City of Milwaukee
Framework for Green Infrastructure Plan

WATER CENTRIC CITY | ecoCITY of MILWAUKEE

FRESH COAST GUARDIANS

MMSD PARTNERS FOR A CLEANER ENVIRONMENT

Fund for Lake Michigan

Green Infrastructure Plan Legislation

- 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

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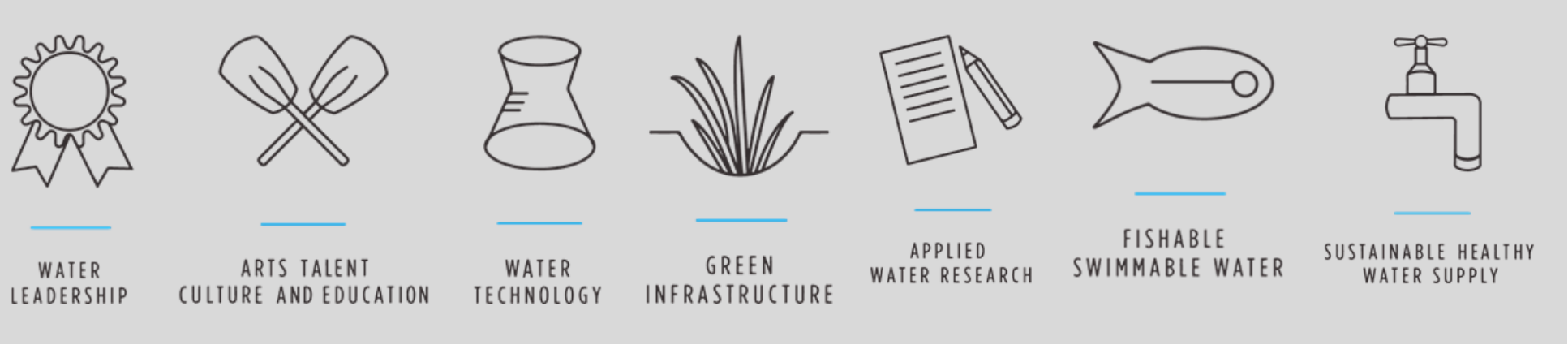

Seven Principles
of the
Water Centric City

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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.

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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.

