FIELD GUIDE TO CSO+

A STRATEGY FOR ALIGNING PRIORITIES & TACTICS FOR UNLOCKING RESOURCES

RE:FOCUS PARTNERS + SCAPE

IN COLLABORATION WITH

NEW JERSEY FUTURE

Why You Should use the Field Guide to CSO+

Do you have trouble getting the resources or staffing required for projects to address Combined Sewer Overflows (CSOs) in your community? Do you have trouble "selling" CSO projects to other city officials, especially to your elected officials? It may be because CSO mitigation is competing with other important city priorities. The Field Guide to CSO+ can help you identify those other top city priorities and brainstorm if and how to pursue a project that addresses CSOs while simultaneously addressing other top city priorities, all with the goal of creating win-wins and opening up nontraditional funding/financing options.

Who Should Use The Field Guide to CSO+

City and utility officials who bear primary responsibility for addressing CSOs in their communities.

How You Should Use The Field Guide to CSO+

The Field Guide to CSO+ is an entry point for communities struggling to take action to address CSOs; specifically, it is intended to open up a strategic dialogue between elected officials and the city/utility officials who bear primary responsibility for CSO mitigation.

Approximate Time it Take to Use The Field Guide to CSO+

20 minutes, plus the time it takes to discuss and decide if pursuing a CSO+ project is right for your city.

re:FOCUS PARTNERS SCAPE NEW JERSEY FUTURE

FIELD GUIDE TO CSO+

A STRATEGY FOR ALIGNING PRIORITIES & TACTICS FOR UNLOCKING RESOURCES

The Field Guide to CSO+ was prepared by re:focus partners and SCAPE as a part of Build it Green (BIG), a collaborative program led by New Jersey Future and re:focus partners from 2016-2017. Support for Build it Green was generously provided by the Geraldine R. Dodge Foundation and New Jersey Health Initiatives of the Robert Wood Johnson Foundation.

A STRATEGY FOR ALIGNING PRIORITIES

FIELD GUIDE TO CSO+

Directions:

1. Answer these questions with your elected official(s). For each question, mark an X for every option that applies.
2. Tally the number of Xs in each column and record them under "Total Score." Your highest total scores indicate your community's top priorities that you may be able to address alongside CSOs to open up nontraditional funding/financing.
3. Use the accompanying CSO+ Tactics for Unlocking Resources to learn more about the CSO+ projects most relevant to your community. Discuss these options internally with your community, including with your elected officials, to decide if pursuing a CSO+ project makes sense for your city.

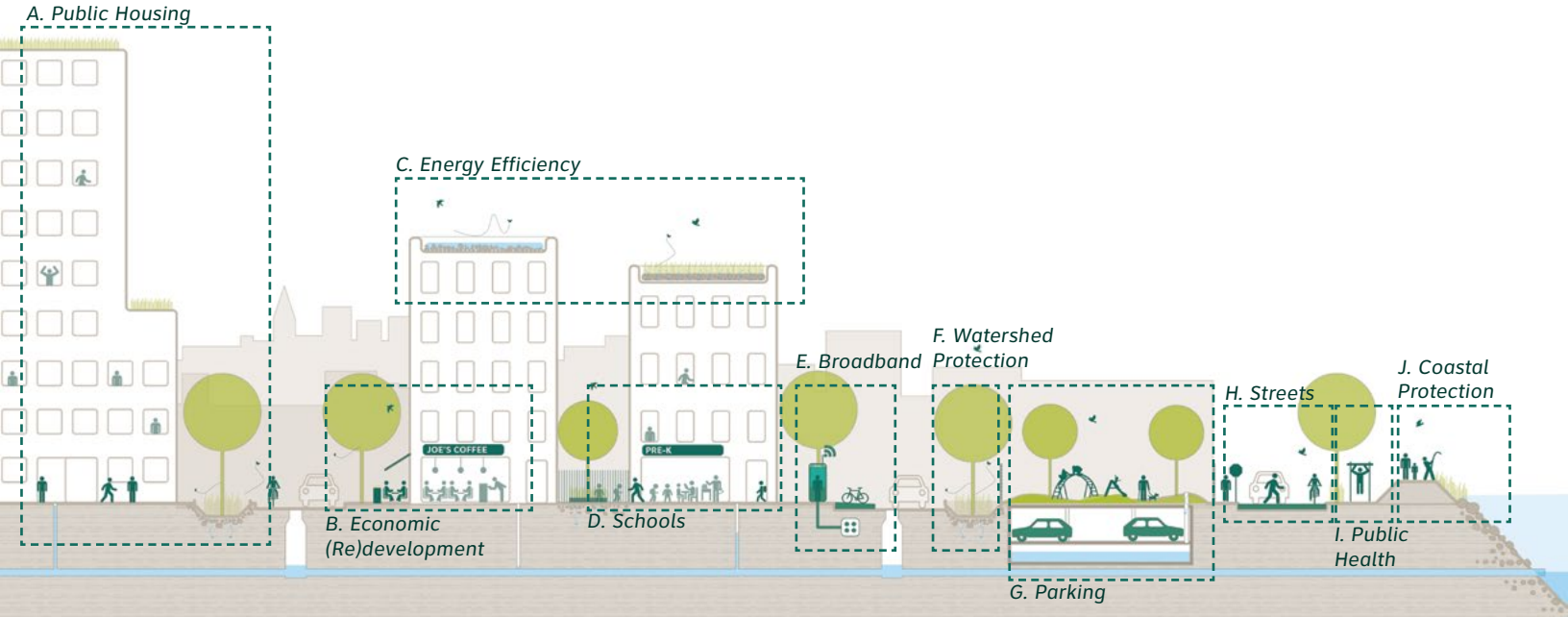
	A. Public Housing	B. Economic (Re)Development	C. Energy Efficiency	D. Schools	E. Broadband & Internet Access	F. Watershed Protection	G. Parking	H. Streets	I. Public Health	J. Coastal Protection
Which of these are your most underfunded priorities?										
If your Mayor were to give a speech tomorrow about one of these topics, which would it be?										
Which topics are identified as strategic priorities in your Master Plan or other strategic documents?										
Which items will likely be impacted in the future by rising costs?										
Which concerns are most important to citizens? Think about: small businesses, elderly, children, low-income.										
TOTAL SCORE										

General Notes

City Champion:
To pursue any CSO+ project, a city champion plays an essential role in advocating for the project with other city officials, project partners, and community members. Without a champion, projects often fail to get off the ground. The first step to pursue any CSO+ project, is to designate a city champion that will be actively involved in stakeholder engagement, and will become the face of the project. To that end, the Field Guide to CSO+ includes champion recommendations for each CSO+ project.

Green v. Grey Approaches:
The Field Guide to CSO+ does not discriminate between "green" and "grey" approaches to mitigating CSOs as different approaches are appropriate for different challenges. Often, the right CSO solution will involve a combination of both methods. Cities are, however, encouraged to consider nature-based approaches to addressing CSOs whenever possible because of the wide range of ancillary benefits (e.g. environment, health, beautification) associated with green approaches.

Funding/Financing:
The nontraditional resources presented for each CSO+ project are unlikely to pay for the full costs (e.g. planning, design, engineering, permitting, construction, O&M) associated with a project. In addition to the nontraditional resources presented in the field guide to CSO+, cities should plan on pursuing complementary funding through traditional means, such as state infrastructure trusts (e.g. New Jersey Environmental Infrastructure Trust), municipal bonds and grants.



TACTICS FOR UNLOCKING RESOURCES

A. CSO+ PUBLIC HOUSING

Many communities that struggle with combined sewer overflows (CSOs) also struggle to provide safe and attractive public housing for their most vulnerable residents. Green infrastructure in public housing presents a valuable opportunity to provide new amenities like playgrounds and gardens in areas that traditionally have minimal access to green spaces for recreation and leisure, while simultaneously managing storm water.

Who Should Consider this CSO+:

CSO communities with public housing.

What's Involved:

Designing and building green infrastructure that addresses needs of poor and vulnerable residents; working with residents to ensure that project(s) are maintained and offer a point of community safety and pride.

How to Pursue:

Work with residents to determine what outdoor amenities are most desirable; design, build and operate green infrastructure project(s) based on community feedback.

Inspirations:

- Bronx River Houses (New York, NY)
- Mariposa-Lincoln Park Public Housing Redevelopment (Denver, CO)

Implementation

City Champion

The CSO+ Public Housing champion must ensure awareness and support for the project in other city departments. S/he must be actively involved in working with community partners and ensure that the City makes provisions for the project(s) to be properly maintained. The CSO+ Public Housing champion in your community may be a program manager in the economic development office or an NGO partner.

Project Team

Depending on scale, projects may require a relatively small project team. At minimum, it will include the project champion, federal grant administrator, landscape architect, and appropriate construction professionals.

Partnerships

Strongly consider partnering with a trusted local NGO or charitable organization. A local NGO or charitable organization can help identify appropriate sites for green infrastructure, as well as to build community trust, and awareness of and engagement in project design, construction and O&M.

Capacity Required:

◆ ◇ ◇ ◇ (Low)

CSO+ FUNDING

Resource Spotlight: Housing and Urban Development (HUD)

Projects that incorporate green infrastructure into public housing can be eligible for funding through several programs of the federal agency of Housing and Urban Development (HUD), including the Community Development Block Grant (CDBG) Program, Section 108 Loan Guarantee Program and Sustainable Communities Regional Planning Grants. Grants may also be available through various EPA programs.

Resource Type:	**Federal Grants and Loans**
Scale of Resources Available:	**Medium**
Level of Effort to Secure Resources:	**Medium**
Resources Available for Planning/Design?	**Yes**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**Yes**

Eligibility & Requirements

Generally, projects must benefit a community's poorest or otherwise most vulnerable residents. For example, all activities completed under CDBG must meet one of the following national objectives for the program:

- Benefit low- and moderate-income persons,
- Prevent or eliminate slums or blight, or
- Address community development needs having a particular urgency because existing conditions pose a serious and immediate threat to health or welfare

All HUD programs require extensive community engagement. Specific eligibility and requirements vary by program.

Size of Funding

Varies by program and year.

Prerequisite Data

Varies by program but generally require economic (e.g. income, unemployment) data to determine eligibility.

