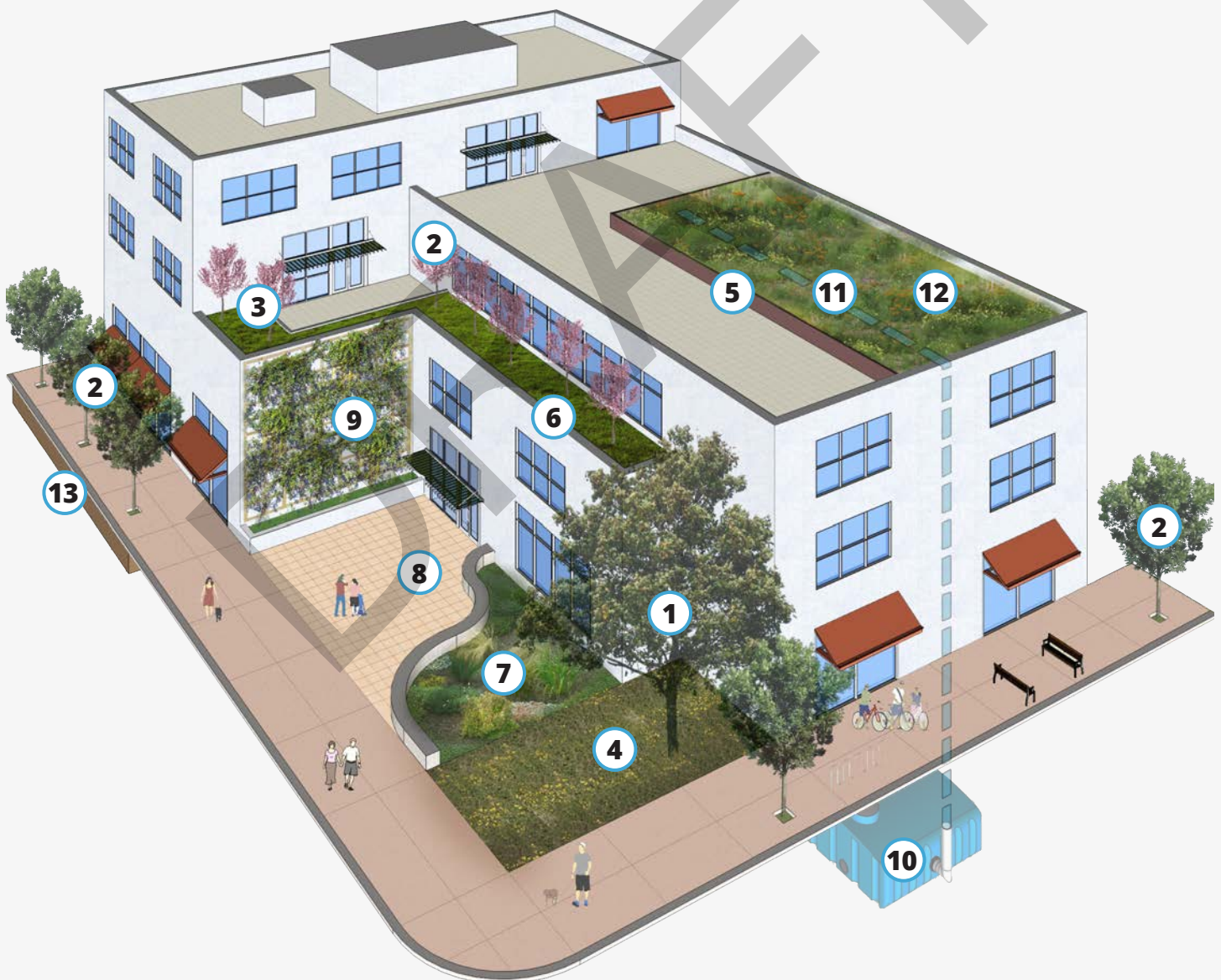
Photo by Juan Hernandez, Landscape Architecture by Mithun

