9:30 AM  Welcome and Workshop Introduction  
Shawn Conrad, Principal Transportation Planner, NCTCOG  
Sydnee Steelman, Transportation Planner, NCTCOG

9:35 AM - 11:05 AM  OVERVIEW OF GREEN INFRASTRUCTURE RESOURCES  
Resources and Opportunities  
Economic and Environmental Benefits of Stewardship Tool  
Kate Zielke, Principal Transportation Planner, NCTCOG  
RISE Coalition  
Tamara Cook, Senior Program Manager, NCTCOG  
Transportation integrated Stormwater Management (TriSWM)  
Tamara Cook, Senior Program Manager, NCTCOG  
Overview of the EPA Green Infrastructure Program and Available Resources  
Brent Larsen, Section Chief, US EPA Region 6  
Nelly Smith, State and Tribal Programs Chief, US EPA Region 6  
Session Q&A

11:05 AM – 12:00 PM  LOCAL EXAMPLES AND IMPLEMENTATION STRATEGIES  
Drainage and Stormwater  
Bioswales: City of Lewisville Old Town Project  
Sagar Medisetty, Traffic Engineer, City of Lewisville  
Rain Gardens: City of Dallas Beckley/Commerce St intersection Green Street Project  
Don Raines, Senior Planner, City of Dallas  
Rain Gardens: Elm Street Streetscape Improvements  
Christina Turner-Noteware, City Engineer, City of Dallas  
Session Q&A

12:00 PM – 1:00 PM  Lunch
LOCAL EXAMPLES AND IMPLEMENTATION STRATEGIES (Cont.)

1:00 PM – 2:25 PM
Pavements and Surfaces
Silva Cells: Sundance Square Plaza in Fort Worth and San Jacinto Plaza, Rockwall
Brenda Guglielmina, Account Manager, DeepRoot Consulting

Permeable Pavements: The Green at College Park, Arlington
David Hopman, Associate Professor at the University of Texas at Arlington

Lighting
LED Lighting: City of Arlington LED Streetlights Conversion
Oscar Valle, Public Works Operations Supervisor, City of Arlington

Solar Lighting: Bus Shelter Solar Lighting, Trinity Metro
Sandip Sen, Service Implementation Manager, Trinity Metro

Session Q&A

2:25 PM – 2:30 PM
CLOSING
Wrap-Up/Final Thoughts
NCTCOG Green Transportation Infrastructure

Sundance Square-Fort Worth

San Jacinto Plaza-Rockwall
Silva Cell 2 - 3 Heights for Design Flexibility

1x system
- System Height: 16.7"
- Width: 24"
- Length: 46"
- Soil volume capacity: approximately 10 cubic ft of soil

2x system
- System Height: 31"
- Width: 24"
- Length: 46"
- Soil volume capacity: approximately 20 cubic ft of soil

3x system
- System Height: 43"
- Width: 24"
- Length: 48"
- Soil volume capacity: approximately 30 cubic ft of soil
<table>
<thead>
<tr>
<th>Canopy Diameter (DBH)</th>
<th>Trunk Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>39'</td>
<td>24'</td>
</tr>
<tr>
<td>36'</td>
<td>20'</td>
</tr>
<tr>
<td>32'</td>
<td>16'</td>
</tr>
<tr>
<td>27'</td>
<td>12'</td>
</tr>
<tr>
<td>21'</td>
<td>8'</td>
</tr>
<tr>
<td>14'</td>
<td>4'</td>
</tr>
</tbody>
</table>

Example: A 16" Diameter Tree Trunk (36" Canopy Diameter) Requires 1000 ft³ of Soil

Example: 1000 ft³ of Soil Stores 200 ft³ of Stormwater
Designed for Vehicular Loading

HS20 Load Rating

Parking Bays
Plazas
Parking Lots
On-Structure
Sidewalks
Bike Lanes
Traditional Bio Swale