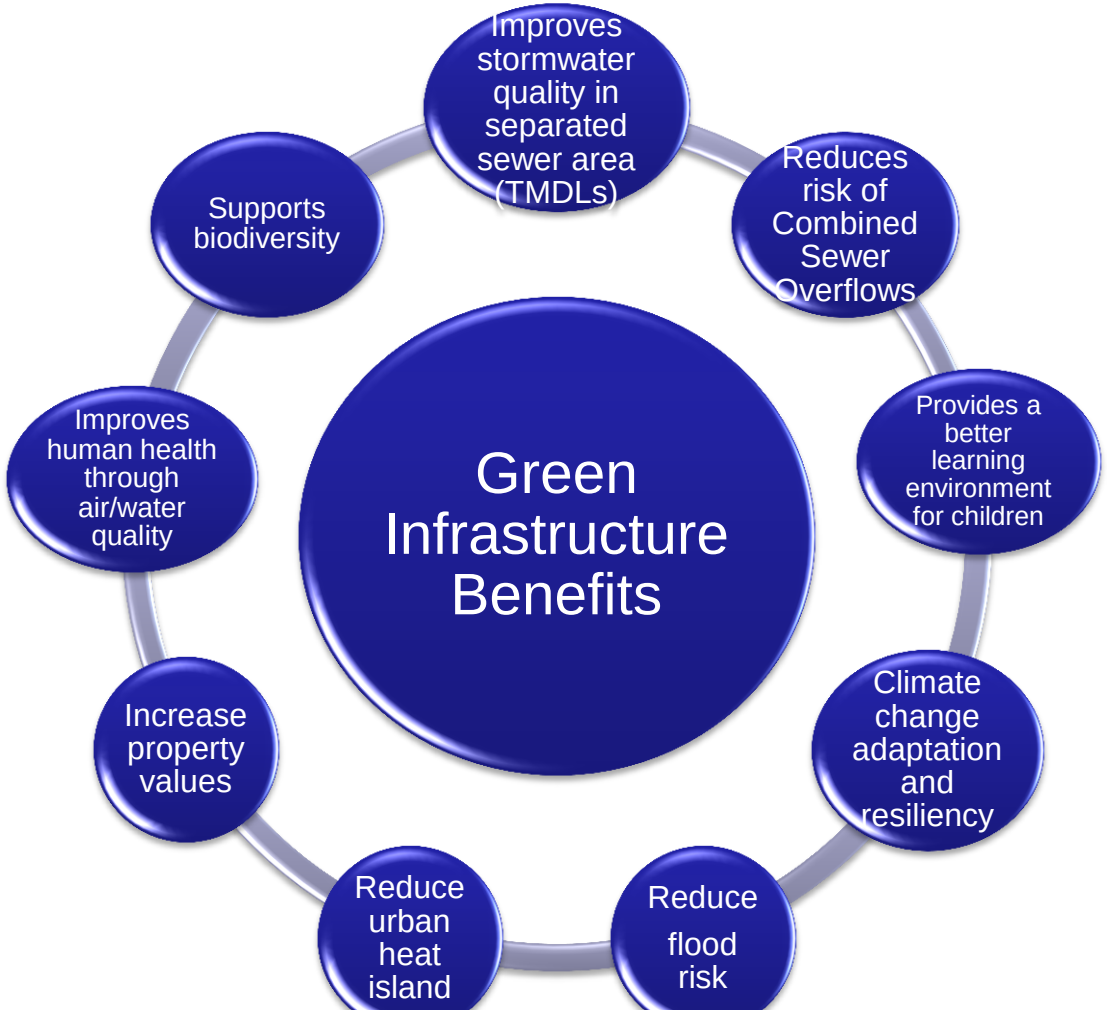
TREES

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.

