CITY OF MILWAUKEE
FRAMEWORK FOR
GREEN INFRASTRUCTURE PLAN
ECO presented the following Green Infrastructure Plan Framework to the Public Works Committee on September 12, 2018 where it passed. The full Milwaukee Common Council will vote on the proposal September 25, 2018.

Legislation includes:
- A [resolution (CCFN #180527)] in support of this Framework
- An [Ordinance (CCFN #180803)] revisions described herein

ECO expects to complete a final Green Infrastructure Plan document based on this Framework by February, 2019.
WaterCentricCity.org

Showcasing Global Leadership In Managing Our Water Resources
In A Sustainable and Resilient Way
Seven Principles of the Water Centric City
GREEN INFRASTRUCTURE STRATEGIES

BIOSWALEs
Landscape features that capture and infiltrate runoff and can also remove pollutants.

GREEN ROOFS
Partially or completely planted roofs with vegetation growing in soil or other growing media to hold rainwater.

GREENWAYS
Riparian and non-riparian buffer zones and strips that store and drain stormwater runoff into the ground naturally.

NATIVE LANDSCAPING
The use of native plants that can tolerate drought and flooding cycles because of deep roots and climate-specific adaptations.

POROUS PAVEMENT
Pavement that can reduce and infiltrate surface runoff through its permeable surface into a stone or filter media below.

RAIN GARDENS
Gardens that are watered by collected or pooled stormwater runoff, slowly infiltrating it into the ground along root pathways.
GREEN INFRASTRUCTURE STRATEGIES

CISTERNS WITH PUMPS FOR RE-USE
The capture and storage of water, potentially for reuse later.

DEPAVING
Removal of structures or paving in order to allow infiltration.

SOIL AMENDMENTS
Materials worked into the soil to enhance its ability to infiltrate or absorb water.

TREES
Trees that can hold rainwater on their leaves and branches.

WETLANDS
Areas that have soils that are inundated or saturated for part of the year or the entire year.
Green Infrastructure Benefits

- Improves stormwater quality in separated sewer area (TMDLs)
- Reduces risk of Combined Sewer Overflows
- Supports biodiversity
- Improves human health through air/water quality
- Increase property values
- Reduce urban heat island
- Reduce flood risk
- Provides a better learning environment for children
- Climate change adaptation and resiliency
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Too Much Pavement + Increasing Risk of Extreme Storms = Flood Risk

- Flooding in 2010 cost the Milwaukee County and developers at least $37 million dollars in damage.

- Climate change increases the risk of extreme storms.
Climate Change Increases Risk of Extreme Weather
**Green Infrastructure Background**

- **Flooding Study Task Force (2010)** -- Urging a more comprehensive and sustainable stormwater plan to mitigate future stormwater disasters.

- **ReFresh Milwaukee (2012)** – Publicly announcing Milwaukee’s commitment to creating a sustainable, green, and efficient ecocity.

- **Green Street's Stormwater Management Plan (2013)** -- Incorporates GI into street and ally reconstruction program

- **MMSD's Green Infrastructure Plan (2013)** – Recommending green infrastructure strategies and proposing an additional 740 million gallons of stormwater capacity by 2035.

- **Council File 171053 directing ECO to develop a Green Infrastructure Plan** – mandating a green infrastructure plan for Milwaukee’s Combined Sewer Area.

- **ECO consulted with DPW, DCD, DNS, MMSD, utilized interns from UWM-SFS and Marquette Law School’s Water Law and Policy Initiative, and is working with Stormwater Solutions, LLC**
Green Infrastructure

Since 2002

36.0 Million Gallons
GREY TO GREEN:
CITY IS LEADING BY EXAMPLE ON GREEN INFRASTRUCTURE IN OUR REDEVELOPMENT PROJECTS
GREEN LUMINARIES IN PRIVATE DEVELOPMENT

1. December 2017 - Freshwater Plaza
2. June 2017 - Urban Ecology Luminary
3. November 2017 - Ascension Columbia St. Mary’s
GREY TO GREEN:

BUT OPPORTUNITY REMAINS IN OUR PARKING LOTS, ROOFS AND SCHOOL YARDS
GREEN INFRASTRUCTURE AND TREES CAN LEAD TO MORE VIBRANT NEIGHBORHOODS
CONSIDERATIONS FOR GREEN INFRASTRUCTURE PLAN

- Develop policies that substantially add to the amount of visible installed green infrastructure
- Encourage development and investment in the City
- Maneuver within City’s tight financial constraints
EXAMPLE: GREEN INFRASTRUCTURE CAN BE COST EFFECTIVE!