- Uses a lot of land
- Collect garbage
- High Maintenance cost
- TSS is managed on top of the soil
• Take up no space
• Doesn’t collect garbage
• 0 Maintenance cost
• TTS and heavy metals treated under the pavement
• Do not lose Parking Spaces
• Shade for every car
• Passive Irrigation for the Trees
Silva Cell 1 Installation
This is our 2 stack system with water line
DeepRoot Green Infrastructure LLC

• Brenda Guglielmina
• Brenda@deeproot.com
• www.deeproot.com

Thank You!!!!
The Green at College Park - University of Texas, Arlington
NCTCOG Green Infrastructure Workshop

**Location:** Arlington, Texas

**Size:** 2.6 acres / 112,820 ft²

**Type:** Educational / Institutional

**Team:** Schrickel, Rollins and Associates (now Parkhill)

The University of Texas at Arlington, NCTCOG

David Hopman, ASLA – The University of Texas at Arlington, Landscape Architecture Program
dhopman@uta.edu
College Park District
College Park District
THE SUSTAINABLE SITES INITIATIVE™

The Green at College Park

Designed by landscape architects and civil engineers at Schrickel, Rollins, and Associates

Constructed by Northstar Construction

Additional support from The City of Arlington and The North Central Texas Council of Governments
The 2.6 Acre combined site was developed to:

- Create a native/adapted garden,
- Predominately function as a sustainable rain garden system.
- Use plants native to North Central Texas in the waterways, selected because of their ability to thrive in drought / flood conditions.
Sustainability Features

The site’s other sustainability features include:

- reducing use of potable water,
- designing rainwater/stormwater features to provide landscape amenity,
- using native/adapted plants,
- reducing urban heat island effects,
- using recycled and regional material;
- design for human health and well-being; and,
- promoting sustainability awareness and education.
SUSTAINABLE SITES INITIATIVE™

HEREBY CERTIFIES

THE GREEN AT COLLEGE PARK
ARLINGTON, TEXAS

HAS SUCCESSFULLY MET THE SUSTAINABLE SITES INITIATIVE CRITERIA REQUIRED UNDER
THE SUSTAINABLE SITES INITIATIVE: GUIDELINES AND PERFORMANCE BENCHMARKS 2009
TO EARN A ONE STAR CERTIFICATION RATING.

2012 SITES CERTIFIED

Nancy C. Somerville, Executive Director, American Society of Landscape Architects
Susan Rieff, Executive Director, Lady Bird Johnson Wildflower Center at The University of Texas at Austin
Holly Shimizu, Executive Director, United States Botanic Garden
THE SUSTAINABLE SITES INITIATIVE™

Structure of the Prerequisites and Credits:

1. Site Context
2. Pre-Design Assessment and Planning
3. Site Design - Water
4. Site Design - Soil and Vegetation
5. Site Design - Materials and Selection
6. Site Design - Human Health and Well-Being
7. Construction
8. Operations and Maintenance
9. Education and Performance Monitoring
10. Innovation or Exemplary Performance
DEVELOPMENT ISSUES THAT INCREASE IMPERVIOUS COVER

- Removal of Tree Canopy Cover
- Removal of Ground Cover – Vegetation
- Removal of Permeable Top Soil
- Severe compaction and paving of remaining soil
- Underground Pipe and Sewer Infrastructures

Source: Elena Berg, Planner
College Park District site in 2007

College Park District site in 2016

Source: Google Maps
## Biomass Density Calculations
From the Sustainable Sites Initiative

<table>
<thead>
<tr>
<th>Land Cover/vegetation type zones</th>
<th>Biomass density index for Arlington, TX</th>
<th>Total Site Area (sq.ft.)= 113400</th>
<th>Percentage of total site area for this zone</th>
<th>Biomass density value x percentage of total site area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees with understory</td>
<td>6</td>
<td>580</td>
<td>0.01</td>
<td>0.03</td>
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<tr>
<td>Trees without understory (less than 10% herbaceous shrub cover)</td>
<td>4</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Shrubs</td>
<td>3</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Desert Plants</td>
<td>1.5</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Annual plantings</td>
<td>1.5</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Grasslands and turf grass</td>
<td>2</td>
<td>40220</td>
<td>0.35</td>
<td>0.71</td>
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<tr>
<td>Wetlands</td>
<td>6</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Impervious cover or bare ground not shaded by vegetation structures</td>
<td>0</td>
<td>72600</td>
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<td>0.00</td>
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<tr>
<td>SUBTOTAL</td>
<td></td>
<td>113400</td>
<td>1.00</td>
<td>0.74</td>
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Existing site BDI (Bio Mass Density) 0.74
## Biomass Density Calculations
### From the Sustainable Sites Initiative