Co-Benefits of Green Infrastructure



Too Much Pavement + Increasing Risk of Extreme Storms = Flood Risk

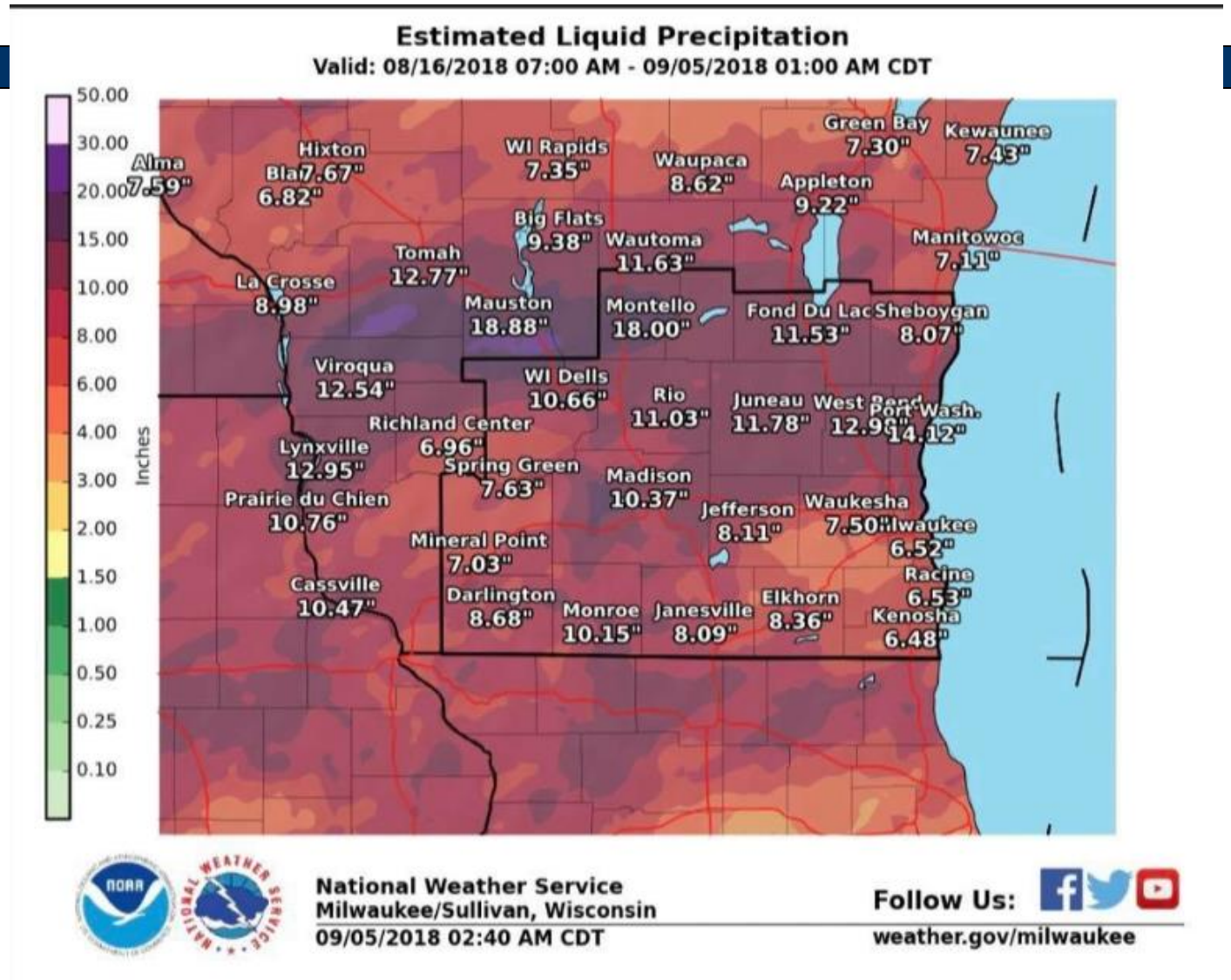
- Flooding in 2010 cost the Milwaukee Count and developers at least $37 million dollars in damage

Bob Dobrogowski and his daughter Rosie look at the collapsed basement of his parents' home during July 2010 flooding in Milwaukee.