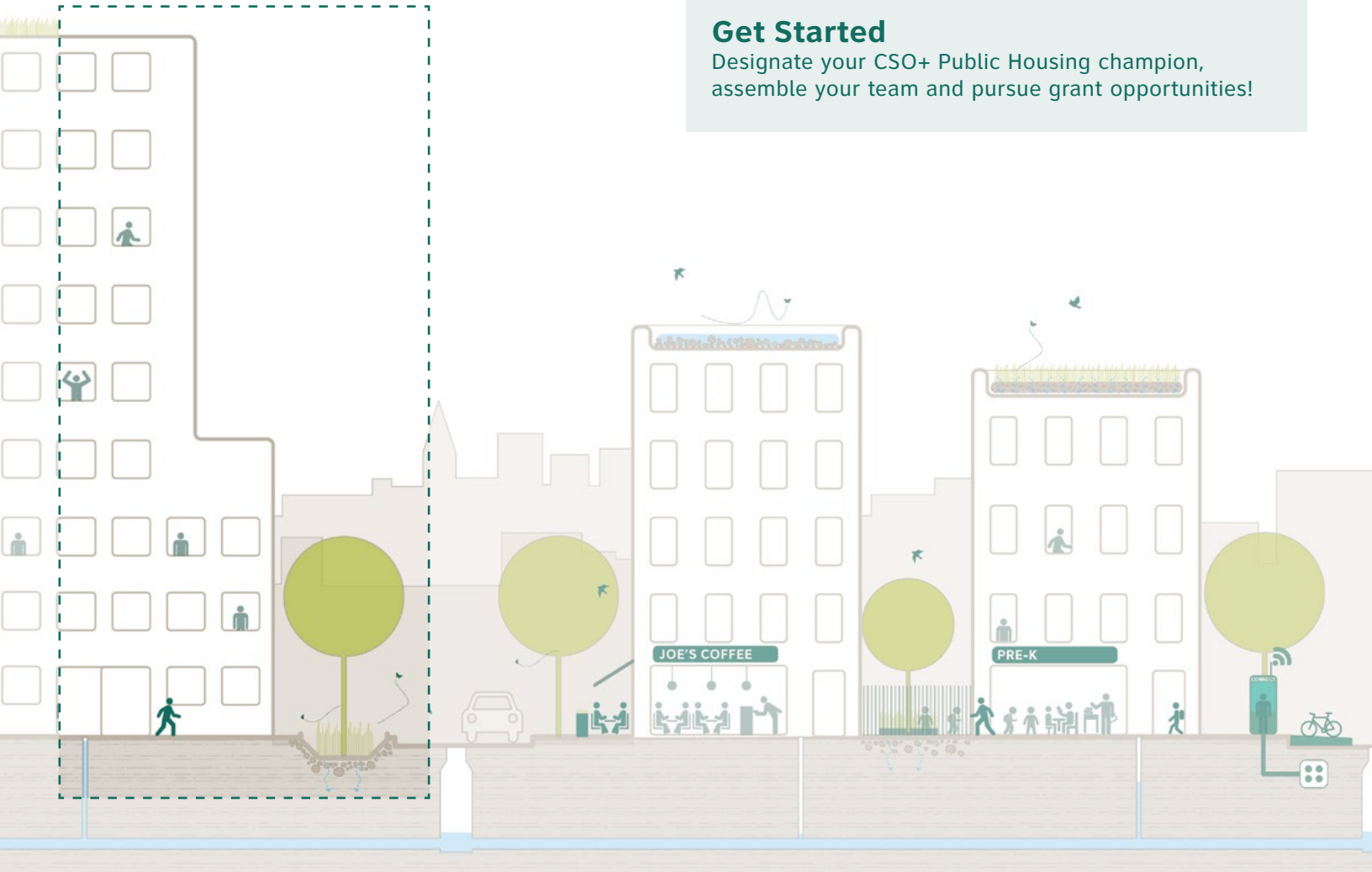
Funding Process

Varies by program and year.

Get Started

Designate your CSO+ Public Housing champion, assemble your team and pursue grant opportunities!

A. Public Housing



TACTICS FOR UNLOCKING RESOURCES

B. CSO+ ECONOMIC (RE)DEVELOPMENT

Many communities that struggle with combined sewer overflows (CSOs) also experience chronic, severe flooding that inhibits economic growth and development. Buildings and yards flood; electronic equipment has to be elevated; supply chains are interrupted; and employees have difficulty getting to and from work. For these CSO communities, retaining businesses is difficult because of both the business disruptions associated with flooding and the limits that current flooding place on growth.

Who Should Consider this CSO+:

"Distressed" CSO communities experiencing chronic flooding that inhibits economic growth and development.

What's Involved:

Explicitly designing CSO mitigation project(s) to remove barriers to growth and development and to encourage new investment.

How to Pursue:

Identify an area where chronic flooding limits growth for specific businesses. Commit to working with businesses to design and develop a project that mitigates flooding and spurs economic opportunity and innovation.

Inspirations:

- Glashaus Green Infrastructure (Emeryville, CA)
- The Grand River Urban Waters Federal Partnership (Grand Rapids, MI)
- Historic 4th Ward Park (Atlanta, GA)

Capacity Required:

◆ ◆ ◇ ◇ (MEDIUM)

Implementation

City Champion

The CSO+ Economic Development must ensure other city officials awareness of, support for and participation in project design and funding/financing, including officials from offices of the mayor, business administrator, community development, public works and engineering. S/he must:

- Work across departments and stakeholder groups to ensure that the project is built.
- Have appropriate authority to make strategic design and finance decisions.
- Possess enough seniority to directly communicate with elected officials, including the Mayor and City Council.

S/he will be actively involved in high-level management of the project team to ensure that the project is constructed on time and within budget, and that the project is properly maintained. The CSO+ Economic Development champion in your community may be the Director of Economic Development (or Redevelopment Agency), City Administrator, or Deputy Mayor.

Project Team

From priority setting and brainstorming to operation and maintenance, essential technical staff throughout the life of the CSO+ Economic Development project will include city officials (or contracted consultants) from the following departments: Planning, Economic/ Community Development, Public Works, Engineering, Grant Writing, and Federal Grants, Compliance & Administration. Significant design, engineering and public outreach activities are required prior to constructing a CSO+ Economic Development project. Plan to go through public procurement processes to secure these services.

Partnerships

Strategic partnerships with local business owners (e.g. chambers of commerce or business associations) and with the local water utility are essential. Consider pursuing partnerships with local academic institutions (e.g. Rutgers Small Business Development Center).

CSO+ FUNDING

Resource Spotlight: Economic Development Agency (EDA)

The Economic Development Agency (EDA) of the federal Department of Commerce provides predevelopment grants through its planning and technical assistance programs and construction support through its public works program.

Resource Type:	**Federal Grants**
Scale of Resources Available:	**Moderate**
Level of Effort to Secure Resources:	**Medium**
Resources Available for Planning/Design?	**Yes**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**No**

Eligibility & Requirements

- EDA invests in communities that are "economically distressed" on an income or unemployment basis.
- Proposed EDA investments must be consistent with local Comprehensive Economic Development Strategies (CEDs), as well as with EDA's national investment priorities.
- Most EDA awards require a 50% local match (cash or in-kind).

Size of Funding

$300K available for predevelopment through planning and technical assistance programs; $3M available for construction through public works program.

Prerequisite Data

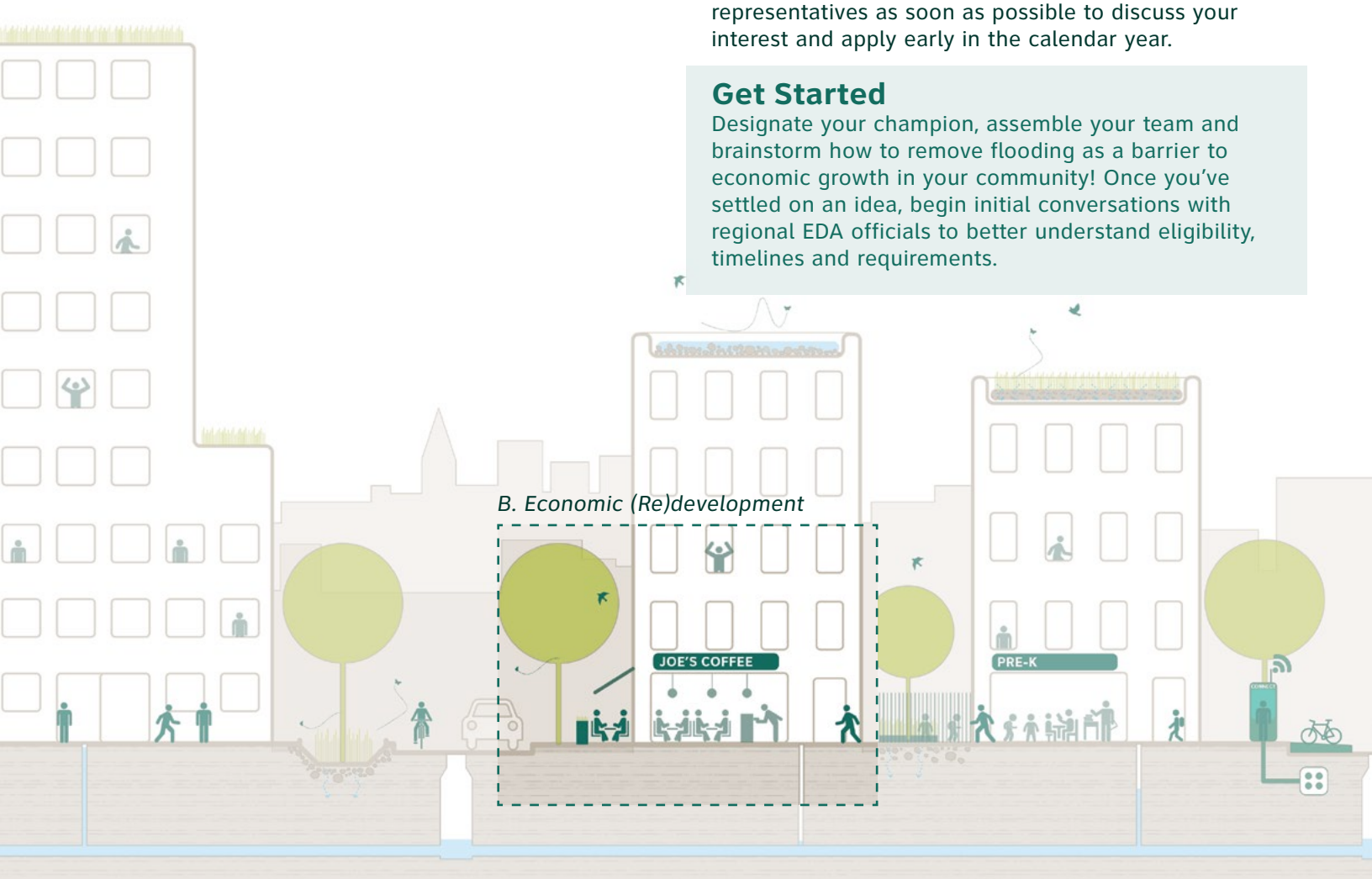
Applicants must tell a compelling story about how the proposed EDA investment will retain and/or create jobs before 2025 and provide detailed job retention and/or creation estimates from local employers.