### PLANNED SITE BDI

<table>
<thead>
<tr>
<th>Land Cover/vegetation type zones</th>
<th>Biomass density index for Arlington, TX</th>
<th>Area in square feet</th>
<th>Percentage of total site area for this zone</th>
<th>Biomass density value x percentage of total site area</th>
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</thead>
<tbody>
<tr>
<td>Trees with understory</td>
<td>6</td>
<td>31800</td>
<td>0.28</td>
<td>1.68</td>
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<tr>
<td>Trees without understory (less than 10% herbaceous shrub cover)</td>
<td>4</td>
<td>4302</td>
<td>0.04</td>
<td>0.15</td>
</tr>
<tr>
<td>Shrubs</td>
<td>3</td>
<td>3741</td>
<td>0.03</td>
<td>0.10</td>
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<tr>
<td>Desert Plants</td>
<td>1.5</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Annual plantings</td>
<td>1.5</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Grasslands and turf grass</td>
<td>2</td>
<td>44049</td>
<td>0.39</td>
<td>0.78</td>
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<tr>
<td>Wetlands</td>
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<td>13104</td>
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<td>0.69</td>
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<td>0</td>
<td>16404</td>
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<td>0.00</td>
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<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>113400</strong></td>
<td></td>
<td><strong>1.00</strong></td>
<td><strong>3.40</strong></td>
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<tr>
<td><strong>ADDITIONAL VALUE</strong> for horizontal or vertical surfaces covered with vegetation</td>
<td>0</td>
<td></td>
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</table>

**Planned site BDI (Bio Mass Density)**

<table>
<thead>
<tr>
<th>Existing Site BDI</th>
<th>0-0.5</th>
<th>0.5-1.0</th>
<th>1.0-1.5</th>
<th>1.5-2.0</th>
<th>2.0 and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-0.5</td>
<td>No credit</td>
<td>3 POINTS</td>
<td>5 POINTS</td>
<td>8 POINTS</td>
<td>8 POINTS</td>
</tr>
<tr>
<td>0.5-1.0</td>
<td>No credit</td>
<td>No credit</td>
<td>3 POINTS</td>
<td>5 POINTS</td>
<td>8 POINTS</td>
</tr>
<tr>
<td>1.0-1.5</td>
<td>No credit</td>
<td>No credit</td>
<td>No credit</td>
<td>3 POINTS</td>
<td>8 POINTS</td>
</tr>
<tr>
<td>1.5-2.0</td>
<td>No credit</td>
<td>No credit</td>
<td>No credit</td>
<td>No credit</td>
<td>8 POINTS</td>
</tr>
<tr>
<td>2.0 and above</td>
<td>No credit</td>
<td>No credit</td>
<td>No credit</td>
<td>No credit</td>
<td>8 POINTS</td>
</tr>
</tbody>
</table>
The Green at UTA College Park, UTA

Credit 4.12:

Intent:
Use vegetation and reflective materials to reduce heat islands and minimize effects on microclimate and on human and wildlife habitat.

Requirements:
5 points: Use any combination of the following options to reduce urban heat island effects for 60 percent of all site hardscape and structures (including roads, sidewalks, courtyards, shelters, and parking lots):

Provided:
Material Use Plan

Calculations:

1. Permeable Paving (permeable concrete + recycled glass + permeable granite) 3707 sq.ft.
2. Concrete Pavers >29 SRI 2015
3. Concrete Paving >29 SRI 8671 sq.ft.
4. Limestone >29 SRI 184 sq.ft.
5. Decomposed Granite >29 SRI 5300 sq.ft.
7. Flagstone >29 SRI 530 sq.ft.