Michael Sears/MCT/Landov

- 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

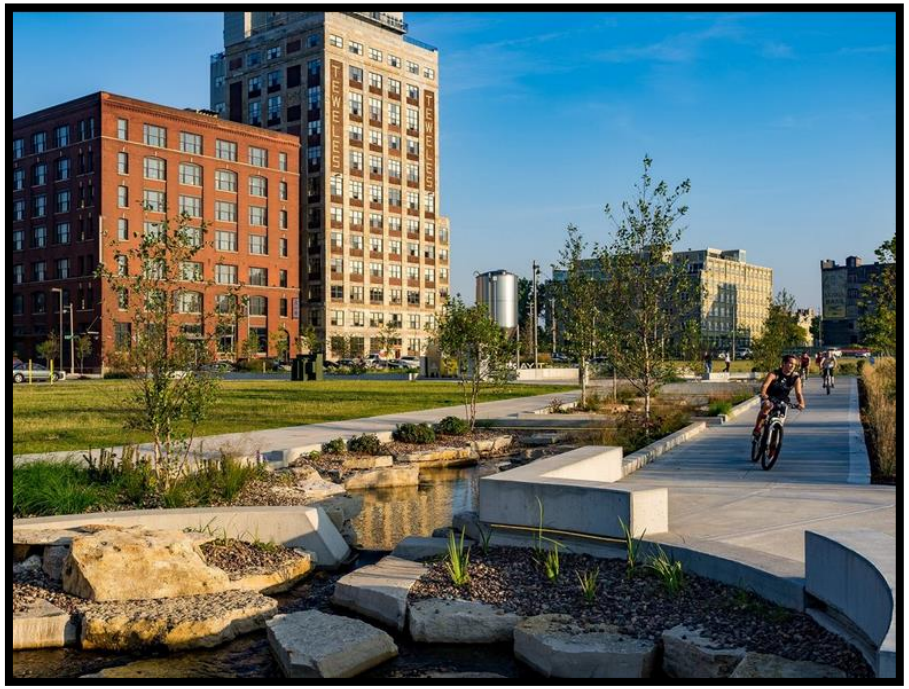
Green Infrastructure

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

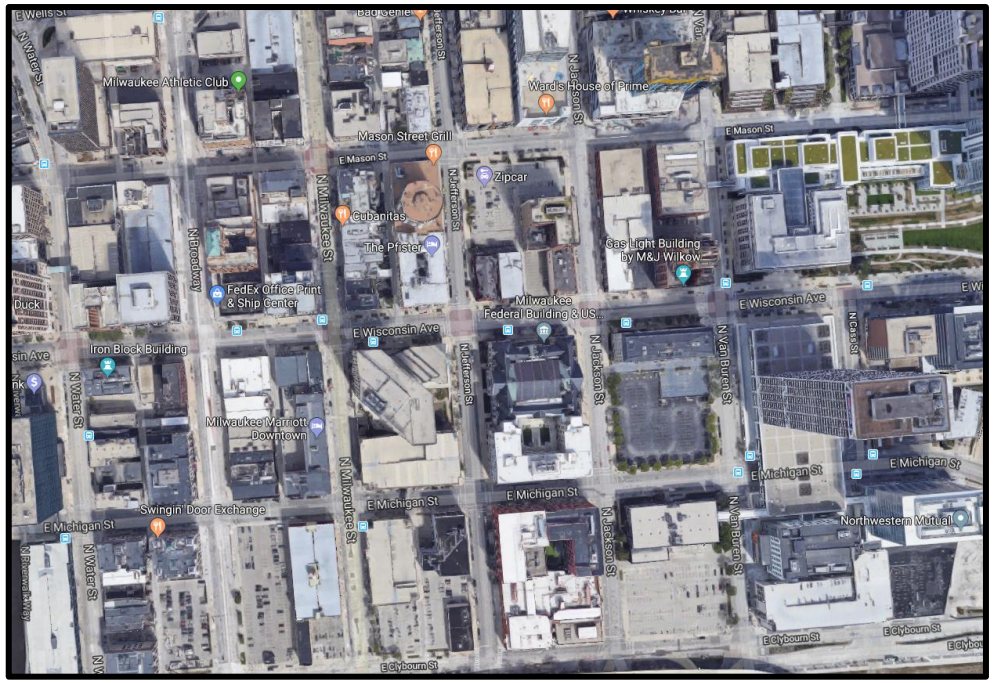
December 2017 - Freshwater Plaza

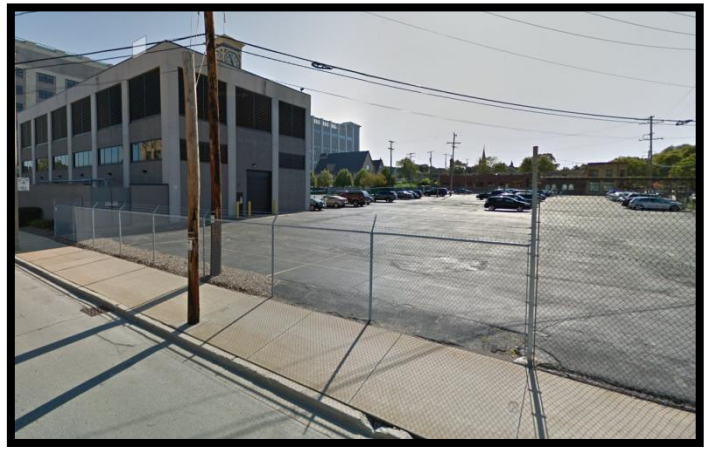
June 2017 - Urban Ecology Luminary

November 2017 - Ascension Columbia St. Mary's

Grey to Green:

But Opportunity Remains in our Parking Lots, roofs and School Yards





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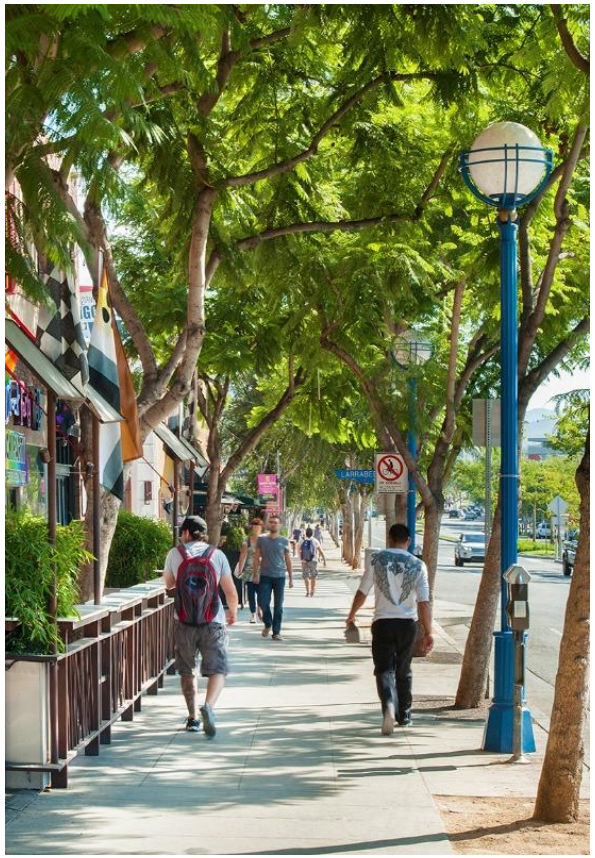
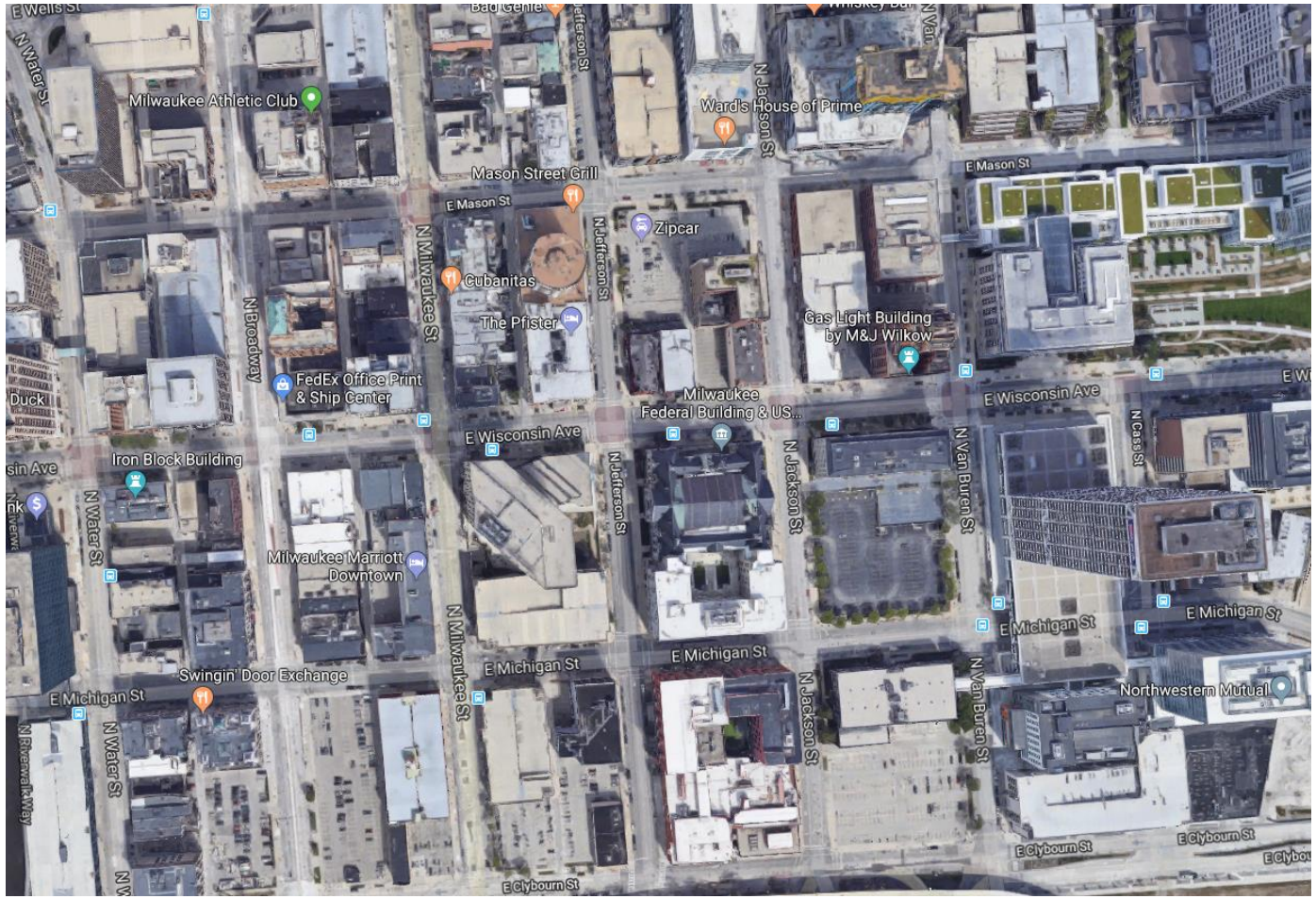
Green Infrastructure and Trees can lead to more vibrant neighborhoods