Funding Process

EDA grants are awarded on a rolling basis. There are no set application deadlines. For the best chance of receiving a grant, engage with regional EDA representatives as soon as possible to discuss your interest and apply early in the calendar year.

Get Started

Designate your champion, assemble your team and brainstorm how to remove flooding as a barrier to economic growth in your community! Once you've settled on an idea, begin initial conversations with regional EDA officials to better understand eligibility, timelines and requirements.



B. Economic (Re)development

TACTICS FOR UNLOCKING RESOURCES

C. CSO+ ENERGY EFFICIENCY

Some strategies for addressing CSOs can also be used to improve building energy efficiency. For example, blue and green roofs simultaneously manage stormwater while decreasing buildings' heating, cooling, and electricity use. Pursuing a CSO+ Energy Efficiency project like blue roofs can help communities achieve both stormwater management and energy efficiency goals.

Who Should Consider this CSO+:

CSO communities that include high numbers of residential and/or commercial buildings with large electricity bills; CSO communities with explicit energy conservation goals.

What's Involved:

Incorporating green/blue roofs into building design and operations.

How to Pursue:

Assess state and local laws regarding tax rebates for energy efficiency and Property Assessed Clean Energy (PACE) Financing; pursue relevant policy changes (e.g. adoption of local ordinance) if required.

Inspirations:

- Bronx Blue-Green Roof (New York, NY)

Implementation

City Champion

To successfully pursue PACE financing for CSO+ Energy Efficiency projects, city and state champions are essential. The local champion will play a critical role in advocating for PACE with other State and City officials, NGOs, and community members. The champion must ensure awareness of and support for the program and its potential benefits. S/he would be actively involved in drafting local PACE legislation, program design and implementation. The CSO+ Energy Efficiency champion should be familiar with state and local legislative processes; for example, s/he may be a program manager in the Mayor's office or facilities department.

Project Team

Project teams will vary significantly depending on the project types (e.g. commercial, residential) covered by local PACE bonds.

Partnerships

Consider partnering with one of the several national and state NGOs dedicated to helping municipalities establish PACE programs. These NGOs provide best practices for local PACE ordinances and program design and implementation.

Capacity Required:

◆ ◆ ◇ ◇ (MEDIUM)

CSO+ FUNDING

Resource Spotlight: PACE

CSO+ Energy Efficiency projects may be eligible for PACE financing. PACE is a finance mechanism for building retrofits in which all upfront project costs are privately funded and repaid as a reassessment on the property's regular tax bill. CSO+ Energy Efficiency projects may also qualify for federal and state tax rebates (e.g. federal DOE Energy Efficiency Savings Program).

Resource Type:	**Private Finance**
Scale of Resources Available:	**Moderate**
Level of Effort to Secure Resources:	**Medium**
Resources Available for Planning/Design?	**Yes**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**Yes**

Eligibility & Requirements
A signature feature of PACE is that the loan is attached to the property itself, not to the property owner.

Size of Funding
PACE financing can cover 100% of project costs.

Prerequisite Data
Projects supported by PACE financing require prerequisite baseline energy use data and forecasts of reductions/savings.

Funding Process
State legislation that authorizes municipalities to establish PACE programs must exist. If state legislation exists, municipalities must establish local PACE programs before pursuing.

Get Started

Determine if your state has PACE legislation in place. If it does, engage with national and state NGOs to evaluate if PACE financing makes sense for your community.

C. Energy Efficiency

D. CSO+ SCHOOLS

Schools represent an excellent opportunity for addressing combined sewer overflows (CSOs), especially through green infrastructure, because they are often publicly owned and contain large impervious surfaces (e.g. rooftops, asphalt paving). Many green infrastructure interventions such as rain gardens, bioswales and pervious pavement, are aesthetically attractive and can provide opportunities to teach students about the water cycle. They can also be designed to integrate new recreational amenities like playgrounds.

Who Should Consider this CSO+:

CSO communities seeking to build small-scale green infrastructure projects.

What's Involved:

Working with school partners and/or NGOs to develop and implement education curriculum related to green infrastructure.

How to Pursue:

Identify appropriate site(s) for green infrastructure interventions; commit to working with school partners to design and construct project(s).

Inspirations:

- Green Schools Program (Philadelphia, PA)

Implementation

City Champion

The CSO+ Schools champion will play an essential role in advocating for the project with other city officials, school partners, and community members. S/he must ensure other city departments' awareness of and support for the project and must be actively involved in working with school, academic and NGO partners. Furthermore, s/he must ensure that the City makes provisions for the project(s) to be properly maintained. The CSO+ Schools champion may be a program manager in the water department, local utility, or partner NGO.

Project Team

Depending on scale, CSO+ Schools projects may require a relatively small project team. At minimum, it will include the project champion, landscape architect, and appropriate construction professionals.

Partnerships

Consider partnering with a local academic institution like Rutgers Cooperative Extension Water Resources Program to identify appropriate school sites for green infrastructure. They should also consider partnering with local/regional education-focused NGOs to develop educational curriculum and materials.

Capacity Required:

◆ ◇ ◇ ◇ (LOW)

CSO+ FUNDING

Resource Spotlight: Education Grants

There is a variety of national, regional and local education grants that can be used to fund CSO+ Schools projects, such as the US Green Building Council's Center for Green Schools Resources. The US Department of Education maintains a list of state resources available through state-based green schools programs.

Resource Type:	**Grants**
Scale of Resources Available:	**Small**
Level of Effort to Secure Resources:	**Low**
Resources Available for Planning/Design?	**Yes**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**Depends on grant**

Eligibility & Requirements
The primary applicant for an environmental education grant must be an educational institution or non-profit organization focused on education.

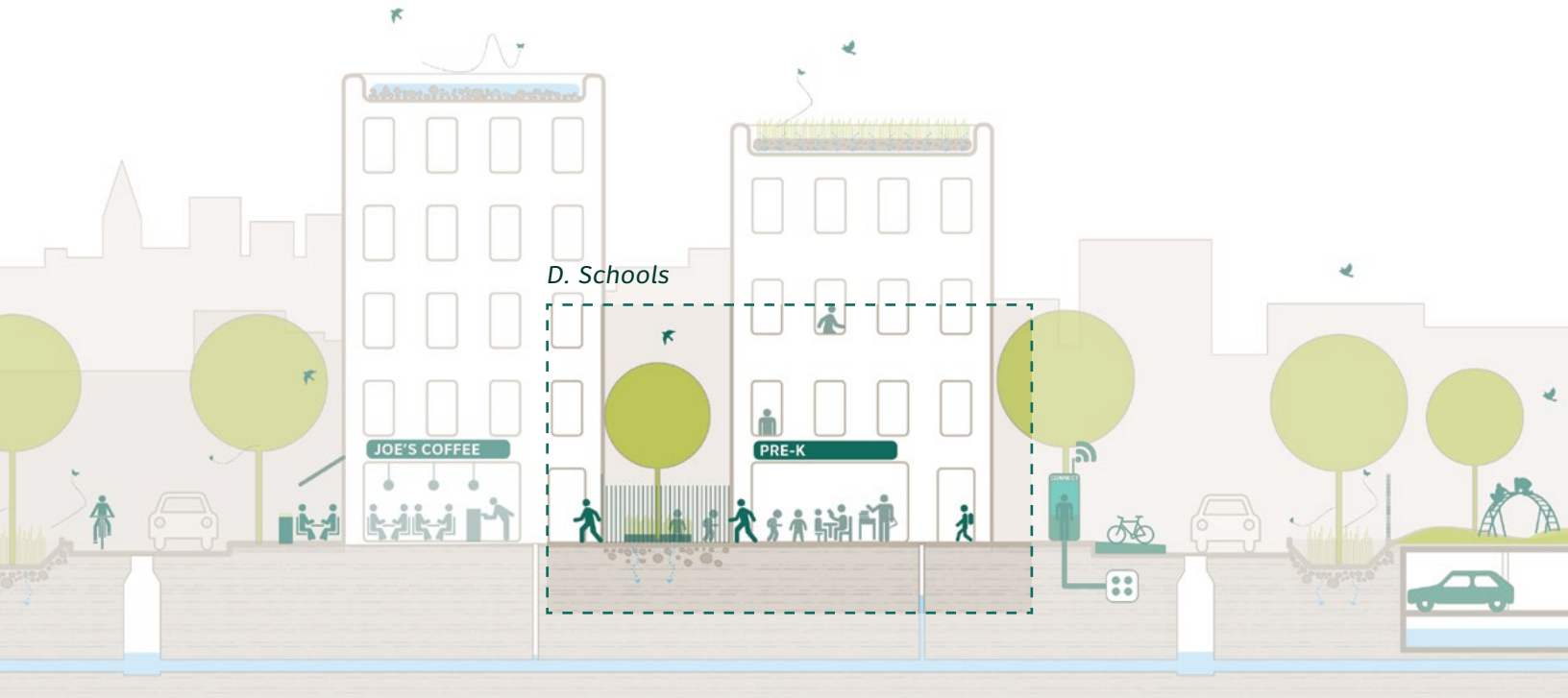
Size of Funding
Depends on the grant opportunity, but funding tends to be small scale ($40-80K)

Prerequisite Data
Depends on grant opportunity, but generally there are no prerequisite data requirements.

Funding Process
Application timelines and process depend on grant opportunity.

Get Started

Designate your CSO+ Schools champion, assemble your team and pursue grant opportunities!



TACTICS FOR UNLOCKING RESOURCES

E. CSO+ BROADBAND & INTERNET ACCESS

Some of the most proactive strategies for addressing combined sewer overflows (CSOs), like sewer separation, require below-ground utility improvements that involve major road construction. Other projects, like IT systems upgrades (e.g. wireless, broadband, fiber-optic, camera), also require similar interventions under roadways. Consistent with "dig once" policies, communities can proactively lay conduit while repaving roads or upgrading sewers. This allows cities and companies to coordinate on accessing and expanding high-priority space below city streets at lower cost and with fewer disruptions from uncoordinated construction projects.

Who Should Consider this CSO+:

CSO communities that include underserved populations without reliable access to Internet and telecommunications services (e.g. wireless, broadband).