Functional Green projects will comply with all other applicable code requirements, including tree preservation, stormwater management, and impervious cover limits. The specific requirements of Functional Green, including definitions and calculations, will be prescribed in the Environmental Criteria Manual and is referenced in section 23-4E-4120 of the Land Development Code. Many of the practices a site could use to achieve Functional Green also meet other requirements, thereby assisting compliance with multiple parts of the code.

functional green

TARGET SCORE

Projects eligible for Functional Green will be required to meet a specified target score that represents the ecological function of a site relative to the total site area. A draft target score of 0.3 has been established based on multiple case studies of built and planned projects across the city. To meet the target score, developers can choose from a suite of Landscape Elements that are common in urban environments. Case studies show that a target score of 0.3 is achievable and provides high ecological performance and human health benefits.



Note: Numbers refer to Landscape Elements listed on the opposite page.

To calculate the Functional Green score, the total area of each landscape element is determined and then multiplied by an established factor. The weighted-area value of each landscape element is then summed and divided by the total area of the site.

$$\text{FUNCTIONAL GREEN SCORE} = \frac{\left(\begin{array}{l} \text{Area (sq. ft.)} \\ \text{of Landscape} \\ \text{Element A} \\ \times \text{Factor A} \end{array} + \begin{array}{l} \text{Area (sq. ft.)} \\ \text{of Landscape} \\ \text{Element B} \\ \times \text{Factor B} \end{array} + \begin{array}{l} \text{Area (sq. ft.)} \\ \text{of Landscape} \\ \text{Element C} \\ \times \text{Factor C} \end{array} \right)}{\text{Total Area (sq. ft.) of Site}^*}$$

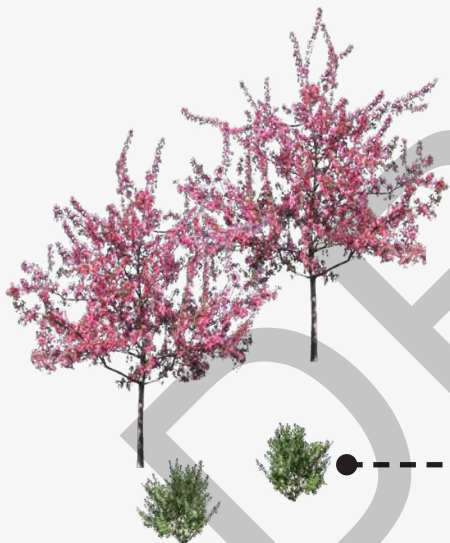
* Landscape Elements integrated into the right-of-way can also be claimed for Functional Green credit; however, the right-of-way is not included in the total site area.

| LANDSCAPE ELEMENTS | | |
|---------------------|--|--------|
| PLANTED AREA | | FACTOR |
| ① | Existing Trees | 0.8 |
| ② | Newly Planted Tree: Large | 0.6 |
| ② | Newly Planted Tree: Medium | 0.5 |
| ② | Newly Planted Tree: Small | 0.4 |
| ③ | Shrubs / Ornamental Grasses / Perennials | 0.3 |
| ④ | Ground Cover | 0.2 |
| SPECIALIZED MEDIA | | |
| ⑤ | Extensive Green Roof | 0.5 |
| ⑥ | Intensive Green Roof | 0.6 |
| ⑦ | Rain Garden | 0.3 |
| ADDITIONAL ELEMENTS | | |
| ⑧ | Porous Pavement | 0.4 |
| ⑨ | Vegetated Wall | 0.5 |
| ⑩ | Cistern | 0.3 |
| BONUS OPTIONS | | |
| ⑪ | Auxiliary Water Irrigation | 0.2 |
| ⑫ | Pollinator Resource | 0.1 |
| ⑬ | Suspended Pavement System | 0.2 |

maximize target score

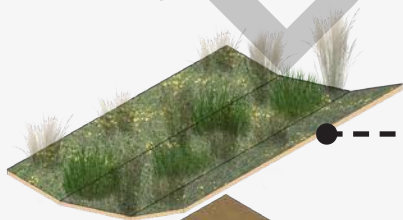
LAYERING LANDSCAPE ELEMENTS

Landscape Elements can be layered to optimize ecological function within a small area. By creatively stacking multiple elements, a site can enhance the benefits it provides and boost its Functional Green score.