Hardscapes material with >29 SRI = 73%
Credit 3.5: Manage stormwater on site

GOALS:

Achieve 60 percent improvement in water storage capacity.
(Brownfield)

Target CN = 83

<table>
<thead>
<tr>
<th>CONDITIONS</th>
<th>AREA</th>
<th>ACRES</th>
<th>WEIGHTED CN</th>
<th>% IMPERVIOUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>A1</td>
<td>2.59</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Target</td>
<td>A1</td>
<td>2.59</td>
<td>83</td>
<td>15</td>
</tr>
</tbody>
</table>

Existing Impervious Curve Number (water storage capacity) = 98; Open CN = 80

The Green at College Park, University of Texas at Arlington
UTA Green at College Park
**A Green Solution to Water Pollution**

**College Park Center Drainage** consists of surface runoff, storm water from roof drains and condensate from the air conditioning system.

The **Rain Channel** is conveyance system that consists of a porous soil structure protected by a layer of rock mulch. This channel increases infiltration of runoff into the soil and filters total suspended solids.

The **Storm Spring** relieves pressure from the underground campus storm drainage system. During large storm events, it functions as a reverse inlet, allowing storm drainage from underground pipes to overflow into the oval lawn area for detention.

The **Detention Lawn** temporarily holds water during large storm events and gradually allows it to drain into the **Rill Garden**.

The **Rill Garden** is a complex system of vegetation that thrives in drought and flood conditions. Below the surfacelayer of rock mulch is a porous soil structure that increases infiltration. The soil system, rock mulch and vegetation work together to remove pollutants from storm run-off. This garden replaces an eroded drainage channel that existed on the site.

The **Check Dam** helps to filter storm water and encourages infiltration by reducing velocity and increasing the amount of time storm water is detained on site.

The **Overflow Structure** controls the amount of water that leaves the garden and drains to Johnson Creek. The controlled release also alleviates flooding of adjacent streets.

The **Biofilter** is a vegetated system that removes total suspended solids from parking lot run-off before eventually draining into the rill garden.

The **Microdepressions** are shallow depressions in the landscape that are sculpted to retain irrigation and storm runoff. Below the depressions are large rock sumps that store water and release it into the soil to be used by surrounding vegetation. Planted in the shallow areas are native plants that grow in wet soil conditions.
Credit 3.5: Manage stormwater on site

<table>
<thead>
<tr>
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<th>ACRES</th>
<th>WEIGHTED CN</th>
<th>% IMPERVIOUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>A1</td>
<td>2.59</td>
<td>95</td>
<td>95</td>
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<tr>
<td>Proposed</td>
<td>A1</td>
<td>2.59</td>
<td>83</td>
<td>15</td>
</tr>
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</table>

Impervious CN = 98; Open CN = 80

Image Source: Parkhill
Credit 3.5: Manage stormwater on site

The Green at College Park, University of Texas at Arlington

<table>
<thead>
<tr>
<th>CONDITIONS</th>
<th>AREA</th>
<th>ACRES</th>
<th>WEIGHTED CN</th>
<th>% IMPERVIOUS</th>
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</thead>
<tbody>
<tr>
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<td>2.59</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Proposed</td>
<td>A1</td>
<td>2.59</td>
<td>83</td>
<td>15</td>
</tr>
</tbody>
</table>

Impervious CN = 98; Open CN = 80
UTA Green at College Park
UTA Green at College Park
UTA Green at College Park
UTA Green at College Park: 2020
Decomposed Granite