What's Involved:

Engaging with IT and telecommunications companies to identify strategic areas for sewer and IT systems upgrades; coordinating construction schedules.

How to Pursue:

Identify goals and potential site(s) for new broadband expansion; reach out to BroadbandUSA (federal program) for technical assistance; explore options for working with private service providers to design and develop projects.

Inspirations:

- Broadband Internet Public-Private-Partnership (Rockport, ME)
- Big Broadband (Urbana-Champaign, IL)

Capacity Required:

◆ ◆ ◇ ◇ (MEDIUM)

Implementation

City Champion

The CSO+ Broadband & Internet Access champion will play an essential role in advocating for the project with other city officials, corporate partners, and community members. S/he must ensure other City departments' awareness of and support for the project and must be actively involved in working with the public works department, local water utility, BroadbandUSA, and corporate service providers. Furthermore, s/he must ensure that the City makes provisions for the project(s) to be properly maintained. The CSO+ Broadband & Internet Access champion may be a program manager in the water or IT departments or partner NGO.

Project Team

At the outset, CSO+ Broadband & Internet Access projects may require a relatively small project team to seek technical assistance and identify appropriate funding/financing or public-private partnership opportunities. At a minimum, the team should include the project champion, technical experts from the water, IT, and planning departments, and appropriate legal counsel to guide permitting and partnership discussions with private broadband providers.

Partnerships

Consider partnering with a local NGOs and academic institutions to identify high-priority sites for improving internet services in underserved communities. Also consider partnering with local/regional education-focused NGOs to improve outreach and digital inclusion activities.

CSO+ FUNDING

Resource Spotlight: National Telecommunications & Information Administration

Anticipated fiber lease fees can be used to finance all or part of a CSO+ Broadband & Internet Access project. This type of financing is similar to other revenue-based financing models, like using anticipated user fees to construct a toll road. The National Telecommunications & Information Administration of the federal Department of Commerce offers multiple types of grants including the Broadband Technology Opportunities Program (BTOP) and the State Broadband Initiative (SBI) funds to support state and local broadband planning and implementation activities.

Resource Type:	**Grant + Revenue Bond**
Scale of Resources Available:	**Large**
Level of Effort to Secure Resources:	**Medium**
Resources Available for Planning/Design?	**Yes**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**Yes**

Eligibility & Requirements

There are no formal eligibility requirements or restrictions on receiving technical assistance from the BroadbandUSA program. Interested communities and organizations should reach out directly by email (BroadbandUSA@ntia.doc.gov) to discuss funding options and how best to "assess local broadband needs, identify funding and other resources, engage critical partners, and plan network infrastructure projects and digital inclusion programs."

Size of Funding

Available funding depends on federal budget appropriations.

Prerequisite Data

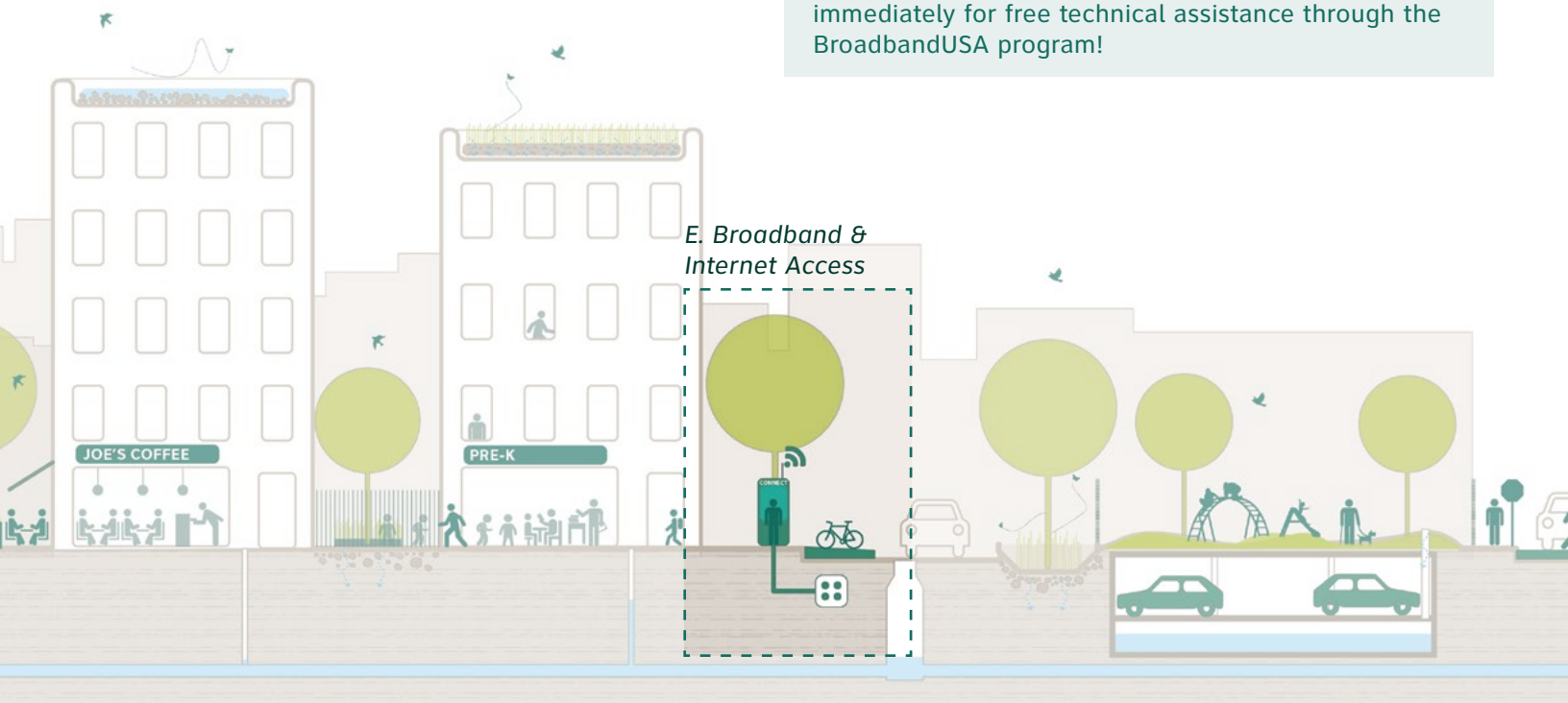
There are no prerequisite data requirements for communities seeking technical assistance through the BroadbandUSA program; however, recipients of assistance should anticipate collecting data on potential sites for broadband installation, local population and demographic characteristics (potential users), and existing network and service provider information.

Funding Process

Technical assistance to access federal grants and other resources is available through the BroadbandUSA program free of charge and on a continuous basis. Grant application timelines and process vary by opportunity.

Get Started:

Designate your CSO+ Broadband & Internet Access champion, assemble your team and reach out immediately for free technical assistance through the BroadbandUSA program!



E. Broadband & Internet Access

TACTICS FOR UNLOCKING RESOURCES

F. CSO+ WATERSHED PROTECTION

Combined sewer overflows (CSOs) are a major source of large-scale pollution and environmental degradation. Capturing and cleaning stormwater and wastewater before it reaches rivers, bays, or other vulnerable ecosystems can offer multiple environmental performance benefits, including improved water quality, reduced flooding, and habitat protection and restoration.

Who Should Consider this CSO+:

CSO communities that want to undertake large-scale green infrastructure but are concerned that such infrastructure may not perform as well as traditional "grey" solutions and want to hedge against that risk.

What's Involved:

Designing large-scale green infrastructure project(s) explicitly with the goal of reducing storm water runoff; committing to tie project finance to environmental performance through a "pay-for-success" model; continually evaluating environmental performance of green infrastructure project(s).

How to Pursue:

Design large-scale green infrastructure project(s); commit to working with investors to structure project finance based on continual monitoring and evaluation.

Inspirations:

- DC Clean Rivers Project (Washington, D.C.)

Capacity Required:

◆ ◆ ◆ ◆ (HIGH)

Implementation

City Champion

The CSO+ Watershed Protection champion must coordinate a large number of infrastructure projects to achieve set environmental performance targets and avoid implementation. S/he must ensure city officials awareness of, support for and participation in project design and funding/financing, including officials from offices of the mayor, CFO/business administrator, public works and engineering. S/he must be actively involved in deal structuring with investors. This person must:

- Work across departments and stakeholder groups to ensure that the project is built.
- Have appropriate authority to make strategic design and finance decisions.
- Possess enough seniority to be able to directly communicate with elected officials, including the Mayor and City Council.

S/he will be actively involved in high-level management of the project team to ensure that the project is constructed on time and within budget, is properly maintained, and performance data is appropriately collected and analyzed. The CSO+ Watershed Protection champion must have knowledge of municipal finance; for example, s/he may be the Director of Public Works or a senior utility official.

Project Team

From project design and deal structuring to construction, operation and maintenance, essential technical staff throughout the life of the CSO+ Watershed Protection project must include city officials (or contracted consultants) from public works and engineering departments. Significant modeling, design, engineering, public outreach and monitoring activities are required prior to constructing a CSO+ Watershed Protection project. Plan to use public procurement processes to secure these services.

Partnerships

Plan to work closely with investors to structure the EIB, including environmental performance targets, associated payments, and performance evaluation methodology; plan to work closely with the local utility provider.

CSO+ FUNDING

Resource Spotlight: Environmental Impact Bond (EIB)

Environmental Impact Bonds (EIBs) are a "pay-for-success" financing model available for projects that measurably reduce stormwater runoff or other environmental performance metrics. A city or utility pays the upfront predevelopment and construction costs but shares the performance risks of managing CSOs with investors. The city/utility payments on the EIB vary based on the project's measured environmental performance.

Resource Type:	**Pay-for-Success**
Scale of Resources Available:	**Large**
Level of Effort to Secure Resources:	**High**
Resources Available for Planning/Design?	**No**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**Yes**

Eligibility & Requirements

- Requires a large-scale green infrastructure project(s) whose environmental performance is measurable using a predetermined methodology.
- Cities/utilities must be committed to rigorous long-term evaluation and monitoring.
- As EIB's are a variation of traditional municipal bonds, cities/utilities should have strong credit ratings and available debt capacity.

Size of Funding

The size of funding available depends on the scope and scale of project; the DC Water EIB for the Clean Rivers Project was $25 million.