SMALL TREE

SHRUBS



ORNAMENTAL GRASSES



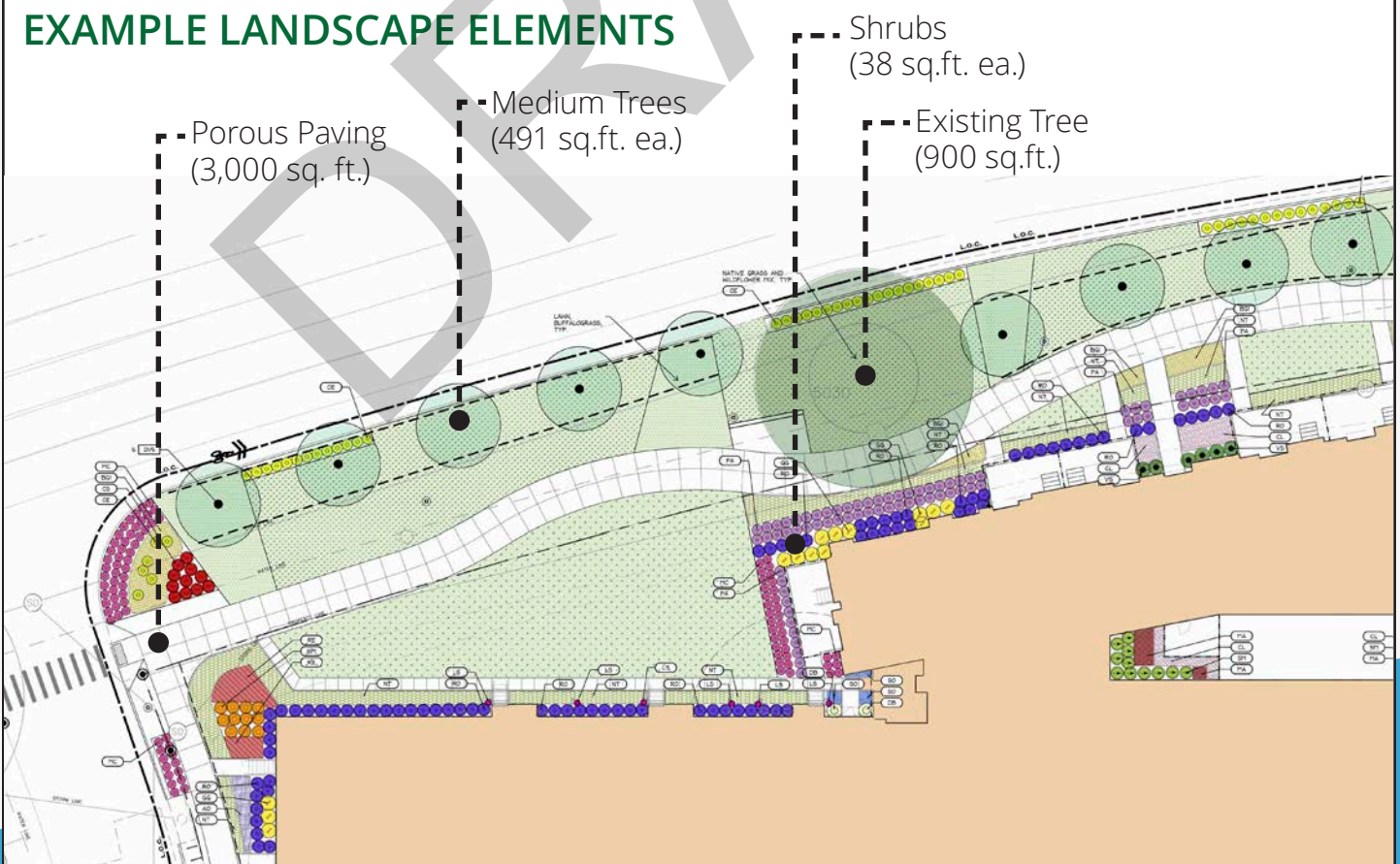
RAIN GARDEN

FUNCTIONAL GREEN SCORE SHEET

| Project title: | | enter sq ft of parcel | |
|--|--|-----------------------|------------------------|
| Parcel size (enter this value first) * | | | FUNCTIONAL GREEN SCORE |
| Landscape Elements** | | | Factor |
| A Planted area coverage | | | |
| 1 | Existing tree | enter sq ft 0 | 0.8 |
| 2 | Large newly planted tree (mature width 40' or greater) | enter sq ft | 0.6 |
| 3 | Medium newly planted tree (mature width 20-39') | enter sq ft 0 | 0.5 |
| 4 | Small newly planted tree (mature width 10-19') | enter sq ft | 0.4 |
| 5 | Shrubs, ornamental grasses, and large perennials | enter sq ft 0 | 0.3 |
| 6 | Ground cover | enter sq ft 0 | 0.2 |
| B Specialized media | | | |
| 7 | Green roof - extensive | enter sq ft 0 | 0.5 |

The City will provide Functional Green guidance documents and calculation forms, including a simple spreadsheet to aid in determining a site's score. Each site will enter the total square footage of the project area and the square footage of each Landscape Element. The Functional Green score will then be calculated automatically within the spreadsheet.

EXAMPLE LANDSCAPE ELEMENTS



functional green LANDSCAPE ELEMENTS