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!

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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

Greening Stormwater Management Plans

We propose to revise City Ordinance Chapter 120 governs actions that obligate developers to create a stormwater management plans

1. Add “Climate Adaption” 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.

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Regulatory:

When a Stormwater Management Plan is required.

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 ft^2) or more;

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

3. Development or redevelopment increases impervious surfaces by 0.5 acres (21,780 ft^2).

Summary of Proposed Changes

City's Chapter 120 is subordinate to MMSD Chapter 13

	Current	Proposed	Schedule
MMSD Chap 13	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	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	• Introduce at TAT (advisory group of City Engineers) in August 2018 • Seek Approval at MMSD Commission Jan 2019
City Chap 120 Phase I	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 acres OR 2. Property adding ½ acre+ of impervious surface	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	September 2018
City Chap 120 Phase II		Adopt MMSD's proposed new thresholds (0.12 acres of new impervious)	2019 after adoption of MMSD Chap 13 revisions

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Economic Incentive:
No change to the Stormwater Management Fee

- 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

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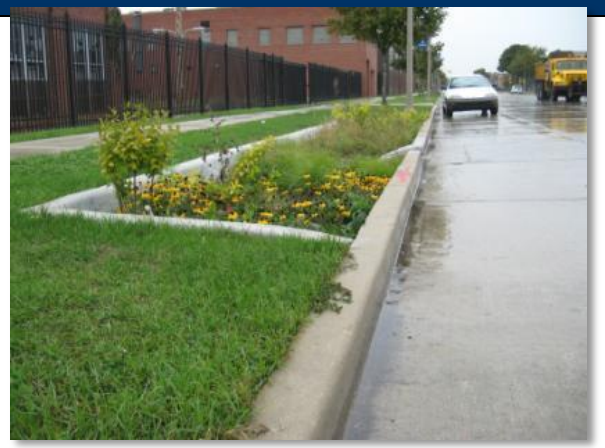
Economic Incentive:

Funding priorities for Green Infrastructure

- Green Streets & Alleys



- Schoolyards

- Parking Lots

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Economic Incentive:

Fund Green School Yards

Longfellow School Green Infrastructure and outdoor classroom plan

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

Reflo Sustainable Water Solutions

MMSD Partners for a Cleaner Environment

Fund for Lake Michigan

MPS Milwaukee Public Schools

Green Schools Consortium of Milwaukee

CDS

Design4Kids intentionally designed natural play spaces

City of Milwaukee

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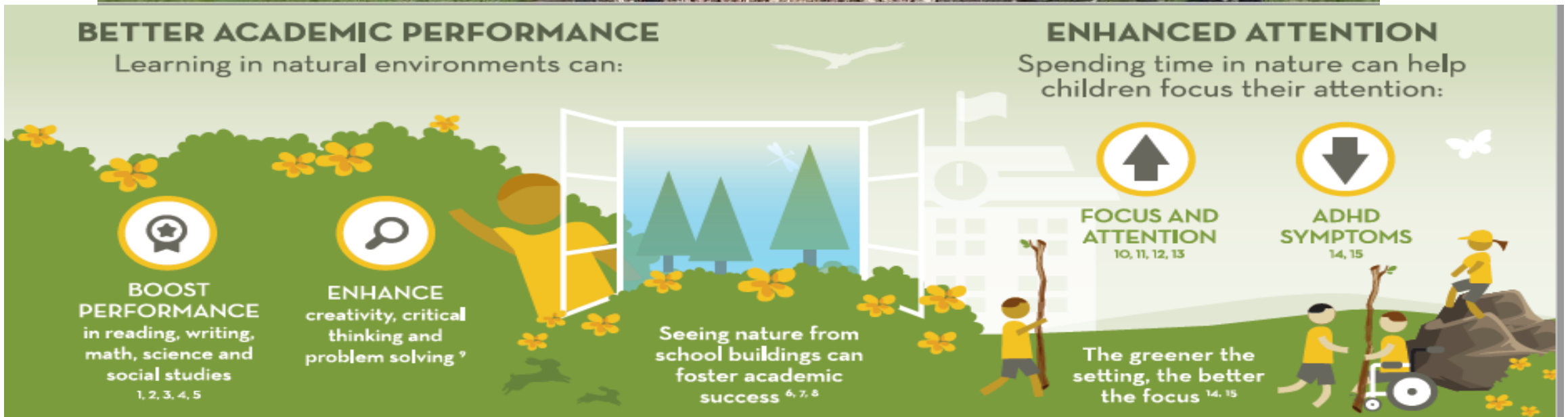
Nature for the Kids



Economic:
Commercial and Non-Profit Property Grants

- 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

SDC lot on 17th North before Green Infrastructure

EDUCATION AND OUTREACH

- Outreach to BIDs and Real Estate Groups

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

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Thanks to our Partners!

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Fund for Lake Michigan

eco ENVIRONMENTAL COLLABORATION OFFICE

ecoCITY of MILWAUKEE

CITY OF MILWAUKEE DEPT. OF PUBLIC WORKS

MMSD PARTNERS FOR A CLEANER ENVIRONMENT

Reflo Sustainable Water Solutions

UNIVERSITY of WISCONSIN UWMILWAUKEE SCHOOL OF FRESHWATERSCIENCES

STORMWATER SOLUTIONS ENGINEERING LLC

MARQUETTE UNIVERSITY LAW SCHOOL