Prerequisite Data

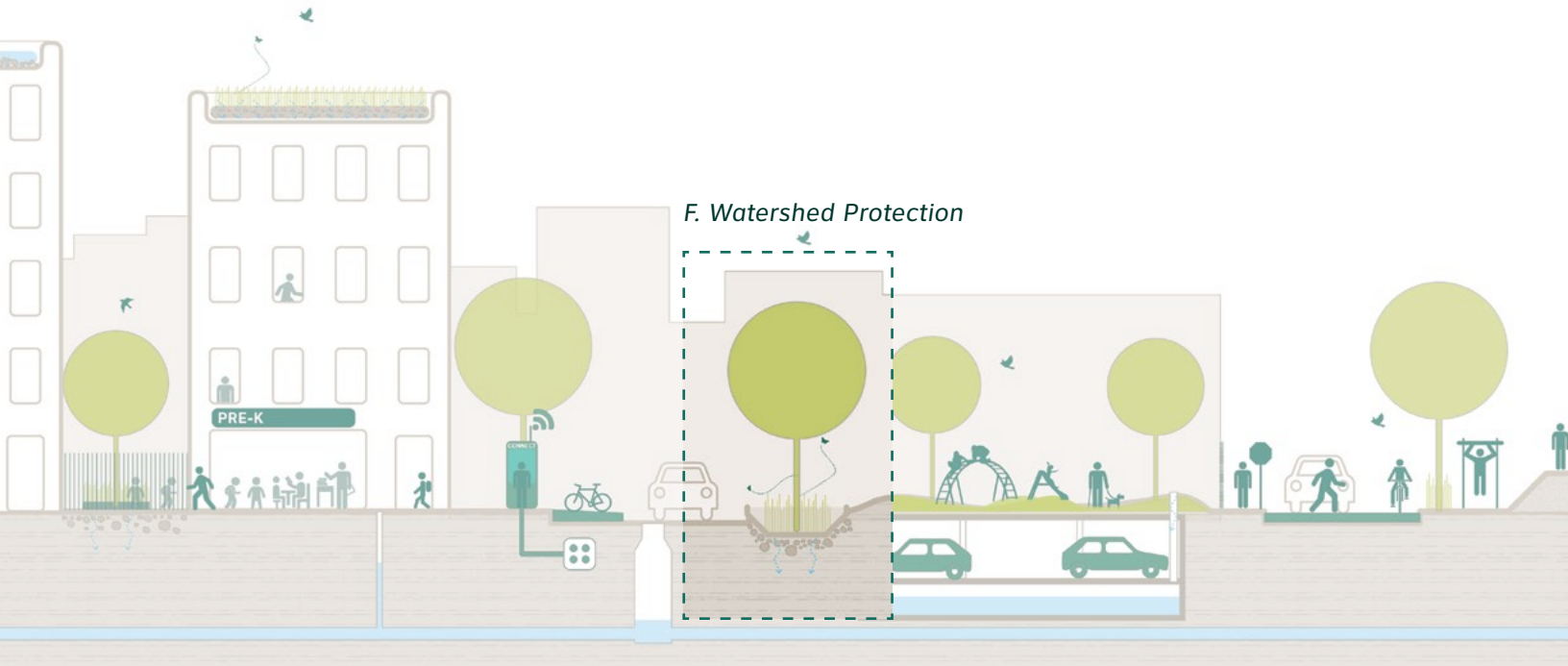
Environmental performance data (baseline and projections) are essential and prerequisite to structuring an EIB.

Funding Process

There is no standard process for pursuing an EIB; the process varies project by project.

Get Started

Designate your champion, assemble your team and brainstorm what ecosystem benefits could be created through large scale green infrastructure investments. Once you've settled on a set of ideas, begin initial conversations with relevant departments to gather baseline data and evaluate potential funding options.



F. Watershed Protection

TACTICS FOR UNLOCKING RESOURCES

G. CSO+ PARKING

Reducing the amount of impervious land associated with parking is frequently a top priority for cities seeking to mitigate CSOs because surface parking often represents a large percentage of impervious (i.e. paved) land in cities. At the same time, however, cities often experience pressure from residents and businesses to increase the amount of available parking. Underground garages offer a unique opportunity to create below-ground stormwater detention systems and retain street level open/green space for much-needed community amenities.

Who Should Consider this CSO+:

High-density CSO communities with significant parking and open-space challenges.

What's Involved:

Developing a parking garage with underground stormwater detention system; using parking fees to finance project.

How to Pursue:

Identify appropriate site for combined underground parking garage + stormwater detention; work with local utility to begin design process that optimizes parking capacity and the volume of water detained during storms.

Inspirations:

- US Bank Stadium West Plaza Stormwater Solution (Minneapolis-St. Paul, MN)
- Santa Monica Library (Santa Monica, CA)

Capacity Required:

◆ ◆ ◆ ◇ (HIGH)

Implementation

City Champion

The CSO+ Parking champion must have a technical/engineering background and finance experience. The CSO+ Parking champion will play an essential role in optimizing the size, cost, stormwater capacity, and revenue potential of the project. The champion must ensure relevant city departments' awareness of, support for and participation in project design and funding/financing, particularly officials from the departments/offices of the Mayor, Business Administrator, Public Works, Police and Fire. S/he must:

- Work across departments, with several stakeholders, to ensure that the project is well designed and built.
- Have appropriate authority to make strategic design and finance decisions.
- Possess enough seniority to directly communicate with elected officials, including the Mayor and City Council.

The CSO+ Parking champion in your community may be the Director of Public Works or a senior utility official, such as a chief engineer.

Project Team

From design and engineering analysis to operation and maintenance, essential technical staff throughout the life of the CSO+ Parking project will include city officials (or contracted consultants) from the following departments: planning, transportation, engineering, public works. The offices of the CFO, capital planning, and/or bond counsel will be essential in determining the appropriate project size, cost and revenue structure. Significant design, engineering and public outreach are required prior to construction. Plan to use public procurement processes to secure these services.

Partnerships

- Plan to work closely with local utility from the start of the design process to ensure appropriate stormwater system connections and benefits.
- Seek legal guidance to develop RFP for engineering services and any third party financing that limits "value engineering" or other cost reductions that compromise intended environmental benefits.

CSO+ FUNDING

Resource Spotlight: Revenue Bond

Anticipated parking fees can be used to finance the entire CSO+ Parking project, including the underground stormwater detention system and above-ground open space. This type of financing is similar to other revenue or user fee based financing models, like using anticipated toll revenues to construct a toll road. This approach is also compatible with public-private partnerships or concession agreements.

Eligibility & Requirements

Resource Type:	**Revenue Bond**
Scale of Resources Available:	**Medium**
Level of Effort to Secure Resources:	**Medium**
Resources Available for Planning/Design?	**No**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**No**

- Requires available surface and underground space with soil structure to support new construction and adequate connections to the stormwater system.
- Cities/utilities must be committed to working with the local water utility to ensure that all new connections (e.g. pressure, pumping capacity) to and from the stormwater detention chamber are integrated into the overall system.

Size of Funding

The amount of funding available depends on project specifications, including the number of parking spaces, anticipated parking rates, and the operating life of the project.

Prerequisite Data

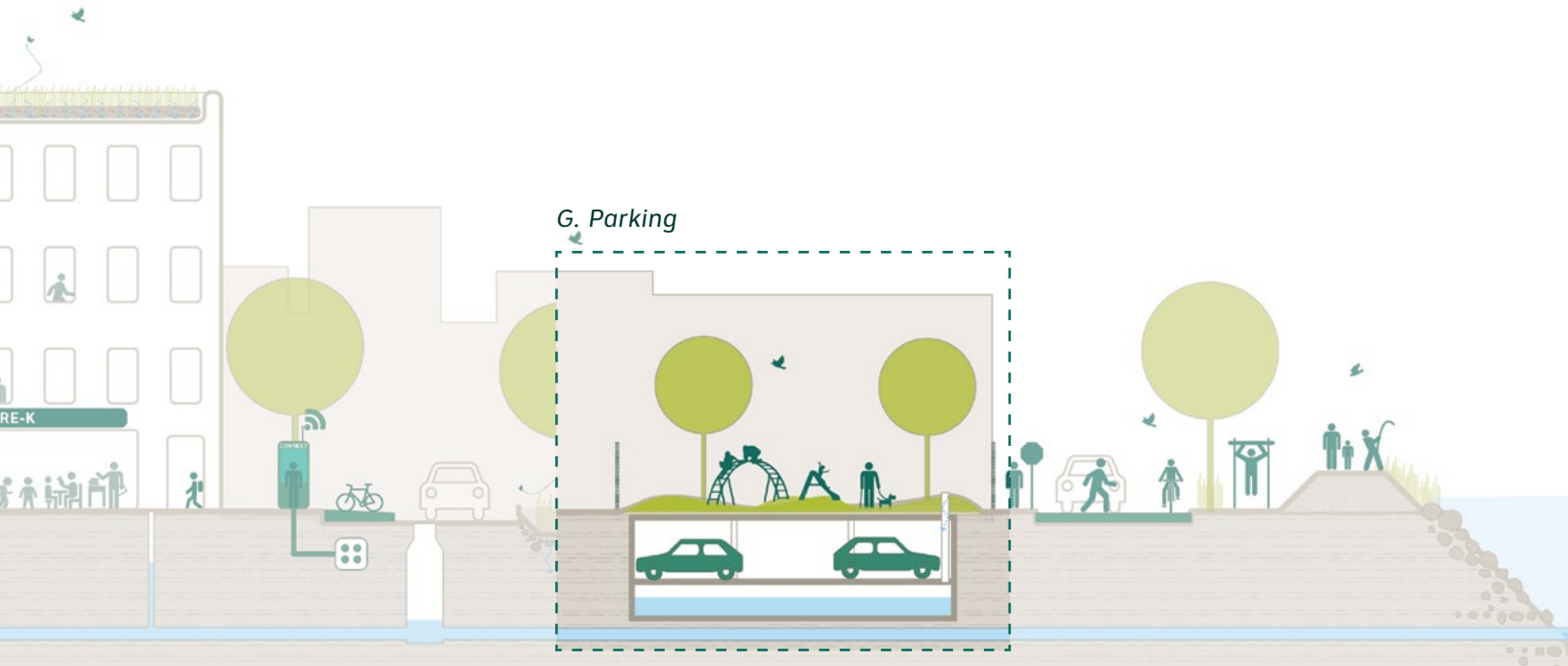
Subsurface soil characteristics and hydrological data to evaluate the engineering design limits of specific sites are essential prerequisites to calculating potential revenues and structuring a bond.

Funding Process

Most cities have standard processes for revenue bond issuances. Project design decisions should be based on available bonding capacity.

Get Started

Designate your champion and convene public works staff and utility officials to strategically identify sites that could improve parking capacity and stormwater management. Once a site is identified, seek predevelopment funds for design and engineering.