FilterPave

UTA Green at College Park: 2021
### UTA Green at College Park

#### PLANT LEGEND – SHRUBS, VINES & ORNAMENTAL GRASSES

<table>
<thead>
<tr>
<th>QTY.</th>
<th>COMMON NAME</th>
<th>SCIENTIFIC NAME</th>
<th>SIZE – REMARKS</th>
<th>SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>DWARF YAUPON HOLLY</td>
<td>Ilex vomitoria 'homa'</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
</tr>
<tr>
<td>19</td>
<td>TEXAS SAGE</td>
<td>Leucophyllum candidum 'Thunder Cloud'</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
</tr>
<tr>
<td>62</td>
<td>GULF MUHLY</td>
<td>Multienbergia capillaris 'Lanza'</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
</tr>
<tr>
<td>123</td>
<td>LINDHEIMER'S MUHLY</td>
<td>Multienbergia lindheimeri 'Lani'</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
</tr>
<tr>
<td>15</td>
<td>PASSIONFLOWER</td>
<td>Passiflora X 'Lavender Lady'</td>
<td>5 GAL.</td>
<td>AS SHOWN</td>
</tr>
<tr>
<td>20</td>
<td>FRAGRANT SUMAC</td>
<td>Rhus aromatica 'Gro-low'</td>
<td>5 GAL.</td>
<td>72” O.C.</td>
</tr>
<tr>
<td>33</td>
<td>KNOCK-OUT ROSE</td>
<td>Rosa X</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
</tr>
<tr>
<td>78</td>
<td>MEXICAN FEATHERGRASS</td>
<td>Stipa tenuissima</td>
<td>3 GAL.</td>
<td>24” O.C.</td>
</tr>
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</table>

#### PLANT LEGEND – RILL GARDEN & RAIN PLANTERS CONT'D.

<table>
<thead>
<tr>
<th>SYMB.</th>
<th>QTY.</th>
<th>COMMON NAME</th>
<th>SCIENTIFIC NAME</th>
<th>SIZE – REMARKS</th>
<th>SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>12</td>
<td>UPRIGHT SEDGE</td>
<td>Carex stricta</td>
<td>3 GAL.</td>
<td>36” O.C.</td>
</tr>
<tr>
<td>CT</td>
<td>1616</td>
<td>TEXAS SEDGE</td>
<td>Carex texanae</td>
<td>PLUGS</td>
<td>6” O.C.</td>
</tr>
<tr>
<td>EC</td>
<td>25</td>
<td>BLUE MISTFLOWER</td>
<td>Eupatorium coelestinum</td>
<td>1 GAL.</td>
<td>24” O.C.</td>
</tr>
<tr>
<td>EH</td>
<td>356</td>
<td>HORSETAIL RUSH</td>
<td>Equisetum hyemale</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
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<tr>
<td>EP</td>
<td>25</td>
<td>JOE-FYE WEED</td>
<td>Eupatorium purpureum</td>
<td>1 GAL.</td>
<td>36” O.C.</td>
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<tr>
<td>HL</td>
<td>6</td>
<td>HALBIRD-LEAF HIBSUS</td>
<td>Hibiscus triondls</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
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<tr>
<td>HM</td>
<td>7</td>
<td>CRIMSON-EYED MALLOW</td>
<td>Hibiscus moscheuto</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
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<tr>
<td>IB</td>
<td>50</td>
<td>ZIGZAG IRIS</td>
<td>Iris brevicaulis</td>
<td>1 GAL.</td>
<td>12” O.C.</td>
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<tr>
<td>IF</td>
<td>80</td>
<td>COPPER IRIS</td>
<td>Iris fulva</td>
<td>1 GAL.</td>
<td>12” O.C.</td>
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<tr>
<td>IV</td>
<td>83</td>
<td>SOUTHERN BLUE FLAG</td>
<td>Iris virginica</td>
<td>1 GAL.</td>
<td>12” O.C.</td>
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<tr>
<td>LC</td>
<td>30</td>
<td>CARDINAL FLOWER</td>
<td>Lobelia cardinalis</td>
<td>1 GAL.</td>
<td>18” O.C.</td>
</tr>
<tr>
<td>MC</td>
<td>78</td>
<td>GULF MUHLY</td>
<td>Multienbergia capillaris</td>
<td>3 GAL.</td>
<td>36” O.C.</td>
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<tr>
<td>MCO</td>
<td>71</td>
<td>DWARF WAX MYRTLE</td>
<td>Morulae carthrea 'homa'</td>
<td>5 GAL.</td>
<td>48” O.C.</td>
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<tr>
<td>ML</td>
<td>22</td>
<td>LINDHEIMER'S MUHLY</td>
<td>Multienbergia lindheimeri</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
</tr>
<tr>
<td>MM</td>
<td>1556</td>
<td>BIG-FOOT CLOVER</td>
<td>Morulae macrpopda</td>
<td>PLUGS</td>
<td>6” O.C.</td>
</tr>
<tr>
<td>PI</td>
<td>15</td>
<td>SPRING OBEDIENT PLANT</td>
<td>Physostega intermedia</td>
<td>1 GAL.</td>
<td>24” O.C.</td>
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<tr>
<td>PO</td>
<td>10</td>
<td>MARSH FLEABANE</td>
<td>Pluchea odorata</td>
<td>1 GAL.</td>
<td>36” O.C.</td>
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<tr>
<td>PV</td>
<td>5</td>
<td>FALL OBEDIENT PLANT</td>
<td>Physostega virginiana</td>
<td>1 GAL.</td>
<td>36” O.C.</td>
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<tr>
<td>RA</td>
<td>23</td>
<td>AROMATIC SUMAC</td>
<td>Rhus aromatica</td>
<td>5 GAL.</td>
<td>72” O.C.</td>
</tr>
</tbody>
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### PLANT LEGEND – RILL GARDEN & RAIN PLANTERS

