

Funding and Financing

Strategies for Integrated Hazard Mitigation and Water Resource Plans

MONDAY, DECEMBER 16, 2024

NATALIA SANCHEZ



ENVIRONMENTAL
FINANCE CENTER

AGENDA

Overview of the Planning Process

Incorporating Finance into Integrated Plans

Developing a Balanced Funding and Finance Strategy

- Cost reducers
- Revenue streams

Case Studies



BENEFITS OF INTEGRATED HAZARD MITIGATION AND WATER RESOURCE PLANNING

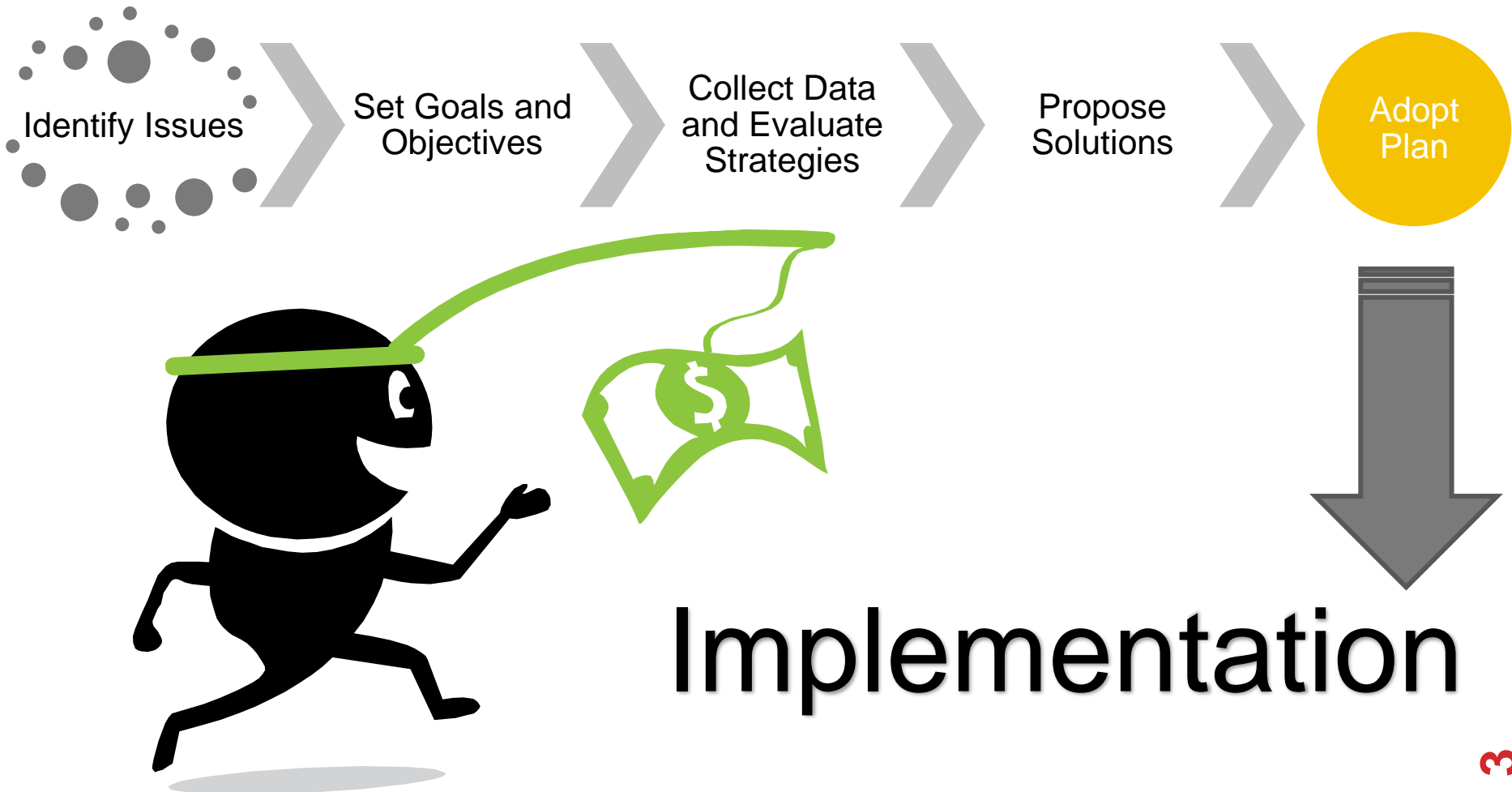
Community benefits:

- Streamline community priorities
- Create support for a broader range of actions
- Minimize hazard impacts
- Improve the natural environment
- Efficiently address water quality mandates
- Increase community resilience

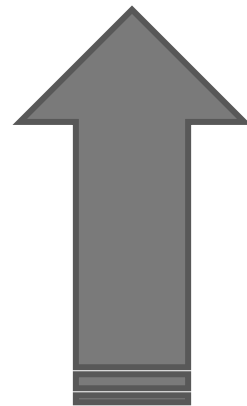
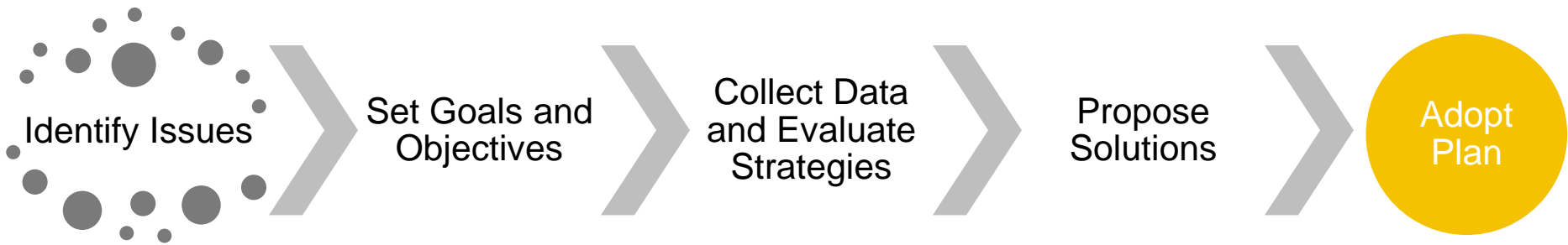
Financial benefits:

- Streamline resource allocation
- Coordinate available project funding
- Leverage different funding sources
- Scale projects
- Potentially shift from funding to financing

