CLIMATE STEWARDSHIP INITIATIVE AND GREEN INFRASTRUCTURE

City of Hartford
Office of Sustainability
TODAY’S PRESENTATION

Climate Stewardship Initiative
- Climate Action Plan: What we do, and how
- Working Together: Our Team and Stakeholders

Background
- Climate Change
- Context in Hartford
- What is Green Infrastructure?

Our Approach
- Research
- Policy
- Community Action
- Next Steps
CLIMATE STEWARDSHIP INITIATIVE

Hartford Climate Action Plan
Adopted January 2018
Environmental Work as a Catalyst for...

- Increased Economic Development
- Public Health Improvements
- Social Equity
VISION SUMMARY

We have developed an overall statement of our shared vision for each of the 6 action areas. This language will be repeated on the first page of each section for the 6 action areas.

**ENERGY**
Cleaner, cheaper, and more reliable energy that reduces the likelihood of power outages during storms, creates green jobs, reduces fossil fuel dependence, and cuts energy costs for all.

**FOOD**
Nutritious food that is locally grown or non-carbon-intensive, and is readily available across all neighborhoods, leading to improved health and greater resiliency for area families.

**LANDSCAPE**
Private and public landscapes filled with trees and meadows that together mitigate the effect of high heat days and flooding, provide ecosystem services, offer recreation, and clean our air.

**TRANSPORTATION**
A multi-modal, affordable transportation network with safe biking and walking options and fewer vehicle-related emissions, which improves air quality and cuts asthma rates.

**WASTE**
Eradication of the worst trash and blight, and public education that boosts diversion, recycling and reuse rates—which in turn cuts costs, related emissions, and environmental degradation.

**WATER**
More efficient use of potable water, better protection against floods and droughts, and waterways made cleaner through green infrastructure that reduces and cleans stormwater runoff.
Working Together
BACKGROUND

- Climate Change
- Context in Hartford
- What is Green Infrastructure?
In CT, “Flooding is likely to be worse during winter and spring, and droughts worse during summer and fall.” ~EPA, 2016
IMPACTS OF CLIMATE ON TREES

Decayed Oak (Goodwin Park)
Oak failure due to drought (North End)
Tree structurally weakened from drought, failed by heavy snow/wind (Simpson St.)
Norway Maple blown over by a recent nor’easter (Sterling St.)
Failing Sugar Maple (Old North Cemetery)
HARTFORD’S IMPERVIOUS COVER

- Degradation of water quality when IC ≥ 12%
- Impervious Cover over 12%: 80%
- Total Impervious Area Citywide: ~5,000 acres
- More Impervious Area → More stormwater runoff and increased Urban Heat Island Effect
NEGATIVE IMPACTS OF STORMWATER

• Increased frequency and risk of localized flooding
• 50 Combined Sewer Overflow (CSO) events every year
• CSO: stormwater/sewage discharge into local water bodies
• 76 Sewer Backups from Jan 2009 to July 2012
• 90% of the pollutant load is within the first inch of rain

Sources: MDC; CT DEEP; EPA; Photo Sources starting clockwise from the top left corner: Green Cities, Blue Waters; WFSB; RestorationEze; Hartford Patch [Tim Jensen]
Historic River Surges @ Bulkeley Bridge

Map from the National Oceanic and Atmospheric Administration “Sea Level Rise Viewer”
IMPAIRED WATER BODIES

- The following receiving waterbodies are on the state 303(d) list:
  - Connecticut River
  - Park River
  - North Branch Park River
  - South Branch Park River

- Other impaired water bodies:
  - Folly Brook
  - Kane Brook
  - Wethersfield Cove

- All are affected by CSOs/bacteria

Source: MDC; Map: UConn CT ECO
SOLUTION: GREEN INFRASTRUCTURE

“Green infrastructure reduces and treats stormwater at its source while delivering environmental, social, and economic benefits” – EPA

Benefits:
- Groundwater Recharge
- Runoff Capture
  - Fewer sewer overflows
  - Less erosion
  - Reduced severity of flooding
- Improved Water Quality
- Improved Air Quality
- Reduced Urban Heat Island Effect
- Public Green Space

Sources: EPA, MDC; Photo: Suisman Urban Design
TYPES OF LID/GI

Connecticut Science Center Green Roof

Bioswale at UConn Law

Urban Tree Canopy – Bushnell Park

Rain Garden at Keney Park

Permeable Pavement (asphalt) at the Capitol
# Urban Tree Canopy, Hartford's Most Valuable Green Infrastructure

## Stormwater Runoff
- **PROBLEMS:**
  - ½ billion gallons of sewage-stormwater mix in local waters
  - 50 Combined Sewer Overflows (CSO) a year (¼” of rain trigger)

- **Hartford’s trees:**
  Intercept 590 million gallons of rain ($4.7 million in runoff reduction services)

## Urban Heat Island
- **PROBLEMS:**
  - Urban areas can be 22°F warmer than less paved areas
  - Hartford’s extended heat event deaths will increase from 27 to 40 deaths in 2055 (+48%)

- **Hartford’s trees:**
  Provide shade and evapotranspiration (respectively cooling by 20-45°F and 2–9°F).