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<thead>
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<th>SYMB.</th>
<th>QTY.</th>
<th>COMMON NAME</th>
<th>SCIENTIFIC NAME</th>
<th>SIZE – REMARKS</th>
<th>SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>38</td>
<td>SPIDER MILKWEED</td>
<td>Asclepias asperula</td>
<td>1 GAL.</td>
<td>15” O.C.</td>
</tr>
<tr>
<td>AF</td>
<td>4</td>
<td>INDIGO BUSH</td>
<td>Amorpha fruticosa</td>
<td>8 GAL.</td>
<td>10” O.C.</td>
</tr>
<tr>
<td>AG</td>
<td>17</td>
<td>BIG BLUESTEM</td>
<td>Andropogon gerardii</td>
<td>5 GAL.</td>
<td>48” O.C.</td>
</tr>
<tr>
<td>AGL</td>
<td>33</td>
<td>BUSHY BLUESTEM</td>
<td>Andropogon glomeratus</td>
<td>5 GAL.</td>
<td>48” O.C.</td>
</tr>
<tr>
<td>AI</td>
<td>9</td>
<td>SWAMP MILKWEED</td>
<td>Asclepias incarnata</td>
<td>1 GAL.</td>
<td>24” O.C.</td>
</tr>
<tr>
<td>AT</td>
<td>30</td>
<td>BUTTERFLY WEED</td>
<td>Asclepias tuberosa</td>
<td>1 GAL.</td>
<td>18” O.C.</td>
</tr>
<tr>
<td>CB</td>
<td>300</td>
<td>CREEK SEDGE</td>
<td>Carex blands</td>
<td>Plugs</td>
<td>6” O.C.</td>
</tr>
<tr>
<td>CL</td>
<td>21</td>
<td>INLAND SEA OATS</td>
<td>Chaenactis itataita</td>
<td>5 GAL.</td>
<td>36” O.C.</td>
</tr>
</tbody>
</table>

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33
UTA Green at College Park Rill Garden

looking North from Marine Creek Parkway

2007: from google maps
UTA Green at College Park Rill Garden
looking North from Marine Creek Parkway

2012: from google maps
UTA Green at College Park Rill Garden
looking North from Marine Creek Parkway

2015: from google maps
UTA Green at College Park Rill Garden

looking North from Marine Creek Parkway

2021: by David Hopman
SUSTAINABLE SITES

UTA Green at College Park
**Location:** Arlington, Texas

**Size:** 2.6 acres / 112,820 ft²

**Type:** Educational / Institutional

**Team:** Schrickel, Rollins and Associates (now Parkhill)  
The University of Texas at Arlington, NCTCOG

Questions/Comments?

