

Developing Green Infrastructure Typologies: Community Planning for a Resilient Caño Martín Peña (San Juan, Puerto Rico)



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The views expressed in this presentation are those of the authors and do not necessarily reflect the views or policies of the U.S. Environmental Protection Agency.



- Background on the Caño Martín Peña and Proyecto ENLACE del Caño Martín Peña
- EPA & the Caño Martín Peña
- EPA's Smart Growth Implementation Assistance Program
- Community Design Process & Concept Designs
- Current Status and Next Steps





A Changing Landscape

Caño Martín Peña, 1936



Tres puentes sobre el Caño 1948



Caño Martín Peña, 2002



Existing Conditions



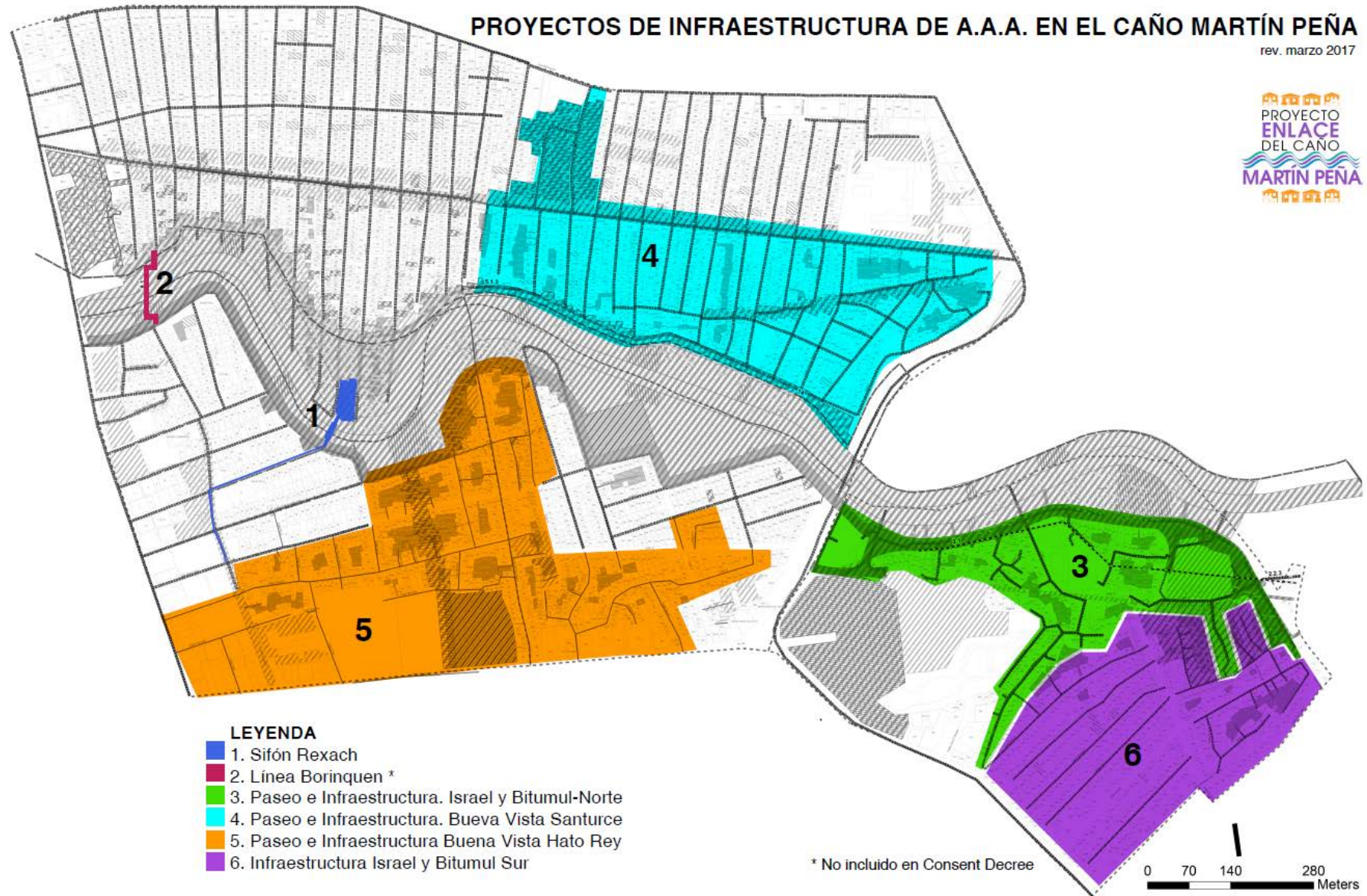
Neighborhoods in the CMP face higher rates of frequent flooding



Areas Without Sanitary Sewer System (2014)



Neighborhoods in the CMP face higher rates of frequent flooding (World Habitat, 2015)