A primary goal of Functional Green is to enhance the vegetated area and ecological performance of dense urban sites. Functional Green is based on the science of “ecosystem services,” the important benefits that people receive from healthy functioning ecosystems. Like other landscapes, Functional Green projects have the potential to provide ecosystem services (such as cleaning the air, regulating microclimate, and providing habitat for wildlife) that benefit both site users and the surrounding community.

A total of a 120 published studies were reviewed to identify the ecological and economic benefits that could be expected from each Landscape Element in Austin. These studies provided a basis for rating the relative performance of each Landscape Element based on 9 key considerations:

-  Microclimate Regulation
-  Water Filtration
-  Carbon Storage and Sequestration
-  Biodiversity Benefits
-  Air Pollutant Removal
-  Human Well-Being
-  Stormwater Retention
-  Effects on Property Value
-  Effects on Developable Area

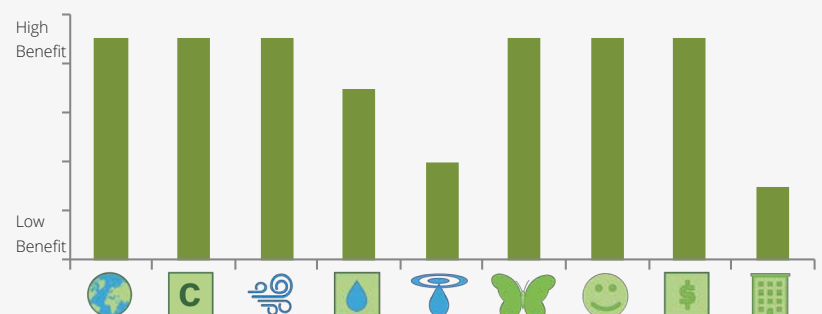


EXISTING TREES AND LARGE, MEDIUM, AND SMALL TREES

Factor: 0.4 - 0.8

Cost: \$\$

Existing trees receive the highest factor score because of the high level of benefits they provide. Newly planted trees receive credit based on their estimated size at maturity (small, medium, and large).