TYPICAL PLANNING PROCESS



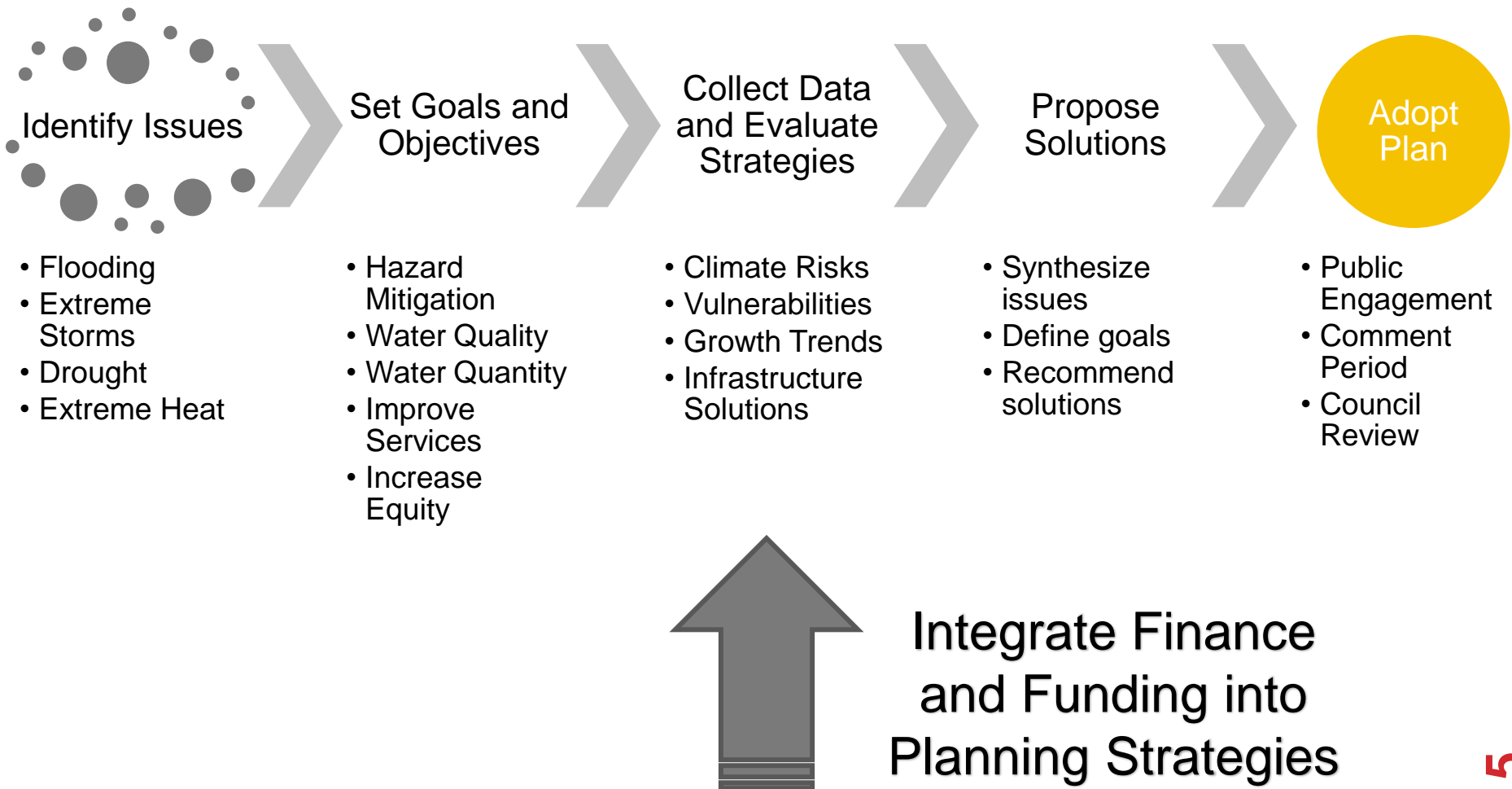
RECOMMENDED PLANNING PROCESS



Implementation

PLANNING PROCESS

INTEGRATED HAZARD MITIGATION AND WATER RESOURCE PLANNING



INCORPORATING FINANCE INTO INTEGRATED PLANS

Step 1: Identify costs and develop a budget

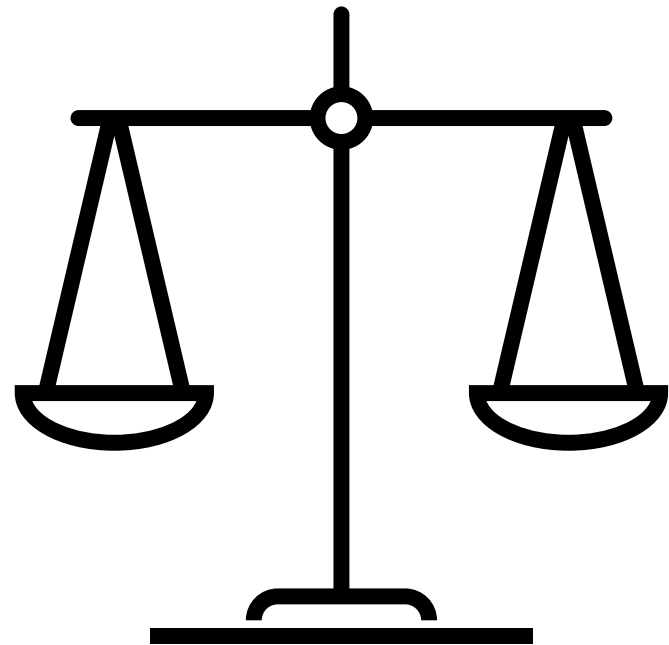
- Identify overlapping strategies and interventions
- Consider the types of costs for each planned intervention
 - Capital
 - Labor
 - Operations and maintenance
- Develop a comprehensive budget and well long-term budget projections



INCORPORATING FINANCE INTO INTEGRATED PLANS

Step 2: Identify benefits in your plan and conduct a benefit-cost analysis

- Assess qualitative and quantitative benefits of strategies
- Consider potential funder guidelines for benefit valuation
- Compare future project benefits to implementation costs
- Consider doing a “total cost benefit analysis”