Planning-Action-Reflection



Community • Advisory Board • Private Sector Partners • Government



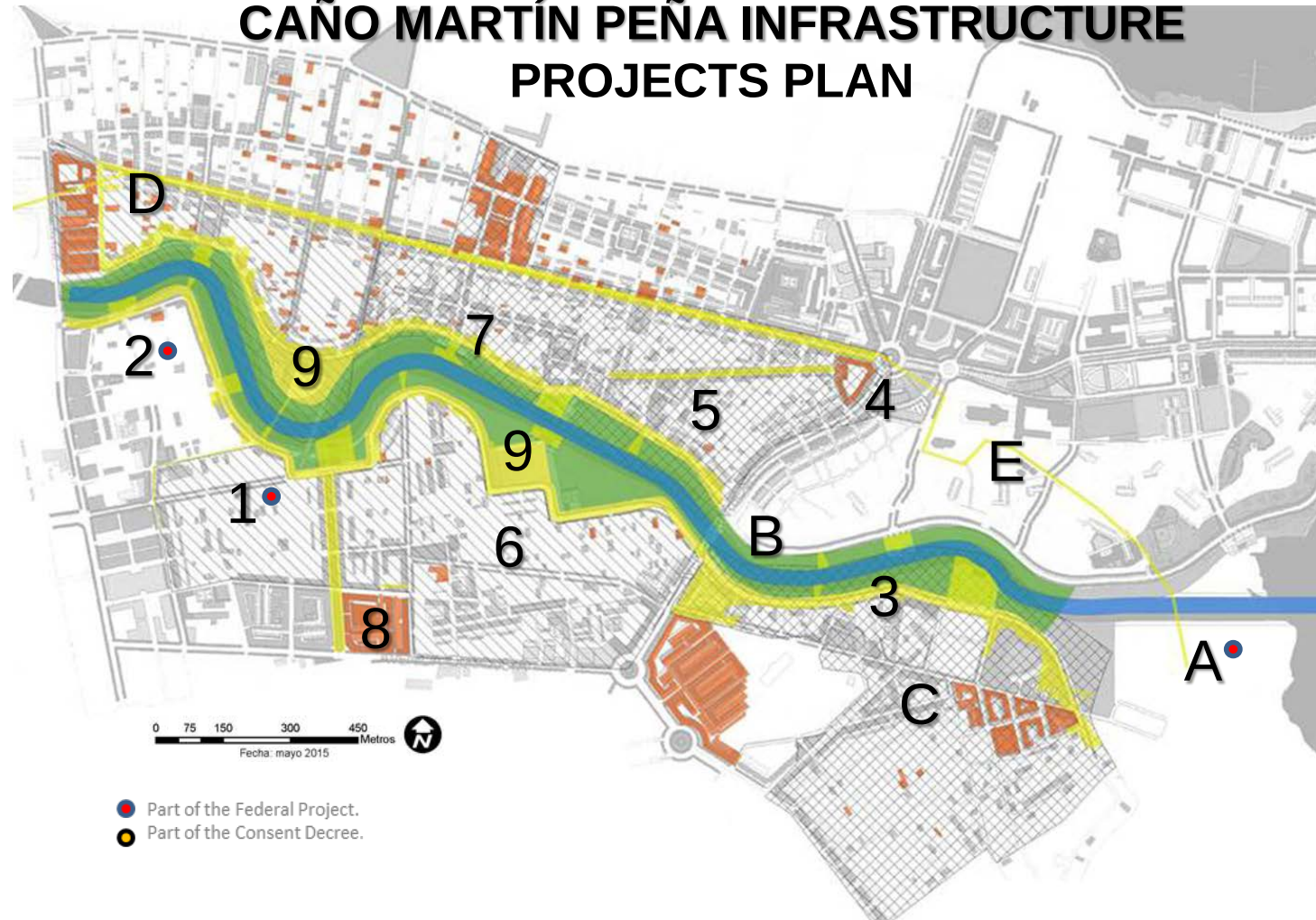
“...Y POR PRIMERA VEZ
LOS RESIDENTES FUIMOS ACTORES
DE NUESTRO FUTURO.”

Proyecto ENLACE del Caño Martín Peña



- Comprehensive Development Plan
- Law 489-2004

CAÑO MARTÍN PEÑA INFRASTRUCTURE PROJECTS PLAN



COMPLETED PROJECTS

- A** Lift 115Kv Power line
- B** Relocate Barbosa Bridge
- C** Reinforce the San José Sewer Trunk
- D** Barrio Obrero Marina Vacuum Sanitary
- E** Infrastructure in the Cantera Peninsula

SHOVEL READY

- 1** Relocation Rexach Syphon
- 2** Relocation Borinquen Water Transmission Line
- 3** Paseo and Infrastructure: Israel Bitumul – Phase I (North)
- 4** Barbosa Ave. Relocation (Phase II – Segment IV)

OTHER CRITICAL PROJECTS

- 5** Paseo and Infrastructure North of the Martín Peña Tidal Channel
- 6** Paseo and Infrastructure in BV-HR, Las Monjas and Parada 27
- 7** 115 kW Transmission Power Line (Underground) - Phase II
- 8** Solar Powered Communities in the Caño Martín Peña
- 9** Buena Vista Hato Rey2 & Barrio Obrero Marina* Baseball Parks