G. Parking

TACTICS FOR UNLOCKING RESOURCES

H. CSO+ STREETS

Effective strategies for addressing combined sewer overflows can include redesigning street(s) to include green infrastructure interventions like bioswales, which divert stormwater from the combined sewer system by increasing infiltration and reducing runoff. Green infrastructure can be effectively combined with targeted upgrades to surface transportation infrastructure to create safe and attractive multimodal transportation corridors that simultaneously manage stormwater.

Who Should Consider this CSO+:

CSO communities that are interested in upgrading streets (e.g. adding raised crosswalks, sidewalk bumpouts, and dedicated bicycle lanes).

What's Involved:

Redesigning street(s) into safe and attractive multimodal corridors to reduce CSOs and increase pedestrian and bicycle safety, mobility, and access.

How to Pursue:

Identify a corridor for improvement, which should be located in the CSO watershed and should be strategically important for mobility and access (e.g. connects a mass transportation stop with other community amenities). Commit to developing a project that transforms the identified street(s) into a safe and attractive multimodal corridor that simultaneously mitigates CSOs.

Inspirations:

- Ocean Park Boulevard Green Street (Santa Monica, CA)

Capacity Required:

◆ ◆ ◇ ◇ (MEDIUM)

Implementation

City Champion

The CSO+ Streets champion must ensure other city departments' awareness of, support for and participation in project design and funding/financing, particularly officials from the departments/offices of the Mayor, business administrator, public works, police and fire. This person must:

- Work across departments, with several stakeholders, to ensure that the project is built.
- Have appropriate authority to make strategic design and finance decisions.
- Possess enough seniority to directly communicate with elected officials, including the Mayor and City Council.

The right CSO+ Streets champion in your community may be the Director of Planning, Transportation or Public Works.

Project Team

From priority setting and brainstorming to operation and maintenance, essential technical staff throughout the life of the CSO+ Streets project will include city officials (or contracted consultants) from the following departments: planning, transportation, engineering, public works, grant writing and administration. Significant design, engineering and public outreach are required prior to constructing a CSO+ Streets project. Plan to use public procurement processes to secure these services.

Partnerships

Partnerships depend on location of street improvements. Consider residents and businesses located near the chosen site to be natural partners and seek to engage them in planning and design processes.

CSO+ FUNDING

Resource Spotlight: Transportation Alternatives Program (TAP)

State Transportation Alternatives Programs (TAP), for example NJDOT TAP, provide construction funding on a reimbursement basis for community based non-traditional projects designed to strengthen the cultural, aesthetic and environmental aspects of the country's surface transportation system.

Resource Type:	**Grant (Reimbursement Basis)**
Scale of Resources Available:	**Small**
Level of Effort to Secure Resources:	**Low**
Resources Available for Planning/Design?	**Yes**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**No**

Eligibility & Requirements

Eligibility and requirements vary state-by-state. In New Jersey, TAP projects must fall into one of seven categories, including design and construction of on-road and off-road trail facilities for pedestrians and bicyclists. Some state TAPs have strict requirements. For example, for NJDOT TAP:

- Costs incurred prior to the execution of the project agreement (e.g. planning, design) are not eligible for reimbursement.
- Projects must be authorized for construction within 2 years of the grant notification.
- Projects must have formal community support.
- Prior to construction authorization, all permits (environmental, jurisdictional, highway occupancy, etc.) must be approved.

Size of Funding

Funding availability per project varies by state and by application cycle; NJDOT TAP offered up to $1 million in funding per project on a reimbursement basis in 2016.

Prerequisite Data

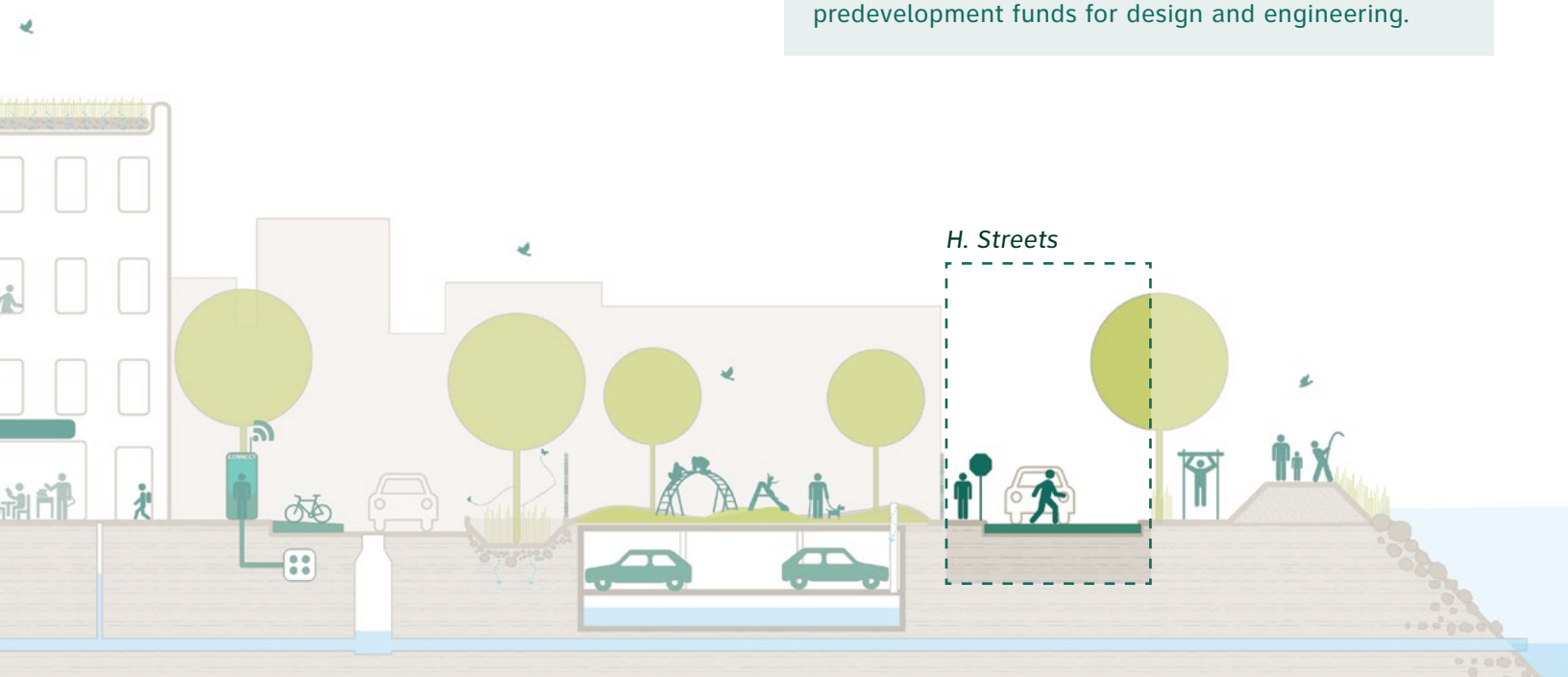
None.

Funding Process

Application cycles vary by state and by year. Communities should sign up for alerts through state electronic grant administration systems.

Get Started

Designate your champion, assemble your team and strategically identify a corridor for improvement. Once a corridor is identified, determine priorities in consultation with local stakeholders and seek predevelopment funds for design and engineering.



TACTICS FOR UNLOCKING RESOURCES

I. CSO+ PUBLIC HEALTH

Communities that have large poor and vulnerable populations that struggle with preventable health issues, like asthma and obesity, are also often the same areas with failing infrastructure systems. This includes CSO communities. Not only are CSOs themselves associated with serious human health impacts resulting from water pollution, but the conditions (e.g. highly paved urban areas) that contribute to poor stormwater runoff management also create urban heat islands and poor urban air quality that further negatively impact residents' health. Green infrastructure (e.g. bioswales, street trees) can improve health outcomes, like reducing acute asthma incidents, while simultaneously addressing CSOs.

Who Should Consider this CSO+:

CSO communities with poor environmental health indicators.

What's Involved:

Designing green infrastructure project(s) with the explicit purpose of improving health outcomes (e.g. reduced acute asthma incidents, reduced heat island effect); partnering with local health foundations and hospitals to monitor and evaluate project performance; committing to tie project finance to project performance through a "pay-for-success" model.

How to Pursue:

Identify areas that contain large populations with poor health indicators; identify site(s) within those areas to construct green infrastructure; work with local health foundations and hospitals to continually monitor and evaluate health metrics.

Inspirations:

- The Asthma Impact Model (Fresno, CA)

Implementation

City Champion

The CSO+ Public Health champion will play an essential role in advocating for the project with other city officials, hospital and NGO partners, and community members. S/he must ensure that the City makes provisions for the project(s) to be properly maintained and for environmental performance to be monitored and evaluated to a predetermined level. The CSO+ Public Health champion in your community may be a program manager in the public works department.

Project Team

Depending on scale, projects may require a relatively small project team. At minimum, it will include the project champion, landscape architect, and appropriate construction professionals.

Partnerships

Consider local health foundations and hospitals essential partners, especially in designing performance evaluation metrics and methodologies.

Capacity Required:

◆ ◆ ◇ ◇ (MEDIUM)

CSO+ FUNDING

Resource Spotlight: Social Impact Bond

Social Impact Bonds (SIBs) are a financing tool available for projects that measurably improve health (or other predetermined social) metrics. They are a "pay-for-success" financing tool in which investors pay for the upfront capital costs of a project and the city/utility makes bond payments when predetermined health (or other social) metrics are achieved.

Resource Type:	**Pay-for-Success**
Scale of Resources Available:	**Low**
Level of Effort to Secure Resources:	**High**
Resources Available for Planning/Design?	**No**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**No**

Eligibility & Requirements

The primary requirement to pursue an SIB is a green infrastructure project(s) whose health outcomes are measurable using a predetermined methodology. Cities/utilities must be committed to rigorous evaluation and monitoring in order to pursue this financing option. As SIB's are a variation of traditional municipal bonds, cities/utilities should have strong credit ratings and available debt capacity to consider this resource.

Size of Funding

The size of funding available varies depends on the scope and scale of project, but most CSO+ Public Health projects will involve a series of small-scale green infrastructure projects like bioswales and street trees.

Prerequisite Data

Health metrics (baseline and projections) are essential and prerequisite to structuring an SIB for a CSO+ Public Health project.

Funding Process

There is no standard process for pursuing an SIB; the process varies project by project.

Get Started

Assess your community's environmental health indicators to discuss and determine if using a SIB to fund a CSO+ Public Health project makes sense for your community.