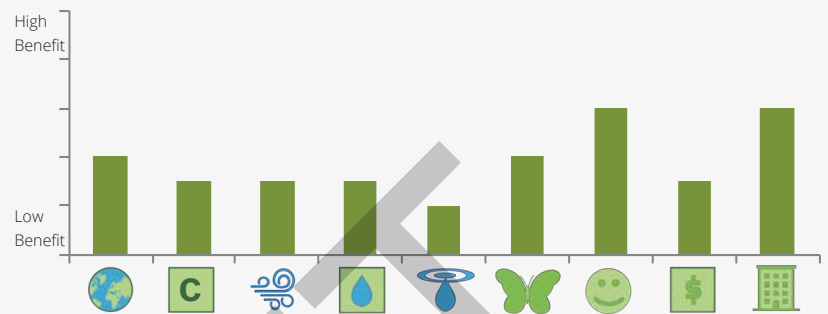


SHRUBS, ORNAMENTAL GRASSES, LARGE PERENNIALS, OR GROUND COVER

Factor: 0.2 - 0.3

Cost: \$

Shrubs are woody vegetation over 2 feet in height with a mature width of 9 feet or less. Ornamental grasses and perennials have a mature height of at least 2 feet and must be evergreen or have year round structure. Ground cover is low spreading vegetation less than 24 inches in height.

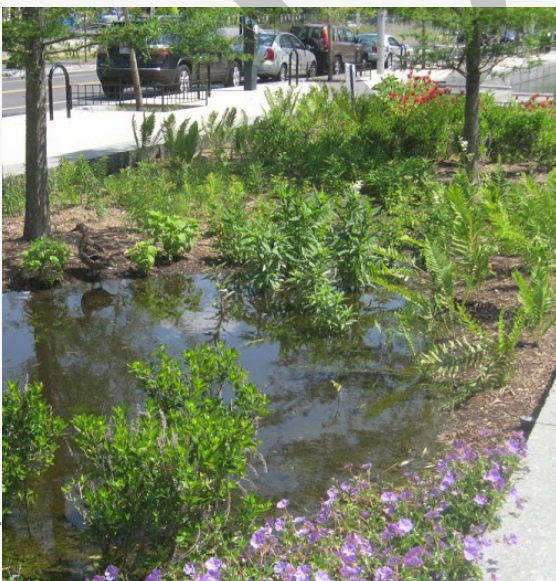
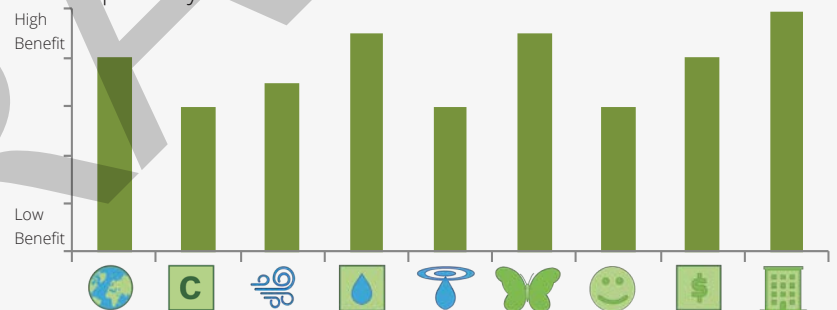


EXTENSIVE AND INTENSIVE GREEN ROOF

Factor: 0.5 - 0.6

Cost: \$\$\$ - \$\$\$\$

Green roofs cover buildings, parking garages, and other elevated surfaces with a vegetated surface and growing media. Projects can use both extensive (media less than 7" deep) and intensive (media 7" deep or greater) green roofs. Additional credit for the plantings in the green roof is counted separately.

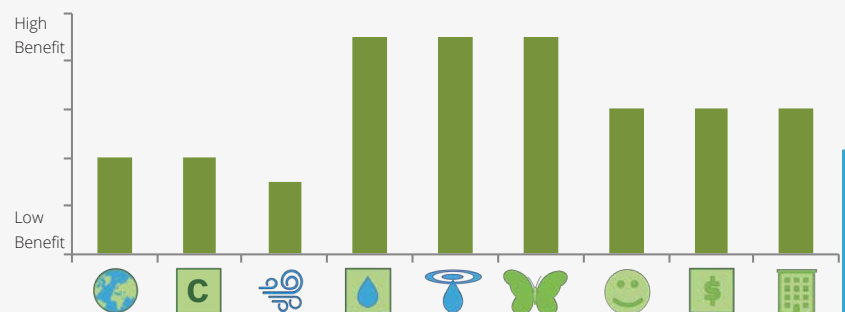


RAIN GARDEN

Factor: 0.3

Cost: \$ - \$\$

A rain garden is a vegetated, depressed landscape area designed to capture and infiltrate and/or filter stormwater runoff. Rain garden media is either native soil or biofiltration media. Additional credit for the vegetation in the rain garden is counted separately.