Fideicomiso de la Tierra

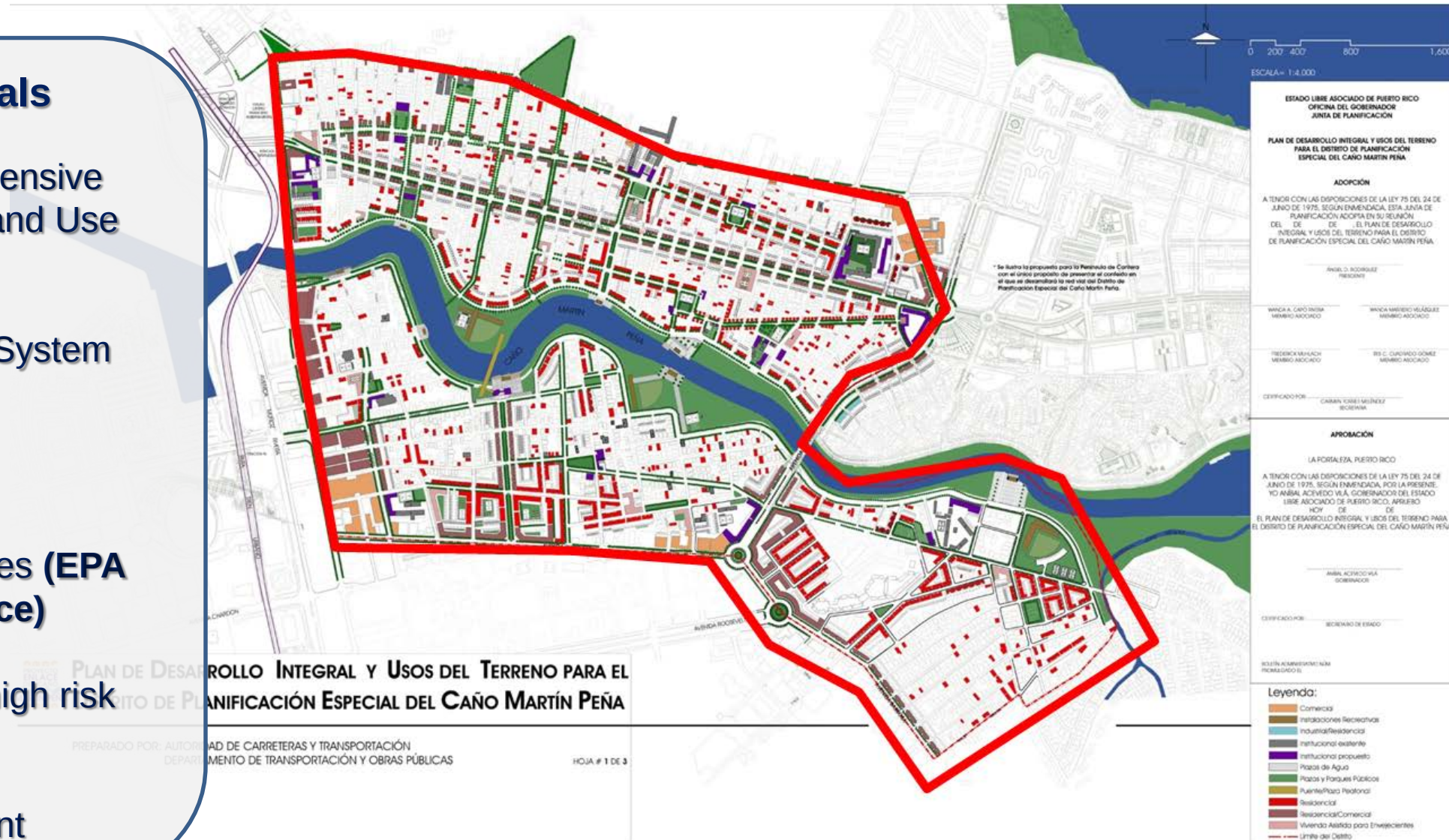
- Economic development
- Land ownership
- Prevents gentrification
- Reduces costs
- International model



Comprehensive Development and Land Use Plan For The Caño Martín Peña Special Planning District

Community Goals

1. Implement Comprehensive Development and Land Use Plan.
2. Implement Sewage System
3. Dredge the Channel
4. *Design Stormwater Management Facilities (EPA Technical Assistance)
5. Relocate homes in high risk flood zones
6. Prevent Displacement



Urban Waters Partnership

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Urban Waters Partnership Home

About the Urban Waters Partnership

19 Designated Urban Waters Locations

Anacostia Watershed (DC/MD)

Bronx and Harlem River Watersheds (NY)

Caño Martín Peña (PR)

Grand River/Grand Rapids (MI)

Greater Philadelphia Area / Delaware River Watershed (PA, NJ, DE)

Green-Duwamish Watershed (Washington)