TACTICS FOR UNLOCKING RESOURCES

J. CSO+ COASTAL PROTECTION

Many coastal communities that struggle with combined sewer overflows (CSO) also face significant storm surge risks due to hurricanes. For example, several New Jersey CSO communities were also those hardest hit by Hurricane Sandy. These communities often contain hundreds of millions of dollars in assets perilously exposed to surge damage, including public infrastructure, like transit systems, or private assets, like hospitals and redevelopment projects. These communities frequently have little or no insurance in place for exposed assets or are facing serious increases in insurance costs.

Who Should Consider this CSO+:

CSO communities with significant public or private assets exposed to storm surge risk.

What's Involved:

Designing a large-scale coastal protection project (e.g. berm, seawall, or other natural coastal protection) that generates measurable financial risk reductions and capturing financial value of these reductions to fund complementary CSO mitigation projects.

How to Pursue:

Identify large asset holders in your city that stand to lose the most money (through physical damage, business disruptions) during a hurricane. Commit to developing an infrastructure project that will reduce their total collective financial losses.

Inspirations:

- New York Metropolitan Transportation Authority (New York, NY)

Capacity Required:

◆ ◆ ◆ ◆ (HIGH)

Implementation

City Champion

The CSO+ Coastal Protection champion must have engineering and financial expertise. S/he must ensure other city departments' awareness of, support for and participation in project design and funding/financing, particularly the departments and/or offices of: the mayor, CFO, public works and engineering. S/he must:

- Work across departments, with several stakeholders, to ensure that the project is properly designed and built.
- Have appropriate authority to make strategic design and finance decisions.
- Possess enough seniority to directly communicate with elected officials, including the Mayor and City Council.

S/he will be actively involved in high-level management of design and engineering teams, as well as the financial modeling process. The CSO+ Coastal Protection champion in your community may be a Chief Resilience Officer (CRO) or Deputy Mayor.

Project Team

From priority setting and brainstorming to operation and maintenance, essential technical staff throughout the life of the CSO+ Coastal Protection project will include city officials from the following departments: CFO / financial advisor, public works, engineering, planning, economic/community development. Significant insurance planning, modeling, design, engineering and public outreach activities are required prior to constructing a CSO+ Coastal Protection project. Plan to engage financial advisors and use public procurement processes to secure these services.

Partnerships

Primary partners are large asset owners who stand to gain the most financially from the construction of the project. Engaging these asset holders and enlisting their support is essential.

CSO+ FUNDING

Resource Spotlight: Resilience Bond

Projects that generate measurable financial risk reductions to storm surge can use Resilience Bonds to leverage insurance savings for project finance. A Resilience Bond is an insurance policy and a variation on a catastrophe bond (not municipal bond) that captures the financial value of avoided losses that result from resilience projects in the form of a rebate.

Resource Type:	**Insurance Contract**
Scale of Resources Available:	**Large**
Level of Effort to Secure Resources:	**High**
Resources Available for Planning/Design?	**No**
Resources Available for Construction?	**Yes**
Resources Available for O&M?	**Yes**

Eligibility & Requirements

- Resilience Bonds require a defined project with clear design specifications.
- Proposed projects must be evaluated using financial industry catastrophe models to assess the potential for reducing and capturing financial losses / insurance benefits.
- Most Resilience Bonds require up-front resources to support initial modeling.

Size of Funding

The size of funding available depends on the scale of the measurable financial risk reductions associated with the coastal protection project, but may be large enough to finance the construction of future phases of work or fully support complementary infrastructure projects.

Prerequisite Data

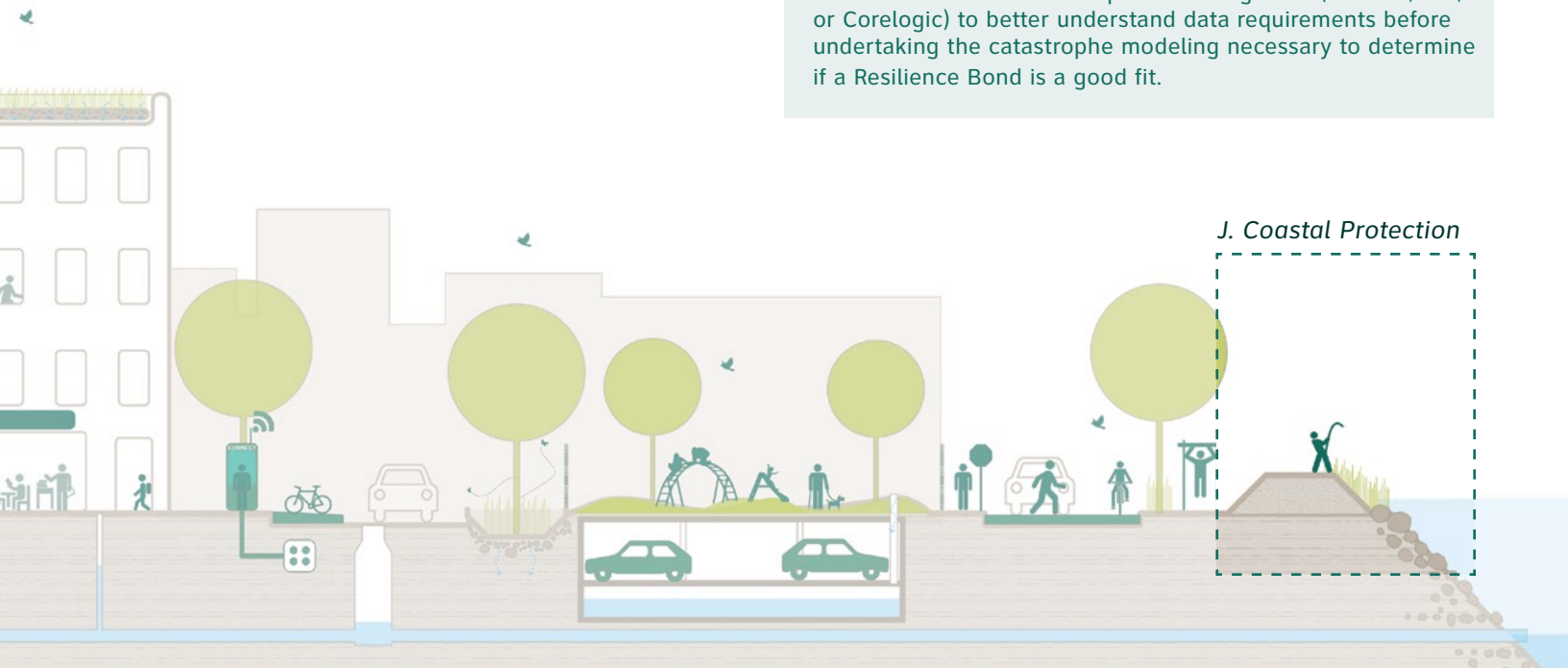
Projects must generate financial risk reductions that can be measured by catastrophe models, which forecast the financial value that will accrue as a result of a coastal protection project. To complete the necessary modeling, firms require simple project specifications; for example, for a seawall, firms require the height and end points of the seawall or the level of protection provided (e.g. protection against the 100-year storm).

Funding Process

There is no standard process for pursuing Resilience Bonds; the process varies project by project.

Get Started

For more information, read the RE.bound report.
If a Resilience Bond seems appropriate, designate your CSO+ Coastal Protection champion and assemble your team. Reach out to re:focus partners and/or initiate conversations with one or more of the catastrophe modeling firms (i.e. RMS, AIR, or Corelogic) to better understand data requirements before undertaking the catastrophe modeling necessary to determine if a Resilience Bond is a good fit.



TACTICS FOR UNLOCKING RESOURCES

CSO+ GLOSSARY

100-year Storm Surge:

A storm surge event of a particular magnitude that has a one percent chance of occurring in any given year.

Berm

A raised strip of land, constructed with natural materials such as soil and planted grass or artificial materials such as wooden beams or gravel, along a waterway that is implemented in order to prevent flooding.

Bioswale

A nature-based approach to managing stormwater from a large impervious surface like a parking lot or road that includes gently sloped sides and is vegetated with plants that can withstand both heavy watering and drought.

Blue Roof

A roof designed to slow or temporarily store rainwater using various types of detention systems.

Combined Sewer Overflow (CSO)

Overflows that occur when the volume of wastewater exceeds the capacity of a combined sewer system and/or sewage treatment plant. For example, during heavy rainfall or snowmelt events, untreated stormwater and wastewater discharges directly to nearby public waterways or up through storm drains onto streets and sidewalks . Combined sewer overflows (CSOs) can contain untreated or partially treated human and industrial waste, toxic materials, and debris, as well as stormwater.

Combined Sewer System

A combined sewer is a system of pipes that contains stormwater along with sanitary water and sewage. During significant wet weather conditions, these sewer systems can become overloaded and release untreated combined waste streams in events called combined sewer overflows (CSOs).

Environmental Health

Aspects of human health and disease that are determined by factors in the environment (e.g. exposure to pollutants).

Green Infrastructure

Landscape design that incorporates features that enhance and restore the natural flow of water throughout an ecosystem.

Green Roof

Vegetated area built on the roof of a building to maximize water retention, and can also incorporate other irrigation systems for diversion and reuse of collected excess water not used by plants.

Grey Infrastructure

Traditional water resource management technologies such as pipes, tanks, water treatment plants, etc.

Impervious Surface

Groundcover which prevents the infiltration of water into the ground, such as concrete or asphalt.

TACTICS FOR UNLOCKING RESOURCES

Pay-for-Success

An approach to government contracting that ties payment for service delivery to the achievement of measurable outcomes and aims to direct public resources toward high-performing social or environmental programs.

Pervious Pavement

Pavement that is designed to allow infiltration of stormwater through the surface into the soil below.

Private Finance

Method of funding major capital investments where private firms are contracted to build public projects. Under private finance arrangements, private companies, rather than government agencies, handle up-front costs and receive the revenues or payments associated with a project or investment.

Rain Garden

An area of shallow surface depression that is covered in vegetation to allow rainwater and bypassing runoff to be absorbed into the soil and used by plants or infiltrated into the groundwater supply rather than contributing to flooding or pollution in waterways.

Revenue Bond

Municipal bonds that finance income-producing projects and are secured by a specified revenue source. Typically, revenue bonds can be issued by any government agency or fund that is managed in the manner of a business, such as entities having both operating revenues and expenses (Source: Investopedia).

Seawalls

Hard infrastructure barriers designed to protect coastal and inland communities from flood waters, including tidal flooding and storm surges.