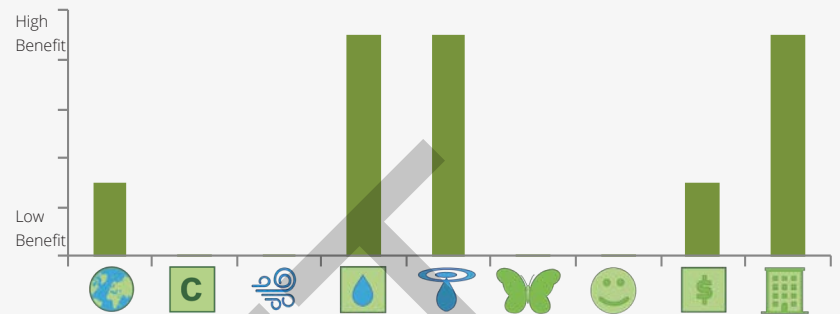


POROUS PAVEMENT

Factor: 0.4

Cost: \$\$

Porous pavement allows water to pass through voids in the paving material or between pavers while providing a stable, load-bearing surface. Permeable interlocking pavers may also be used if installed with gaps to allow stormwater to infiltrate into the subsurface.

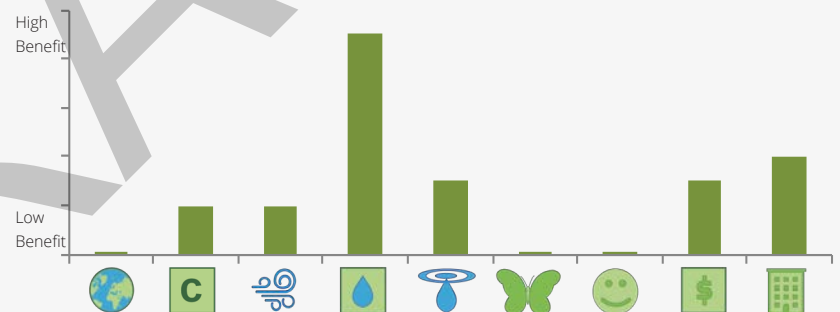


CISTERN

Factor: 0.3

Cost: \$\$ - \$\$\$

Cisterns can be located above or below ground and provide a reservoir for temporarily storing rainwater or a/c condensate. Credit is given for the storage capacity of the cistern.

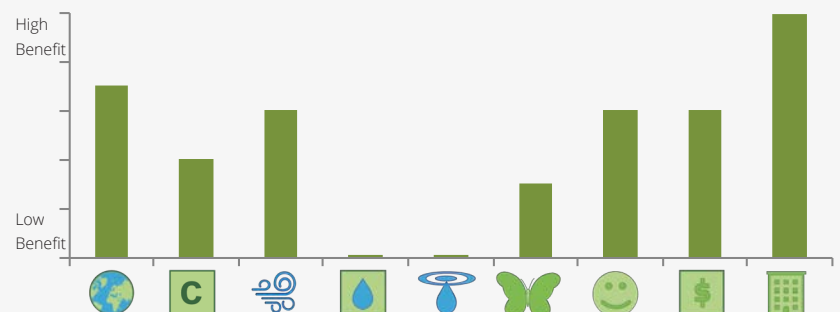


VEGETATED WALL

Factor: 0.5

Cost: \$ - \$\$\$

Vegetated walls are vertical surfaces created by vines and climbing plants that are rooted in soil or containers, growing upwards or cascading down. Vegetated walls include walls, screens, or trellises with climbing vines, trailing plants, or espaliered trees.





BONUS OPTION: AUXILIARY WATER IRRIGATION

Factor: 0.2

Cost: \$

Auxiliary water, as defined by the plumbing code, consists of a/c condensate, rainwater, or reclaimed stormwater collected from the site and reused for landscape irrigation purposes.