Lake Pontchartrain Area / New Orleans (LA)

Los Angeles River Watershed (CA)

The Meramec River and Big

Urban Waters and the Caño Martín Peña (Martín Peña Channel, Puerto Rico)

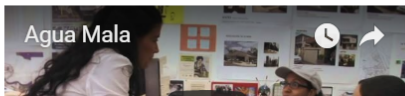
*** Congratulations to the Caño Martín Peña Land Trust, a member of this Urban Waters Partnership, on recieving the 2015 United Nations World Habitat Award! ***

[Read more about the Land Trust and their award.](#)

EXIT



- [View a larger version of this image.](#)
- [Photo Gallery](#)



The Martín Peña Channel is a 3.75 mile long tidal channel located within the San Juan Bay National Estuary in Puerto Rico, the only tropical estuary within the National Estuary Program.

During the early 20th century, substandard dwellings

Urban Waters - Caño Martín Peña:

<https://www.epa.gov/urbanwaterspartners/urban-waters-and-cano-martin-pena-martin-pena-channel-puerto-rico>

National Estuary Program:

<https://www.epa.gov/nep/overview-national-estuary-program>

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National Estuary Program (NEP)

National Estuary Program (NEP) Home

Basic Information about Estuaries

Overview of the NEP

Local Estuary Programs

Successful Watershed Management: NEP Lessons Learned

How NEPs Address Environmental Issues

Progress Evaluation

National NEP Results

NEP Library

Overview of the National Estuary Program

The National Estuary Program (NEP) is an EPA place-based program to protect and restore the water quality and ecological integrity of estuaries of national significance. Currently, 28 estuaries located along the Atlantic, Gulf, and Pacific coasts and in Puerto Rico are designated as estuaries of national significance. Each NEP focuses within a study area that includes the estuary and surrounding watershed.

The NEPs are located in a variety of institutional settings, including state and local agencies, universities and individual nonprofits. In overseeing and managing the national program, EPA provides annual funding, national guidance and technical assistance to the local NEPs.

National Estuary Program Booklet



[National Estuary Program Booklet](#)

Cover photo credit: Mark Lagrange.

The NEP Booklet provides an overview of the program and describes how NEPs are collaborative, effective, efficient, and

Smart Growth Implementation Assistance

Goals:

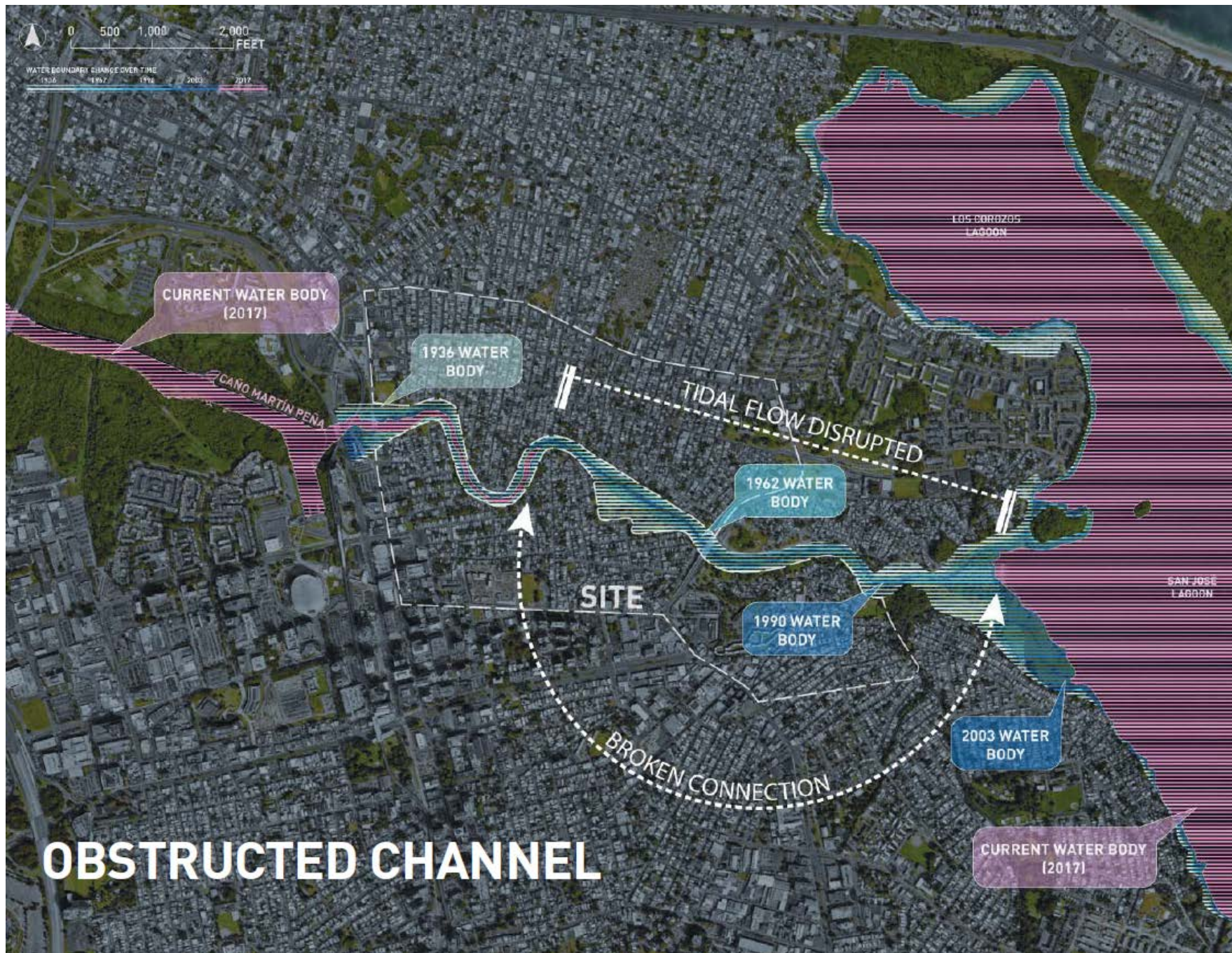
- Supporting communities interested in implementing smart growth policies.
- Identifying common barriers and opportunities for smart growth development.
- Creating tools other communities can use.