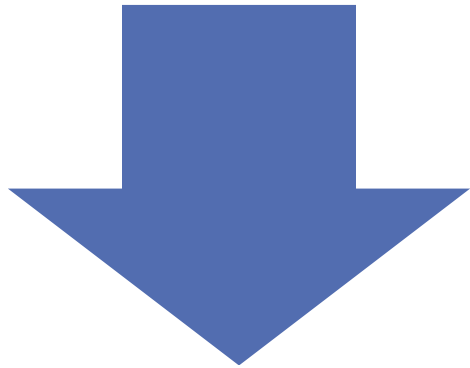


INCORPORATING FINANCE INTO INTEGRATED PLANS

Step 3: Prepare and incorporate funding strategy in the plan

- Consider a variety of funding and financing strategies
- Understand how funding sources can, and cannot, be combined
 - Understand the alternatives available to your community for cost share under “2 CFR § 200.306 - Cost sharing or matching” and be aware of requirements such as documentation of the match.
- Identify available clearinghouses for your state’s grants and loans
- Identify potential funding gaps

DEVELOPING A BALANCED STRATEGY FUNDING AND FINANCE



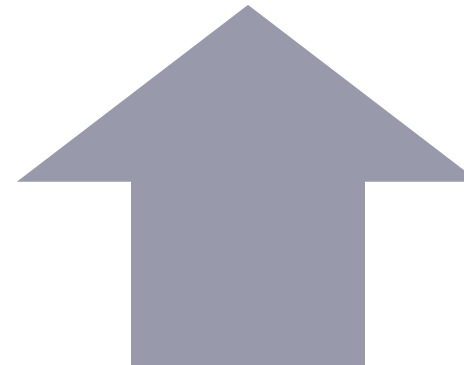
Financing

- “two-way” acquisition of money
- Repayment of principal and interest



Funding

- “one-way” financial resource
- No repayment



DEVELOPING A BALANCED STRATEGY COST REDUCERS AND REVENUE STREAMS



Cost Reducers

- Comprehensive Planning
- Capital Improvement Programs
- Procurement Partnerships and Resource Sharing
- Public Private Partnerships
- Rebates and Tax Credits
- Regulations and Policy

Revenue Streams

- Taxes
- Fees
- Bonds and Loans
- Grants
- Crowdfunding
- Offsite Crediting Programs

COST REDUCERS

Strategies to increase a program's efficiency and reduce its overall costs.

COST REDUCERS

COMPREHENSIVE PLANNING

Benefits

- Helps to identify priorities
- Codifies community's long-term commitment
- Establishes strategy for achieving goals
- Provides an opportunity to engage community stakeholders
- Coordinates departmental efforts

Challenges

- Requires advanced coordination and commitment from leadership
- Does not provide direct revenue for implementation
- May require state enabling legislation

Ideal Use

- Setting broad goals
- Outlining commitment to integrated hazard and water management
- Identifying cross departmental co-benefit strategies

COST REDUCERS

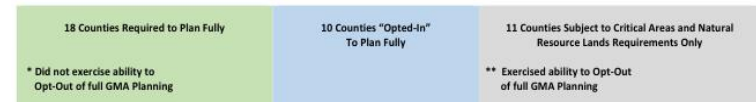
COMPREHENSIVE PLANNING

Washington 1990 Growth Management Act (GMA)

- Cities and counties must develop a comprehensive plan to manage growth
- Land use elements in the plan set the direction of future growth

Maryland 1997 Smart Growth Legislation

- Focused on incentives rather than regulations
- Encourages investment in urbanized areas and the preservation of open space



Source: Washington State's Department of Commerce, updated 2017



Source: Moeckel, R., & Lewis, R. (2017). Two decades of smart growth in Maryland (U.S.A): impact assessment and future directions of a national leader. *Urban, Planning and Transport Research*, 5(1), 22–37. <https://doi.org/10.1080/21650020.2017.1304240>

COST REDUCERS

CAPITAL IMPROVEMENT PROGRAM

Benefits

- Aligns community priorities with long-term capital funding plan
- Increases efficiency
- Provides cost benefits
- Incorporates GI into other projects such as utilities, schools and parks
- Establishes criteria for CIP project funding that prioritizes hazard mitigation and water resources