## Air Quality
- **PROBLEMS:**
  - Highest Asthma Emergency Department Visit Rates in CT
  - $16.9 million in asthma hospital costs (2014)

- **Hartford’s trees:**
  Capture pollutants such as particulate matter (a major asthma trigger). Annually, they removed 15,190 lbs of PM.

Sources: Clean Water Project, American Forests, NRDC, DEEP
GREEN INFRASTRUCTURE AND THE CLIMATE ACTION PLAN

- Hartford’s Climate Stewardship Council approved a Climate Action Plan committed to climate resilience
- Green infrastructure is a way to mitigate landscape and water concerns

GOAL 1: Reduce Discharge Into Sewers and Waterways

To have a healthy city, we must have clean waterways. Unfortunately, Hartford has a combined sewer system, which collects and conveys sewage, industrial wastewater, and rainwater runoff in one pipe for treatment and discharge into the Connecticut River. During times of heavy rainfall, this system overflows and discharges untreated water into the River. The Park River alone sees 2,000 gallons of raw sewage annually.

To reduce pollution in our waterways, we must divert stormwater, so that we do not have overflow events. One excellent strategy is “green infrastructure,” which is a natural approach to stormwater management that helps to filter and divert runoff before it enters the sewer system. Green infrastructure integrates vegetation and soils in architecture and landscaping. Examples of green infrastructure in the city include the green roof at the Connecticut Science Center, bioswales along the Connecticut River and at the UConn Law School campus, and permeable asphalt around the State Capitol building.

The City already promotes green infrastructure, through a dedicated team in the Mayor’s office, support from the EPA, and new zoning regulations. But more can be done.

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<tr>
<th>STRATEGY</th>
<th>TYPE</th>
<th>PURPOSE</th>
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<tbody>
<tr>
<td>a. Inventory Potential for Green Infrastructure to Capture Runoff</td>
<td>Inventory/Assess</td>
<td>Assess how much runoff can be captured citywide.</td>
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<td>b. Develop Green Infrastructure Specifications</td>
<td>Policy/Code</td>
<td>Create guidelines for public and private parties to use to develop green infrastructure.</td>
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<td>c. Evaluate and Pursue Stable, Innovative Funding for Green Infrastructure</td>
<td>Incentive</td>
<td>Promote green infrastructure financing.</td>
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<td>d. Support Separation of Combined Sewer System</td>
<td>Partnership/Advocacy</td>
<td>Reduce the frequency of combined sewage overflow events.</td>
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<td>e. Advocate for Green Infrastructure to be Incorporated into Long Term Control Plans</td>
<td>Partnership/Advocacy</td>
<td>Ensure green infrastructure is considered in future strategy by State in managing runoff close to source.</td>
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APPROACH

- Research
- Policy
- Community Action
RESEARCH

2017 CIRCA Green Infrastructure Workshop in New Haven
TECHNICAL ASSISTANCE

- Research
- Topic memos/testimony
- Tree characteristics and benefits

- Analysis
- Mapping
- Runoff calculator
- Canopy cover

- Communications:
  - Design
  - Online platforms
  - Direct Outreach
ZONE
HARTFORD
Zoning Regulations
SYSTEMATIC CHANGES

- Best Management Practices Guide
- Staff Stormwater Workshop
- Zoning Code
  - No Net Increase in Stormwater Runoff
  - Stormwater Fee-in-Lieu
  - Removal of Parking Minimums
  - Consideration for Green Roofs
- Preferred Tree Species List
KNOX and The Hartford volunteers plant 36 trees on Arbor Day 2018

Community Action Meeting on Landscape and Water
RETAIN THE RAIN
STORMWATER MANAGEMENT PILOT
HOW WE GAIN FROM THE RAIN

- Help prevent sewage backups
- Help reduce pollution like motor oil and heavy metals
- Water your lawns and gardens at no cost
- Recharge the city’s groundwater supplies
- Help prevent sewage overflows into rivers

Did You Know?

- 1/4”
  It can take as little as a 1/4 inch of rain to cause combined sewer overflows
- 50
  Combined Sewer Overflows enter our waters every year
- 1/2
  BILLION GALLONS of sewage/stormwater mix is discharged into our rivers

Source: MDC, Clean Water Project
OUR PROGRAM:
SAVE WATER AND THE ENVIRONMENT!

Source: Creek Smart
Images: The Home Depot
COMMUNITY OUTREACH

- Workshop
- Neighborhood Presentations
- Community Action Meeting

Workshop at Keney Park
FUTURE PLANS

Opportunities

Next Steps
Thank you questions?