*Program Website: <https://www.epa.gov/smartgrowth/smart-growth-implementation-assistance>





HYDROLOGY

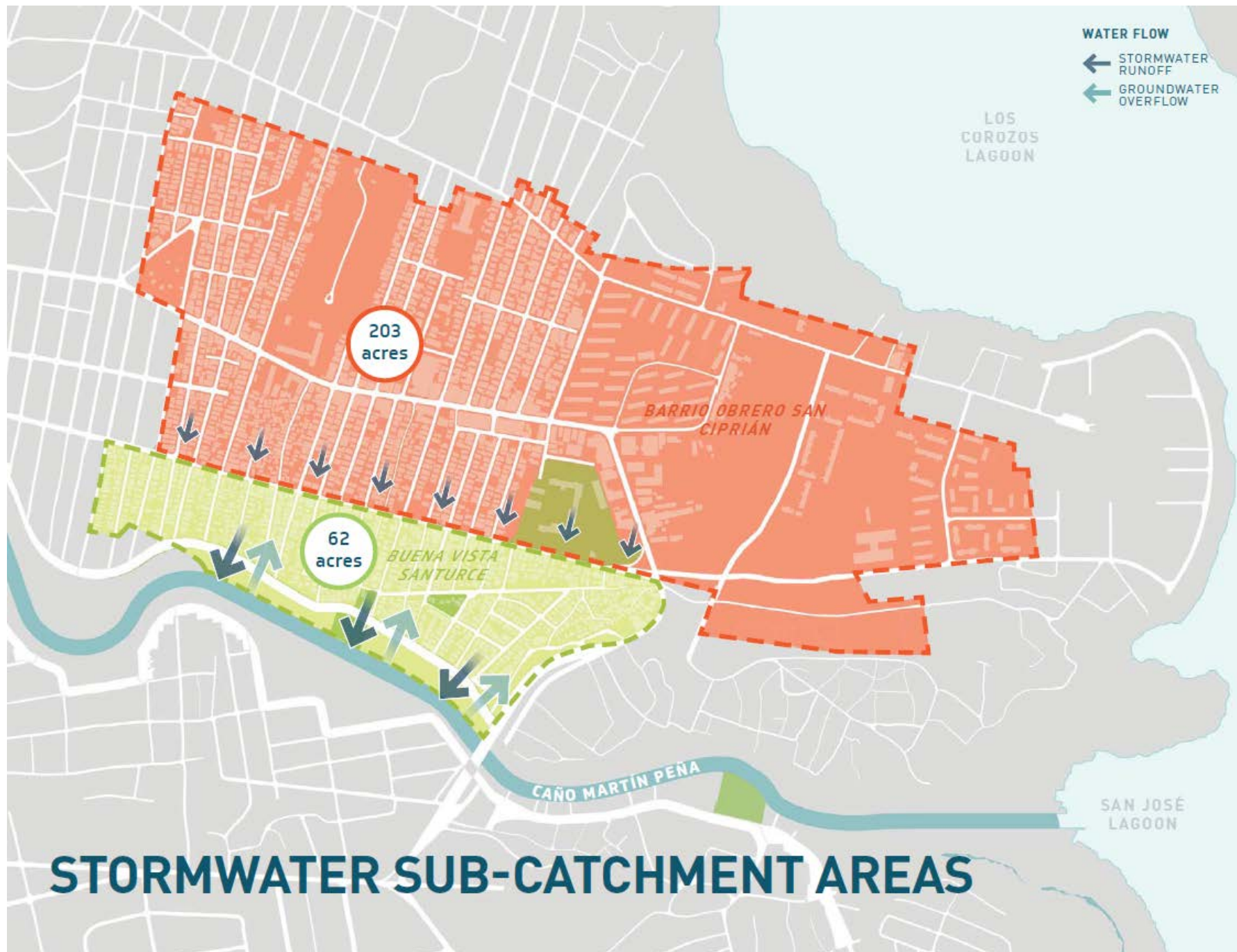


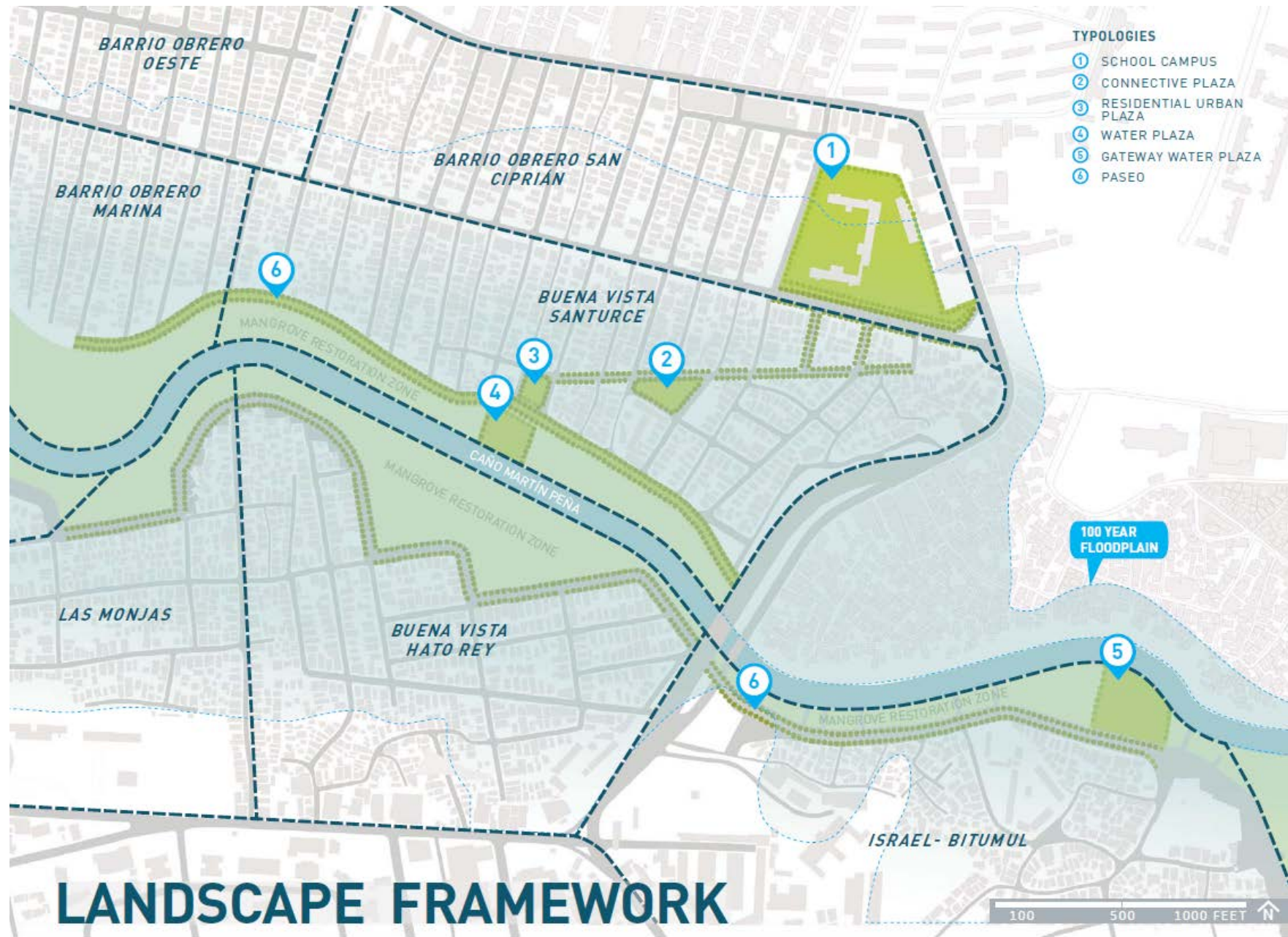


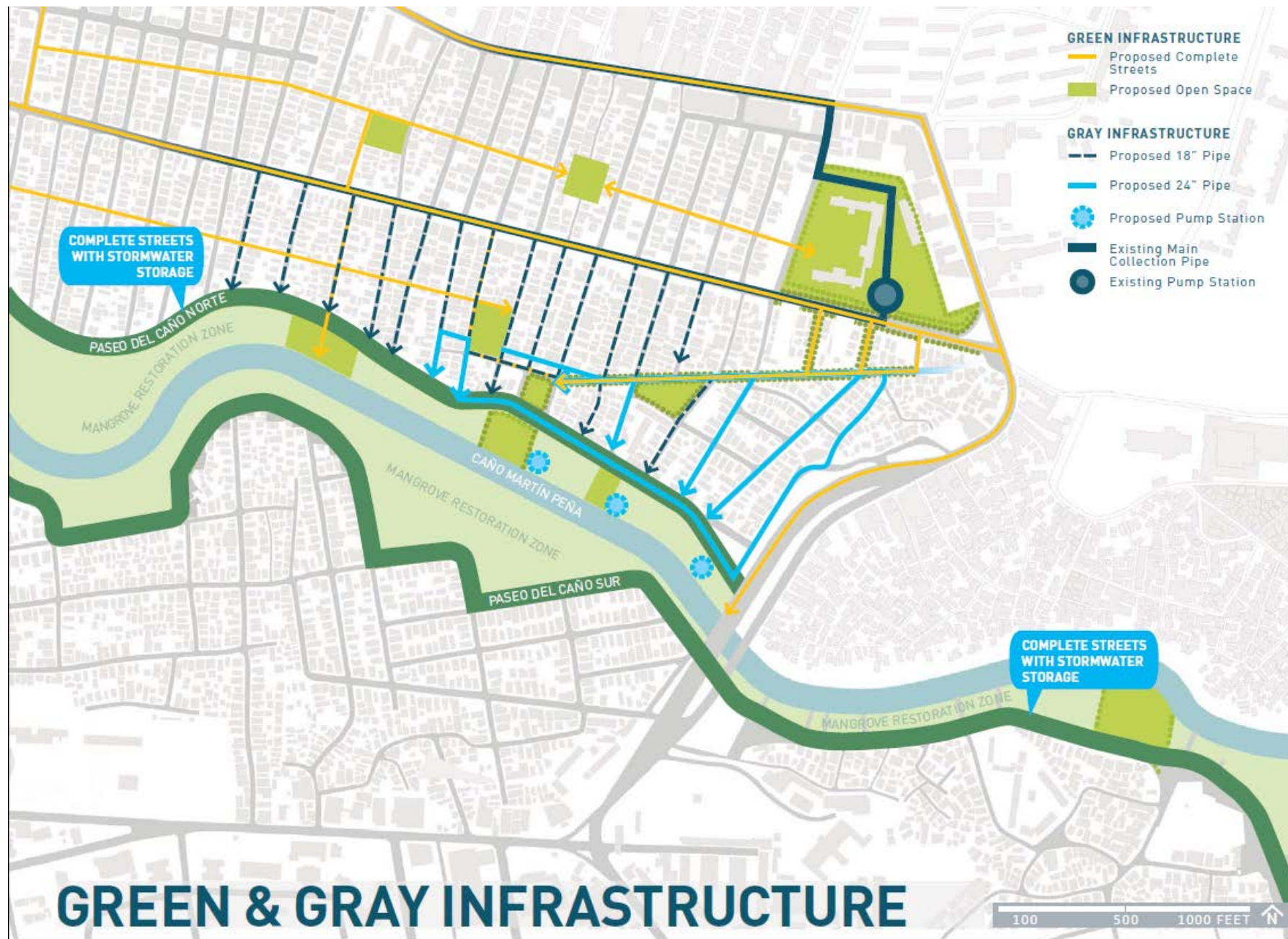


Caño Martín Peña and Flood Risk Maps









What We Heard

"WE NEED SPACE FOR LOCAL EVENTS LIKE PLENAZO AND CARRERA DEL PAVO"

"WE SHOULD CREATE AN INTERAGENCY COLLABORATION AGREEMENT TO MAINTAIN GREEN INFRASTRUCTURE"

"LET'S HAVE AN EDUCATION CAMPAIGN ABOUT HOW GREEN INFRASTRUCTURE WORKS"

"I WANT AN OUTDOOR CLASSROOM TO LEARN ABOUT CLIMATE CHANGE AND THE ENVIRONMENT"

"MAKE MORE SPACES ACCESSIBLE FOR DISABLED PEOPLE"