Challenges

- Requires more coordination and collaboration among departments
- May require training government leaders and staff to think about integrating hazard mitigation into other local planning

Ideal Use

- Setting specific requirements for capital improvements
- Identifying projects with multiple co-benefits
- Coordinating project outcomes across departments

COST REDUCERS

CAPITAL IMPROVEMENT PROGRAM

Prince George's County, MD

County ordinance incorporates environmental site design into road, trail, sidewalk, and transit projects to ensure that stormwater runoff is well-managed and that they are safe for all users (Complete Streets)

State of Vermont

Municipal planning and capital improvements incorporate the use of a river corridor tool and a road infrastructure tool designed to identify sites most vulnerable to flood damage



Green street design for Capitol Heights
Source: Capitol Heights Green Streets Master Plan

COST REDUCERS

COOPERATIVE PROCUREMENT AND INTER-LOCAL RESOURCE SHARING

- **Minnesota Watershed Districts**
 - Holistic approach to water protection using watersheds as planning boundaries
 - Watershed districts have provided cost-share funding to cities, counties and other entities for stormwater management practices



Planned rain gardens in neighborhood of Rice Creek Watershed District
Source: SE White Bear Retrofit Analysis

Benefits

- Reduced costs for goods or services
- Reduced administrative burden
- Exchange and share resources and technical information

Challenges

- Legal compliance concerns when working with multiple entities
- May contradict “Buy local” policies
- Identifying an appropriate lead
- Aligning procurement values
- Limits competition

Ideal Use

- General and reoccurring needs such as office supplies, fuel, and technical services
- Aggregating shared service needs and purchasing preferences across jurisdictions
- Equipment or facility needs shared by neighboring jurisdictions

COST REDUCERS

PUBLIC PRIVATE PARTNERSHIPS

Benefits

- Leverages public capital to incentivize private investment
- Shared risk between public and private sector
- Shared responsibility can increase project efficiencies
- Potential cost and time savings

Challenges

- Rigorous request for proposal process can limit opportunities for smaller firms
- Requires large-scale projects
- Perceived or actual loss of public control
- Long-term deals can constrain policymaking options for decades
- Requires commitment to monitoring and evaluation
- Benefits are highly speculative

Ideal Use

- Large-scale infrastructure or operation and maintenance projects
- Project should have limited and quantifiable risk
- Projects with a realistic chance for a positive revenue stream
- Projects with well-defined shared vision of what success looks like
- Projects that are complex or require innovative technology solutions

COST REDUCERS

PUBLIC PRIVATE PARTNERSHIPS

Clean Water Partnership, Prince George's County, MD

- CBP3 between Prince George's County MD and Corvias Solutions
- Designed to address investment in stormwater management, as well as community and workforce development
- Stormwater utility fees fund multi-year agreement with Corvias Solutions to manage the County's infrastructure investments

Highlights from 2019 Report

Prince George's County, MD and Corvias Complete Stormwater Partnership Ahead of Schedule, Under Budget



Source: The Clean Water Partnership

COST REDUCERS

INCENTIVES - REBATES AND TAX CREDITS

Benefits

- Way to incentivize the purchase of new technology, service, or practice
- Speaks to businesses and individuals self-interest
- More politically feasible than increasing taxes
- Leverages private investment to achieve community goals

Challenges

- One-time funds related to specific purchases
- Typically offsets only a portion of the cost
- Difficult to determine additionality

Ideal Use

- Encourage, limit, or manage growth
- Promote a specific technology or practice
- Part of a coordinated outreach strategy to mobilize resident action

COST REDUCERS

INCENTIVES - REBATES AND TAX CREDITS

- **West Chester, PA**
 - Stream Protection Fee
 - Incentives (credits and rebates) for property owners who install and maintain stormwater management practices on their properties
- **Anne Arundel County, MD**
 - Stormwater Remediation Fee and a Stormwater Property Tax
 - Property owners receive credits towards both if they implement practices on their properties
- **The Community Rating System (CRS) of FEMA's National Flood Insurance Program (NFIP)**
 - Residents obtain increased discounts on their flood insurance premiums based on the increased amount of hazard mitigation activities they implement