Cost of stormwater components (actual) = $220,000

Maintenance is required but is often “out of sight, out of mind.”
GREEN INFRASTRUCTURE CAN BE COST EFFECTIVE

Alternative: Cost of stormwater components = $180,000 ($40,000 savings!)
RECOMMENDATIONS
OVERVIEW

**Regulatory**
- Require developments to capture the first half inch of runoff when a stormwater management plan is required
- Add climate adaptation and co-benefits of green infrastructure to “Purpose” section of our stormwater management code
- Publicly support MMSD’s new thresholds for green infrastructure

**Economic**
- One-time grants to property owners to implement their green infrastructure
- Partnership with Milwaukee Public Schools to green schoolyards and create new sustainability manager position

**Education and Outreach**
- Outreach to BIDs and Real Estate Groups
- Provide developer education through the Fresh Coast Guardians’ Resource Center
- Review and possibly revise parking lot landscape standards
- Partnership with the Resource Center for expedited and simple review for small GI projects being contemplated by MMSD
We propose to revise City Ordinance Chapter 120 to govern actions that obligate developers to create a stormwater management plans.

1. Add “Climate Adaptation” and “Co-benefits of Green Infrastructure” to “Purpose Section.”

2. Define Green Infrastructure practices; prioritize those with co-benefits.

3. Require that the Stormwater Management Plans use Green Infrastructure to capture at least 1/2” of stormwater using GI.

4. If GI is not feasible on site, City Engineer may consider negotiated solution.
Currently, Milwaukee City Ordinance Chapter 120 governs actions that require developers to create a stormwater management plan; it generally reflects MMSD’s regional requirements.

A stormwater management plan must be created under three circumstances:

1. Development or redevelopment that disturbs one acre (43,560 ft²) or more;

2. Development or redevelopment that disturbs one acre (43,560 ft²) or more over a three year period; or

3. Development or redevelopment increases impervious surfaces by 0.5 acres (21,780 ft²).
City’s Chapter 120 is subordinate to MMSD Chapter 13

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<tr>
<th>MMSD Chap 13</th>
<th>Proposed</th>
<th>Schedule</th>
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<tbody>
<tr>
<td>No Green Infrastructure requirements on development; Stormwater Management plans on development required when: 1. total disturbance on site is greater than 2 acres OR 2. Property adding ½ acre+ of impervious surface</td>
<td>1. Define Green Infrastructure 2. Reduce new impervious surface threshold to 5,000 sq. feet (0.12 acres) – require GI to capture the first half inch 3. No stormwater management plan is required with the new changes</td>
<td>• Introduce at TAT (advisory group of City Engineers) in August 2018 • Seek Approval at MMSD Commission Jan 2019</td>
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<th>City Chap 120 Phase I</th>
<th>Proposed</th>
<th>September 2018</th>
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<td>No mention of Green Infrastructure or requirements for green infrastructure when stormwater management plans are required. Stormwater Management plans on development required when: 1. total disturbance on site is greater than 1 acre OR 2. Property adding ½ acre+ of impervious surface</td>
<td>1. Add co-benefits of visible green infrastructure to “Purpose” section 2. Define acceptable forms of GI 3. When a Stormwater management plan is current required; require use of GI to capture first ½ inch of rain 4. Allow City Engineer to develop alternative solution if this is not technically feasible on a particular site</td>
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<th>City Chap 120 Phase II</th>
<th>Proposed</th>
<th>2019 after adoption of MMSD Chap 13 revisions</th>
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<td>Adopt MMSD’s proposed new thresholds (0.12 acres of new impervious)</td>
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• ECO determined, with input from other departments, that changing the fee structure of Chapter 120 was not a viable incentive for implementing GI.

• A more effective solution is a one time grant to help fund the construction of these GI plans

• We anticipate a significant increase to “Green Solutions” funding from MMSD to support more Green infrastructure projects
ECONOMIC INCENTIVE: FUNDING PRIORITIES FOR GREEN INFRASTRUCTURE

- Green Streets & Alleys
- Schoolyards
- Parking Lots
ECONOMIC INCENTIVE: FUND GREEN SCHOOL YARDS

Up to $600,000 in Green Solutions funding from MMSD through City to support green infrastructure on school yards following the Green Schools Consortium school selection process.

OUTDOOR CLASSROOM AND RECREATIONAL PLAN

Longfellow School Green Infrastructure and outdoor classroom plan
Nature for the Kids

SCHOOLYARD REDEVELOPMENT INTEREST

Longfellow is most interested in providing a safe, healthy, and educational space for their students to learn and explore through creatively designed and inspiring green space.

BETTER ACADEMIC PERFORMANCE

Learning in natural environments can:

- Boost performance in reading, writing, math, science and social studies (1, 2, 3, 4, 5)
- Enhance creativity, critical thinking and problem solving

ENHANCED ATTENTION

Spending time in nature can help children focus their attention:

- FOCUS AND ATTENTION (10, 11, 12, 13)
- ADHD SYMPTOMS (14, 15)

Seeing nature from school buildings can foster academic success (6, 7, 8)

The greener the setting, the better the focus (14, 15)
Green Solutions could provide grants up to $25,000 to commercial and non-profit parking lot owners.

Could be used for any implementation of Green Infrastructure including static projects that do not require a stormwater management plan.

Requires conservation easement.
E D U C A T I O N  A N D  O U T R E A C H

- Outreach to BIDs and Real Estate Groups

- Use MMSD’s Fresh Coast Guardians’ Resource Center to expedite project review