COMMUNITY ENGAGEMENT + THE DESIGN PROCESS



INITIAL DESIGNS



COMMUNITY FEEDBACK AND REVISIONS



CHARRETTE AND STAKEHOLDER MEETINGS



COMMUNITY FEEDBACK AND REVISIONS



FINAL PRESENTATION

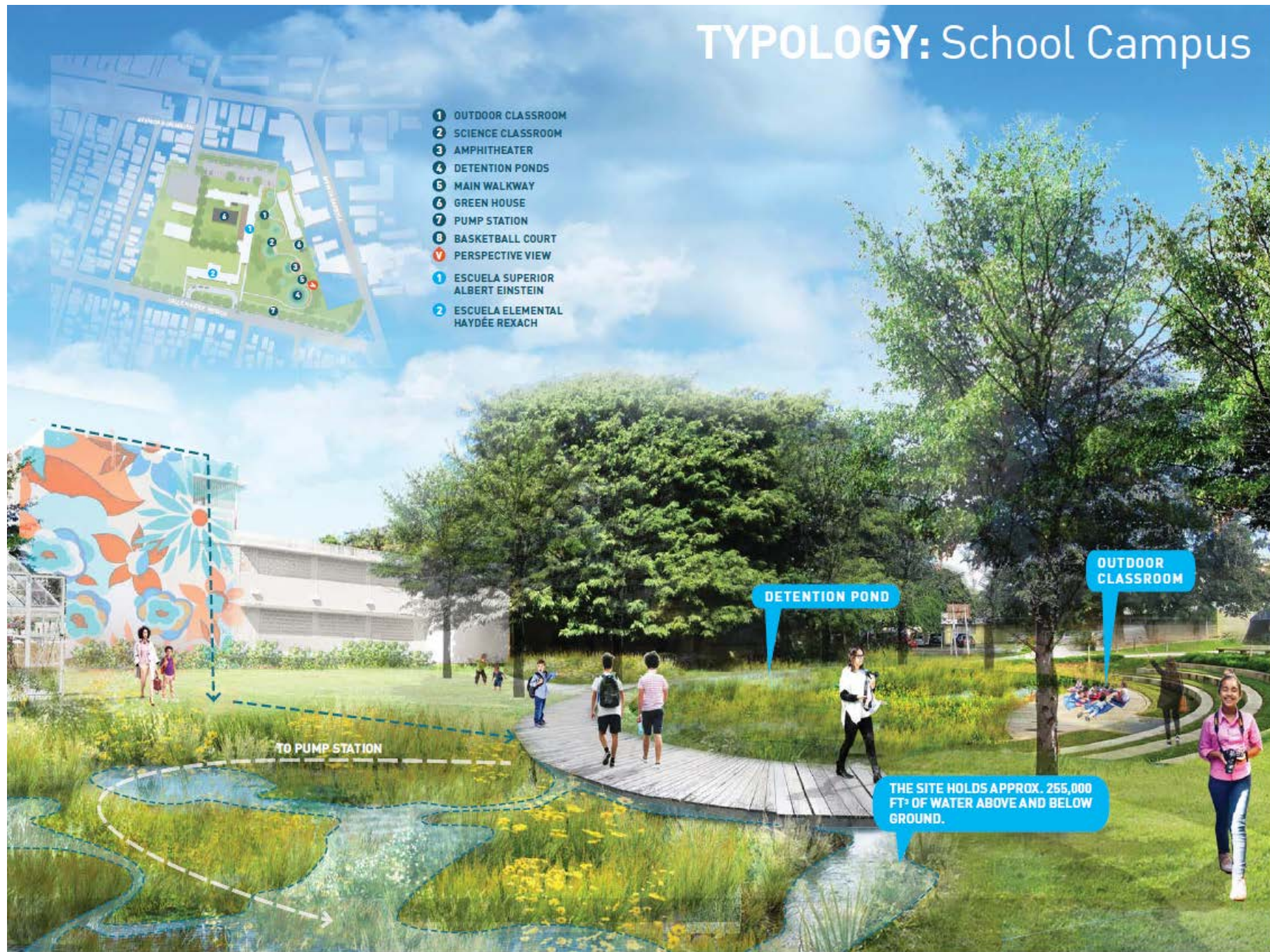


COMMUNITY FEEDBACK AND REVISIONS



FINAL REPORT

TYPOLGY: School Campus





TYPOLGY: Paseo

- 1 PASEO DEL CAÑO SUR
- 2 PASEO DEL CAÑO NORTE
- 3 MANGROVE RESTORATION ZONE



TREES PLANTED IN SOIL CELLS SEPARATE THE BIKE AND PEDESTRIAN TRAFFIC

MANGROVE RESTORATION ZONE

BIOSWALES DEFINE THE PASEO AND CAPTURE STORMWATER

GRAVEL UNDER ROADWAY FOR STORMWATER STORAGE

ICONIC PERMEABLE PAVERS





Next Steps

- **Sign agreement for \$3.31 million grant:**
 - State Revolving Fund (SRF) with the local SRF Program (PR Environmental Quality Board)
- **Publish Request For Proposal (RFP) that includes:**
 - Comprehensive Water Management Plan for the Northern Region of Caño Martín Peña (Design pre-development studies/H&H analysis of the channel)
 - Buena Vista & Sector San Ciprián SSS & Storm Water Sewer System - San Juan (Design)
 - Baseball Park and Subsoil improvements & Storm Sewer Control of Buena Vista Community (Design & Construction)
- **Sharing lessons learned with other communities**
- **Challenges:**
 - Coordinating with the USACE on design and implementation of the water plazas.
 - Confirm the feasibility of design and implement Green Infrastructure strategies taking in consideration; high water table, poor soil conditions, high densely populated area, cost and time frame limit, integration with comprehensive development plan and resilient and climate change goals.

Thank you!

**Smart Growth Implementation Assistance project report for the Caño Martín Peña
(English & Spanish):**

<https://www.epa.gov/pr/smart-growth-implementation-assistance-cano-martin-pena-san-juan-puerto-rico>

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