Sewershed

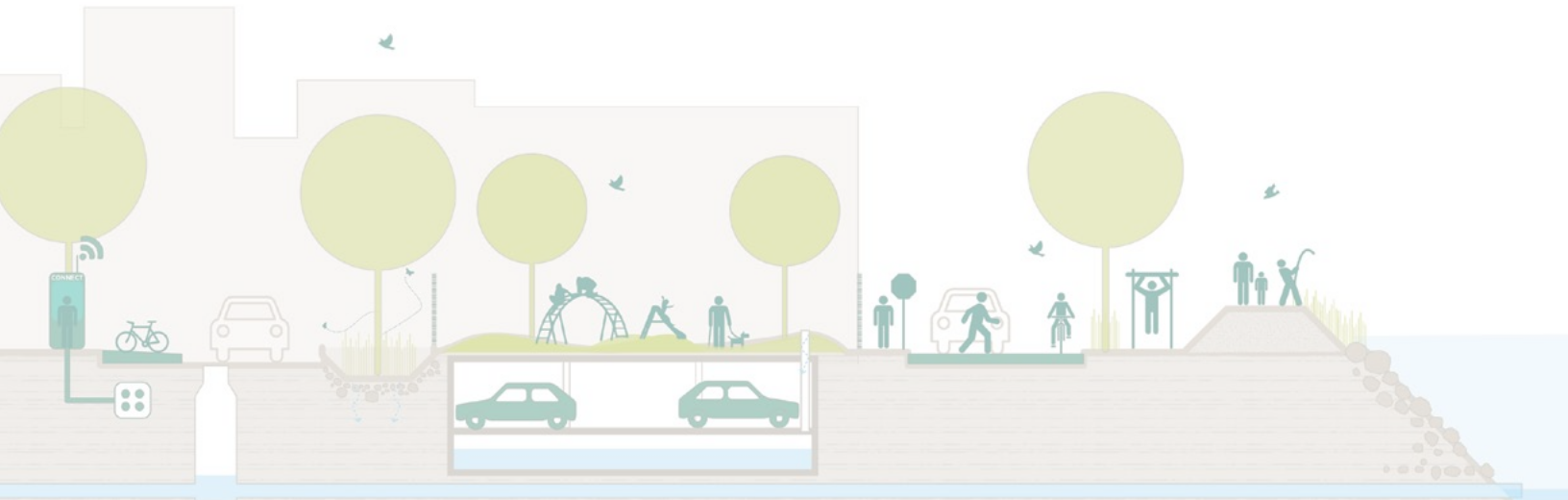
The network of sewers, pipes, storm drains, and basins through which water flows in an urban environment until its ultimate destination at an outfall or stream.

Storm Surge

Water during a storm that, combined with normal tides, is pushed by strong winds toward land. This water often breaches up onto normally dry land, which can result in severe flooding in adjacent communities.

Stormwater Runoff

The excess water during a heavy rainfall event or snowmelt that is left to flow throughout streets and sidewalks when storm drains have been filled to capacity and there is no available permeable surface area for infiltration. Guided by gravity and topography, it often contacts and transports pollutants in streets such as motor oils, nutrients from fertilizers, and human and animal waste and discharges them directly into nearby streams or rivers.



TACTICS FOR UNLOCKING RESOURCES

CSO+ WEB LINKS TO LEARN MORE

General

- re:focus partners:
  http://www.refocuspartners.com/
- SCAPE:
  http://www.scapestudio.com/
- New Jersey Future:
  http://www.njfuture.org/
- Build it Green:
  http://www.njfuture.org/issues/environment-and-agriculture/water-sewer/water-infrastructure/build-it-green-competition/
- Geraldine R. Dodge Foundation:
  http://www.grdodge.org/
- New Jersey Health Initiatives:
  http://www.njhi.org/
- New Jersey Environmental Infrastructure Trust:
  https://www.njeit.org/

CSO+ Public Housing

- Bronx River Houses (New York, NY):
  http://the-atlas.com/project?id=263
- Mariposa-Lincoln Park Public Housing Redevelopment (Denver, CO):
  http://www.the-atlas.com/project?id=265
- Department of Housing and Urban Development (HUD):
  https://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs

CSO+ Economic (Re)Development

- Glashaus Green Infrastructure (Emeryville, CA):
  http://www.the-atlas.com/project?id=264
- The Grand River Urban Waters Federal Partnership (Grand Rapids, MI):
  https://www.epa.gov/urbanwaterspartners/grand-rivergrand-rapids-michigan
- Historic 4th Ward Park (Atlanta, GA):
  http://www.communityresilience-center.org/wp-content/uploads/2016/04/Day2_Living_with_Water.pdf
- Rutgers University Small Business Development Center:
  http://www.business.rutgers.edu/rnsbdc
- Economic Development Agency (US Department of Commerce):
  https://www.eda.gov/funding-opportunities/

CSO+ Energy Efficiency

- Bronx Blue-Green Roof (New York, NY):
  http://the-atlas.com/project?id=271
- Blue and Green Roof Pilot Project (New York, NY):
  http://www.the-atlas.com/project?id=273
- US Department of Energy PACE:
  https://energy.gov/eere/slsc/property-assessed-clean-energy-programs
- Example of PACE-focused NGO:
  http://pacenation.us/what-is-pace/

CSO+ Schools

- Green Schools Program (Philadelphia, PA):
  http://www.phillywatersheds.org/what_were_doing/green_infrastructure/programs/greenschools
- List of State Resources (Department of Education):
  https://www2.ed.gov/programs/greenribbon-schools/resources-for-schools.html
- US EPA Environmental Education Grants:
  https://www.epa.gov/education/environmental-education-ee-grants

CSO+ Broadband and Internet Access

- Broadband Internet Public-Private-Partnership (Rockport, ME):
  http://www.the-atlas.com/project?id=270
- Big Broadband (Urbana-Champaign, IL):
  http://www.the-atlas.com/project?id=268
- BroadbandUSA:
  https://www2.ntia.doc.gov/
- National Telecommunications & Information Administration:
  https://www.ntia.doc.gov/category/grants
- Broadband Technologies Opportunities Program:
  https://www.ntia.doc.gov/category/broadband-technology-opportunities-program
- State Broadband Initiative:
  https://www2.ntia.doc.gov/SBDD

CSO+ Watershed Protection

- DC Clean Rivers Project (Washington, D.C.):
  http://www.the-atlas.com/project?id=266

CSO+ Parking

- US Bank Stadium West Plaza Stormwater Solution (Minneapolis-St. Paul, MN):
  http://www.the-atlas.com/project?id=267
- Library Low Impact Development (Santa Monica, CA):
  http://www.the-atlas.com/project?id=272

CSO+ Streets

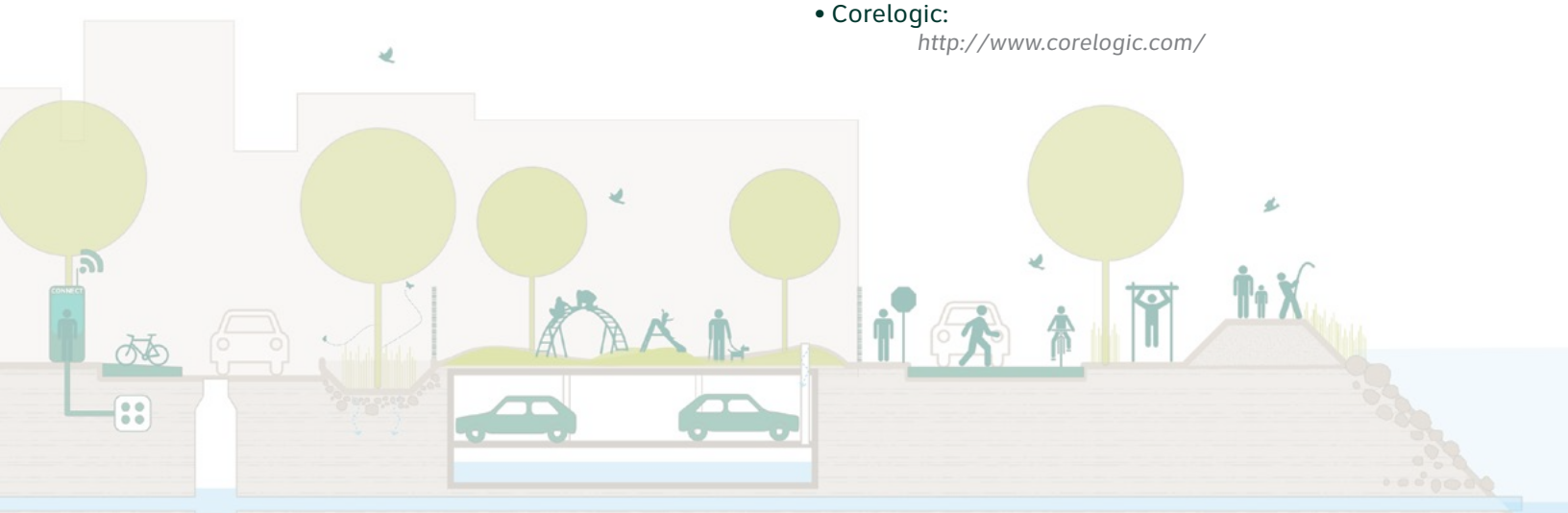
- Ocean Park Boulevard Green Street (Santa Monica, CA):
  http://www.the-atlas.com/project?id=274
- Transportation Alternatives Program (US Department of Transportation):
  https://www.fhwa.dot.gov/environment/transportation_alternatives/
- Transportation Alternatives Program (New Jersey Department of Transportation):
  http://www.state.nj.us/transportation/business/localaid/alternatives.shtm
- New Jersey SAGE:
  https://njsagelegacy.intelligrants.com/portal/search.aspx)

CSO+ Public Health

- The Asthma Impact Model (Fresno, CA):
  http://www.fresnobee.com/news/local/article19648842.html
- Social Impact Bonds:
  https://www.americanprogress.org/issues/economy/reports/2014/02/12/84003/fact-sheet-social-impact-bonds-in-the-united-states/

CSO+ Coastal Protection

- New York Metropolitan Transportation Authority:
  http://www.bondbuyer.com/news/marketsbuy-side/green-bonds-rise-as-tool-for-waterinfrastructure-resilience-1122864-1.html
- RE.bound Report:
  http://www.refocuspartners.com/reports/RE.bound-Program-Report-December-2015.pdf
- RMS:
  http://www.rms.com/
- AIR:
  http://www.air-worldwide.com/
- Corelogic:
  http://www.corelogic.com/



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SCAPE

NEW JERSEY FUTURE