David Hopman, ASLA — The University of Texas at Arlington,  
Landscape Architecture Program  
dhopman@uta.edu
LED STREETLIGHT CONVERSION PROJECT

Oscar Valle
Traffic Operations Supervisor
Department of Public Works & Transportation
5,223 Streetlights out of a total of approximately 23K streetlights Citywide remain to be converted to LED.

PROJECT SCOPE

- 5164 Residential Streetlights
- 14 Canopy Lights
- 45 Antique Lights
PROJECT PHASING

Phase I – 2500 Fixtures

- IH-20/Cooper – High Masts with 66 fixtures
  - Estimated completion in Sept. 2020

- IH-20/SH360 High Masts with 18 fixtures
  - Estimated completion in Oct. 2020

- IH-30 High Masts with 216 fixtures
  - Estimated completion in April 2021

- All Residential areas between Park Row Drive and the northern City Limits, including the UTA area, with 2200 fixtures.
  - Estimated completion in April 2021

Total cost to complete LED streetlight conversion $2,464,000 with City crews

Received Arlington Tomorrow Fund Grant in February 2020 for Phase I
PROJECT PHASING

○ Phase II – Approximately 3500 fixtures in FY21
  ○ Between Park Row Drive and Arbrook Blvd.

○ Phase III – Approximately 1400 fixtures in FY22
  ○ Between Pleasant Ridge Road and Sublett Road

○ Phase IV – Approximately 1297 fixtures in FY23
  ○ Between Sublett Road and southern City Limit
ENERGY SAVINGS

- 100W changed to 55 LED saves about $1.56 each light per month
- 100W changed to 94 LED saves about $0.65 each light per month
- 150W changed to 100 LED saves about $2.46 each light per month
LIFE EXPECTANCY OF LED STREETLIGHTS

- Life expectancy for LED fixtures are typically 10 years. There is no bulb for LED’s, the fixture and diode is one complete item.
- Life expectancy for High Pressure Sodium fixtures is only 5 years.
- LED fixture warranty is 10 years
REDUCTION OF LIGHT POLLUTION

- LED fixtures create a white light
- Provides better visibility
- Does not contain toxic chemicals such as mercury
- The light pattern is focused on the roadway with less light pollution and improved color rendering.
Green Transportation Infrastructure Workshop: Solar Lighting

Sandip Sen
Planning Manager – Service Implementation
Shelter Lighting Systems

- Off-grid security illumination for every bus shelter
- 80W solar array, 8W security luminaire
- Optional cellular monitoring and power for digital displays
- UL Listed. Made in the USA.
Why Solar?

For many projects, standalone solar lighting is the ideal option.

- **Fast and easy installation**
  Low cost and minimal site disruption

- **No utility connection required**
  Reduced carbon footprint

- **Highly visible**
  Positions our community as a leader in sustainability

- **Long Lasting**
  Commercial grade solutions that last as long as a bus shelter
Solar Panel Installation

TSSL Installation Manual

1. Roof mounting

2. Peak roof mounting

3. Flat roof mounting

4. Mounting part of the frame using a screw (using the supplied anchors). Do not overtighten.

5. Hanging the housing from the frame with the supplied screws and plug in the TSS cable through the roof.

TRINITY METRO®
How Solar Lighting Works

Solar Panel

ECM Connect™

Battery

Light
Trinity Metro Solar Lighting

- Started installing solar lights in 2010 ( Majority of solar lights installed 2017-2020.)
- 156 standard shelters
- 3 downtown shelters
- New shelters built with solar lights
- Cost savings when done together
Pole-Mounted Lighting Systems

- Easily deployed security lighting and optional digital signage
- Enhance security and reduce pass-bys
- Deploy at any bus stop with a standard transit pole
- UL Listed. Made in the USA.
Contact Information

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