COST REDUCERS

REGULATIONS AND POLICY

Benefits

- Embed goals into new projects
- Minimize maintenance cost to the municipality
- Puts benefit and costs onto the developer
- Environmental and societal benefits as a result of improvements

Challenges

- Local regulatory approach preferences
- Maintaining updated and adaptable requirements
- Staff capacity and knowledge
- Public awareness and enforcement
- May require state enabling legislation

Ideal Use

- Encourage, limit, or manage growth
- Require specific standards
- Engage private sector

COST REDUCERS

REGULATIONS AND POLICY

- **Montgomery County, MD**
 - Tree Canopy Law - Permit applicants must satisfy mitigation requirements based on the area within the limits of disturbance
 - Planting trees on the property OR
 - Paying fee-in-lieu into a dedicated account.
 - Roadside Tree Protection Law - Permit applicants must have an approved plan to protect critical root zones of roadside trees and, if a tree is removed
 - Plant one replacement roadside tree at or near the location of the removed tree AND
 - Pay for two additional roadside trees.

REVENUE STREAMS

Mechanisms to generate and access capital for project implementation.

REVENUE STREAMS

TAXES, ASSESSMENTS, AND SPECIAL DISTRICTS

- **General Funds**
- **New taxes or special assessments**
 - Enterprise funds
- **Tax Increment Financing Districts or Special Improvement Districts**

Benefits

- Taxes are consistent from year-to-year and use an existing funding system
- Taxes can be earmarked for a specific service provided

Challenges

- Taxes can be unpopular and revenue generated is typically not allocated to a specific cause
- Some general taxes may impose a larger cost burden on low-income people

Ideal Use

- Operations and Maintenance
- On-going programs
- Small infrastructure projects
- Limited access to debt

REVENUE STREAMS

TAXES, ASSESSMENTS, AND SPECIAL DISTRICTS

- **Fairfax County, VA**
 - Implemented a stormwater tax in 2010 which assessed 1 cent per \$100 of property value on properties within a designated assessment district
 - The tax is currently assessed at 3.25 cents per \$100 of assessed real estate value



Restored streambed in Fairfax Co
Source: Fairfax Co Govt

REVENUE STREAMS

FEES

- **Permit Fees**
- **Utility Fees**
- **Impact Fees**
- **Fee In-lieu**

Benefits

- Fees are allocated to a specific service provided
- Fees are often easier to adopt than taxes
- Can help support projects with on-going maintenance needs

Challenges

- Fees may not generate sufficient funds and require administrative capacity for assessing and collecting

Ideal Use

- Discrete use case
- Project provides a direct community service

REVENUE STREAMS FEES

- **Northampton, MA**
 - Stormwater and Flood Control Utility in 2014 supported by a new fee
 - Fee is based on average runoff for single-family, two-family and three-family homes
- **Missouri**
 - Funds stream restoration projects with a mitigation requirement for developers that impact streams



REVENUE STREAMS

DEBT- BONDS AND LOANS

- **Bonds**

- Municipal
- Green
- Impact

- **State Revolving Funds**

Benefits

- Can support large-scale shovel-ready projects
- Provides a steady funding stream over time that can help smooth out expenses and create a more predictable cash flow
- Low-interest financing
- Allows you to save time and build capital projects sooner by borrowing up-front

Challenges

- Requires full repayment plus interest
- May require voter approval
- Contingent on credit record
- Limited in scope, typically on suitable for large-scale shovel-ready infrastructure projects
- Can require capacity for meeting reporting requirements
- Increased risk as future revenues may change

Ideal Use

- Large-Scale Shovel-Ready Projects
- Infrastructure Projects With A Revenue Stream
- Municipalities with Good Credit

REVENUE STREAMS

DEBT – BONDS AND LOANS

Virginia Clean Water State Revolving Loan Fund (2019)

- \$20 million in funding
- Purchase and protection of 22,856 acres in Southwest Virginia



REVENUE STREAMS

GRANTS

- **Federal**
- **State**
- **Regional**
- **Local**
- **Foundations**
 - Private
 - Nonprofit
 - Community

Benefits

- Does not require repayment
- Widely available for various projects

Challenges

- Competitive and limited in availability
- Often project specific and time-constrained
- Can require match and capacity for meeting reporting requirements