BONUS OPTION: POLLINATOR RESOURCES

Factor: 0.1

Cost: \$

This bonus offers additional credit for native plant species that have been identified by the Xerces Society for Invertebrate Conservation as providing additional resources for pollinators.

Photo by Joe Marcus, Lady Bird Johnson Wildflower Center



BONUS OPTION: SUSPENDED PAVEMENT SYSTEM

Factor: 0.2

Cost: \$\$ - \$\$\$

Paving techniques designed to transfer the load from pavement directly to the subsoil, rather than the topsoil media, promote additional soil volume for trees that may otherwise be unavailable with a conventional pavement system.

selected case study

SOUTH CONGRESS HOTEL

Functional Green Score: 0.33

Use: Hotel

Site Area: 0.95 acres

Impervious Cover: 95%

This hotel currently achieves a score greater than the target score of 0.3 through the use of planted trees, shrubs, ornamental plants, ground cover, and vegetated walls creatively layered and integrated into the site.



Photo by Google Maps

Google



Photo by Adam Barbe

selected case study

AUSTONIAN

Functional Green Score: 0.31

Use: Mixed-use

Site Area: 0.65 acres

Impervious Cover: 100%

This residential high-rise currently achieves a score greater than the target score of 0.3 with planted trees, an extensive and intensive green roof, shrubs, ornamental grasses, ground cover, a cistern, and auxiliary water irrigation of the landscape.



Photo by TBG Partners



Photo by TBG Partners

selected case study

GALILEO AT 25th

Functional Green Score: 0.22

Use: Residential

Size: 0.33 acres

Impervious Cover: 90%

This residential low-rise currently achieves a score of 0.22 with planted trees, shrubs, and ground cover. One way the project could reach the target score of 0.3 is with the additions of:

- + 1000 sq. ft. vegetated wall;
- + 2,710 gallon cistern;
- + Landscape irrigation with auxiliary water; and
- + Suspended pavement system.