Ideal Use

- Discrete mid-to-small projects
- Pilot projects
- As part of a larger capital stack
- Outreach and education projects

REVENUE STREAMS GRANTS

Overview of Federal Funding and Technical Assistance Programs								
	Green Infrastructure	Natural Infrastructure	Urban Focus	Habitat Restoration	Flood Prevention	Water Quality	Pollution Abatement	Disaster Mitigation
EPA Building Blocks for Sustainable Communities								
EPA Clean Water Act Nonpoint Source Grant (Section 319)								
EPA Clean Water State Revolving Fund (CWSRF)								
EPA Great Lakes Restoration Initiative (GLRI)								
EPA Greening America's Communities Program								
EPA Superfund Redevelopment Initiative (SRI)								
EPA Urban Waters Small Grants Program (UWSG)								
FEMA Flood Mitigation Assistance (FMA) Grant								
FEMA Pre-Disaster Mitigation (PDM) Grant Program								
HUD Community Development Block Grant (CDBG)								
NOAA Community-based Restoration Program								
USDA Urban and Community Forestry (UCF) Program								
USFWS (U.S. Fish & Wildlife Service) Coastal Program								



FEMA

HUD

DOT / FHWA

NOAA

EPA

USDA / RD + NRCS + US Forest Service

DOI / USFWS

DOD

USACE

(NFWF)

REVENUE STREAMS

FEDERAL GRANTS

**Federal Funding and
Technical Assistance
Programs**

CASE STUDIES

Water utilities using robust planning strategies and combining multiple finance and funding sources.

SOUTH MONMOUTH REGIONAL SEWER AUTHORITY NEW JERSEY

Problem:

SMRSA operates a sewage treatment plant and a conveyance system servicing eight coastal municipalities that have recently experienced extreme weather events.



SOUTH MONMOUTH REGIONAL SEWER AUTHORITY NEW JERSEY

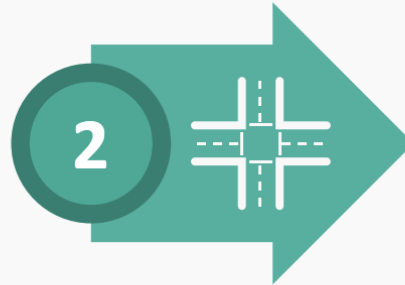
Solutions Identified in the Planning Process:

Focus on implementing resiliency measures at pump stations.
Retrofitted four pump stations: Belmar Pump Station, Pitney Avenue Pump Station, Lake Como Pump Station, Penn Avenue.



Raise

Raise equipment in the building to 4ft above the 500 year flood elevation



Relocate

Rebuild Pump Station outside of flood zone



Rapid Response / Recovery

A mobile enclosure that protects critical pump station components that can be relocated before a storm

SOUTH MONMOUTH REGIONAL SEWER AUTHORITY NEW JERSEY

Belmar Pump Station

Adaptive Measures Installed:

- Mobile Pump Station
- All electrical equipment above 500-year flood elevation
- Submersible pumps

Belmar Pump Station: State Funded

CW SRF	\$2,800,000	100%
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Qualified for \$528,884 in loan forgiveness

Pitney Ave Pump Station

Adaptive Measures Installed:

- Mobile Pump Station
- All electrical equipment above 500-year flood elevation

Pitney Ave Pump Station: Mixed Sources

FEMA	\$1,377,000	90%
CW SRF	\$153,000	10%

SOUTH MONMOUTH REGIONAL SEWER AUTHORITY NEW JERSEY

Lake Como Pump Station

Adaptive Measures Installed:

- Relocate building
- Extend force main and sewer line

Penn Station Pump Station

Adaptive Measures Installed:

- Raised all electrical equipment above 500-year flood elevation

Lake Como: Mixed Sources

FEMA	\$2,214,000	90%
CW SRF	\$ 246,000	10%

Penn Station: Authority Reserves

Authority Reserves	\$2,400,000	100%
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STATEWIDE HAZARD MITIGATION EFFORT VERMONT

Problem

- Hurricane Irene in 2011

Solution

- 2012 started a buyout effort to purchase flood damaged and flood vulnerable
 - Acquire and demolish close to 160 flood-vulnerable properties and complete approximately 70 infrastructure improvement projects
- 2019 Vermont State Hazard Mitigation Plan (SHMP) that emphasizes floodplain restoration.
 - Conserve critical areas and watershed functions so water can spread out to low-lying areas after heavy rainfall events



Greenway Trail Bridge in Cambridge, VT

(Photo source: Seth Jensen, LCPC featured in the Vermont State Hazard Mitigation Plan – 2018)

STATEWIDE HAZARD MITIGATION EFFORT VERMONT

Cost Reducers

- Community planning integrates hazard mitigation and water resource management
- Development regulations
- Incentivizing and promoting residential participation

Revenue Streams

- Federal and state programs, to include FEMA, Vermont Housing Conservation Board, Vermont's Ecosystem Restoration Grant Program, and more
- Emergency Relief and Assistance Fund

FEMA	\$20 million (since 2012)
HUD's Community Development Block Grants	\$7 million
Vermont's Housing and Conservation Board	\$2+ million

FLOODPROOFING WATERBURY'S WASTEWATER TREATMENT PLANT VERMONT

Problem:

Situated in a low-lying mountain valley. Hurricane Irene in 2011 caused flooding at pump stations in the floodplain.

Solution:

Vermont Community Development Grant Program paid for stormproof doors at the pump station. Upgraded to dry pit submersible pumps. Added generators and moved electrical equipment higher in the building.

The upgraded pump station was tested in a July 2023 storm and worked well.



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Flood Disaster Lessons and Mitigation Successes at a Small Wastewater System in Vermont

Written by: Environmental Finance Center at the University of Maryland

Many communities' wastewater treatment plants and related infrastructure are located in or near floodplains, which makes sense given how these facilities work. However, this also means that they are prone to flooding. The Town of Waterbury, Vermont experienced catastrophic flooding during Hurricane Irene in 2011, as did the rest of the state. Their wastewater pump station was inundated and rendered inoperable for several days. To reduce the chances of this happening again, they implemented several flood mitigation measures at the facility over the next few years. Then, in 2023, major floods hit the Town again, putting their mitigation projects to the test. In this podcast, Bill Woodruff, the Town's Public Works Director, recounts their experiences and lessons learned from both events and shares the many ways that the Town has worked to improve all of their infrastructure's resiliency to flooding.



Source: Bill Woodruff EFCN Podcast Recorded July 27, 2023
<https://efcnetwork.org/flood-disaster-lessons-and-mitigation-successes-at-a-small-wastewater-system-in-vermont/>

CITY OF WICHITA FALLS PERMANENT REUSE PROJECT TEXAS

The increasingly drought prone City of Wichita Falls is constructing a permanent reuse project that will deliver indirect potable reuse water from the River Road Wastewater Treatment Plant to the City's raw water source, the Arrowhead Lake. When complete, this project will allow the plant to meet stringent effluent limits that will allow up to 16 Million Gallons Per Day (MGD) of processed wastewater to be added to the lake.

City of Wichita Falls General Funds	\$1 million/year for 8-10 years
Utility Fee Increases	
CW SRF Loan with \$252,000 of principal forgiveness	\$33 million

RECOMMENDED RESOURCES

- [Flood Funding Finder](#)
- [Nature-Based Solutions Resource Guide 2.0](#)
- [Federal Funding for Green Infrastructure and Nature-Based Solutions Summary Table](#)
- [Webcast - Navigating Federal Funding for Green Infrastructure and Nature Based Solutions](#)
- [EESI Fact Sheet - Federal Resources for Nature-Based Solutions to Climate Change](#)
- [Funding Sources By State Or Territory](#) (infrastructure)
- [Federal Funding for Water and Wastewater Utilities in National Disasters \(Fed FUNDS\)](#)
- [EPA's CREAT Tool](#)

CONCLUSION

- Consider funding options early in the planning process
- Diversify funding options by adopting integrated planning efforts
- Establish a portfolio of viable implementation projects
- Evaluate and prioritize funding options
- Reduce costs by aligning efforts to avoid duplicating projects, integrating projects into the annual budgeting process, sharing resources and technical services across jurisdictions, leveraging private partners, offering incentives, and adopting strategic policy goals
- Identify funding and financing options that are available in your community
- Develop a blended finance strategy by mixing various funding and finance strategies to implement projects

QUESTIONS?

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