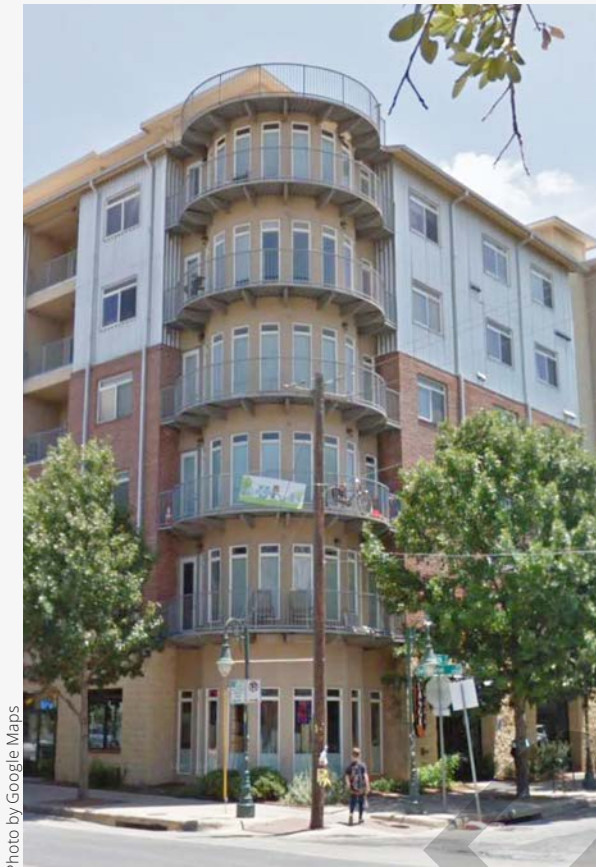


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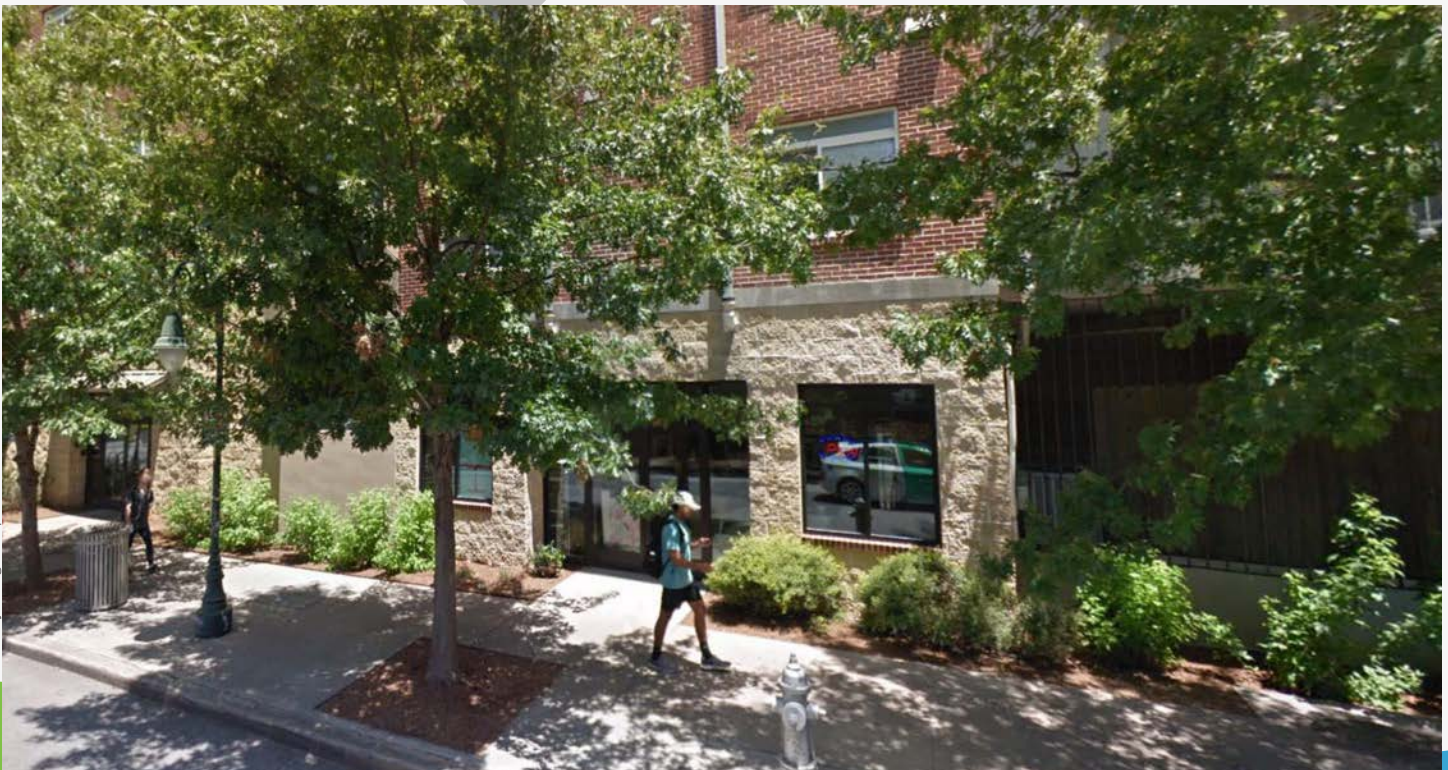


Photo by Google Maps

selected case study

5th + COLORADO

Functional Green Score: 0.13

Use: Office

Site Area: 0.66 acres

Impervious Cover: 100%

This downtown office high-rise currently achieves a score of 0.13 with planted trees and a suspended pavement system. The project could reach the target score of 0.3 with the additions of:


- + 5000 sq. ft. extensive green roof;
- + 6,177 gallon cistern; and
- + Landscape irrigation with auxiliary water.



Help us get it right.

Austin's Land Development Code is getting its most significant update in thirty years.

As we work toward adoption of the new code, we invite you to review and comment on the draft code document, ask questions, and stay connected.

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CODE NEXT

