

ARCCA

Learning Session

Financing Infrastructure through Resilience Bonds

Wednesday, April 6th | 1:00-2:00pm PDT



Learning Session Agenda

- **Overview** of the Alliance of Regional Collaboratives for Climate Adaptation (ARCCA)
- **Feature Presentation** on Financing Infrastructure through Resilience Bonds
- **Discussion** with the ARCCA Executive Committee
- **Q&A** with Webinar Participants

Webinar Logistics

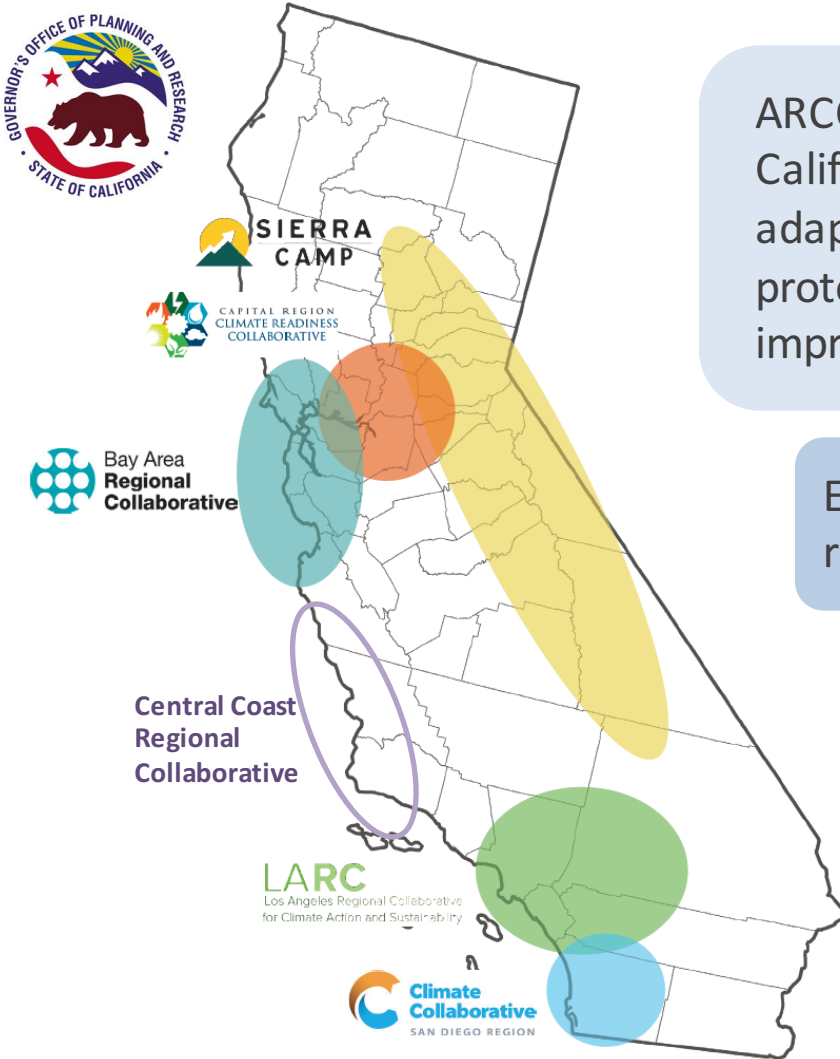
Questions:

At any point during the webinar, you can type your question into the question text box and click send.

All questions directed towards a speaker will be read aloud and answered at the end of the presentations, as long as time permits.

The screenshot shows the GoToWebinar Control Panel window. It has a title bar with three colored buttons (red, yellow, green) and the text "GoToWebinar Control Panel". Below the title bar is a blue header bar with a downward arrow and the word "Audio". Under the "Audio" section, there is an "Audio Mode:" label with two radio buttons: "Use Telephone" (unselected) and "Use Mic & Speakers" (selected). Below this is a microphone icon, the word "MUTED" in red, a speaker icon, and a volume level indicator with seven small squares. Below the audio section is a "Talking:" label. Underneath is another blue header bar with a downward arrow and the word "Questions". Below the "Questions" header is a large empty text box for typing a question. At the bottom right of this text box is a "Send" button. Below the question text box is a grey bar with the text "Webinar Now" and "Webinar ID# 349-759-329". At the very bottom is the "GoToWebinar" logo.

About ARCCA



ARCCA is a **network of regional collaboratives** in California coordinating and supporting climate adaptation efforts to enhance public health, protect natural systems, build economies, and improve quality of life.

Engaging in **state policymaking** to advance a regional and holistic approach to adaptation.

Sharing **best practices and resources** to advance local efforts on the ground.

Encompassing over **80%** of the state's population.

Current Initiatives

- Projects with CivicSpark
 - Adaptation in Action Roadmap for SB 379 Compliance
 - Whitepaper on the Urban-Rural Connection for Holistic Climate Change Adaptation
- Research Projects
 - CEC Natural Gas Regional Adaptation Studies
 - Overcoming Institutional and Financial Barriers to Climate Adaptation
- Calendar of climate change adaptation events
- Legislative tracking
- More information available at www.arccacalifornia.org

Featured Speaker



Shalini Vajjhala

Founder and CEO

re:focus partners

refocuspartners.org



Financing Infrastructure Through Resilience Bonds

Shalini Vajjhala
ARCCA Learning Session
April 6, 2016

The High Cost of Infrastructure Failure



Image credit: [weather.gov](https://www.weather.gov)

insuring for resilience.

Designing & Financing for Resilience



Image credit: [Instagram \(paulphootrakul\)](#)



Lucy Nicholson / Reuters



AP Photo/Mike Meadows

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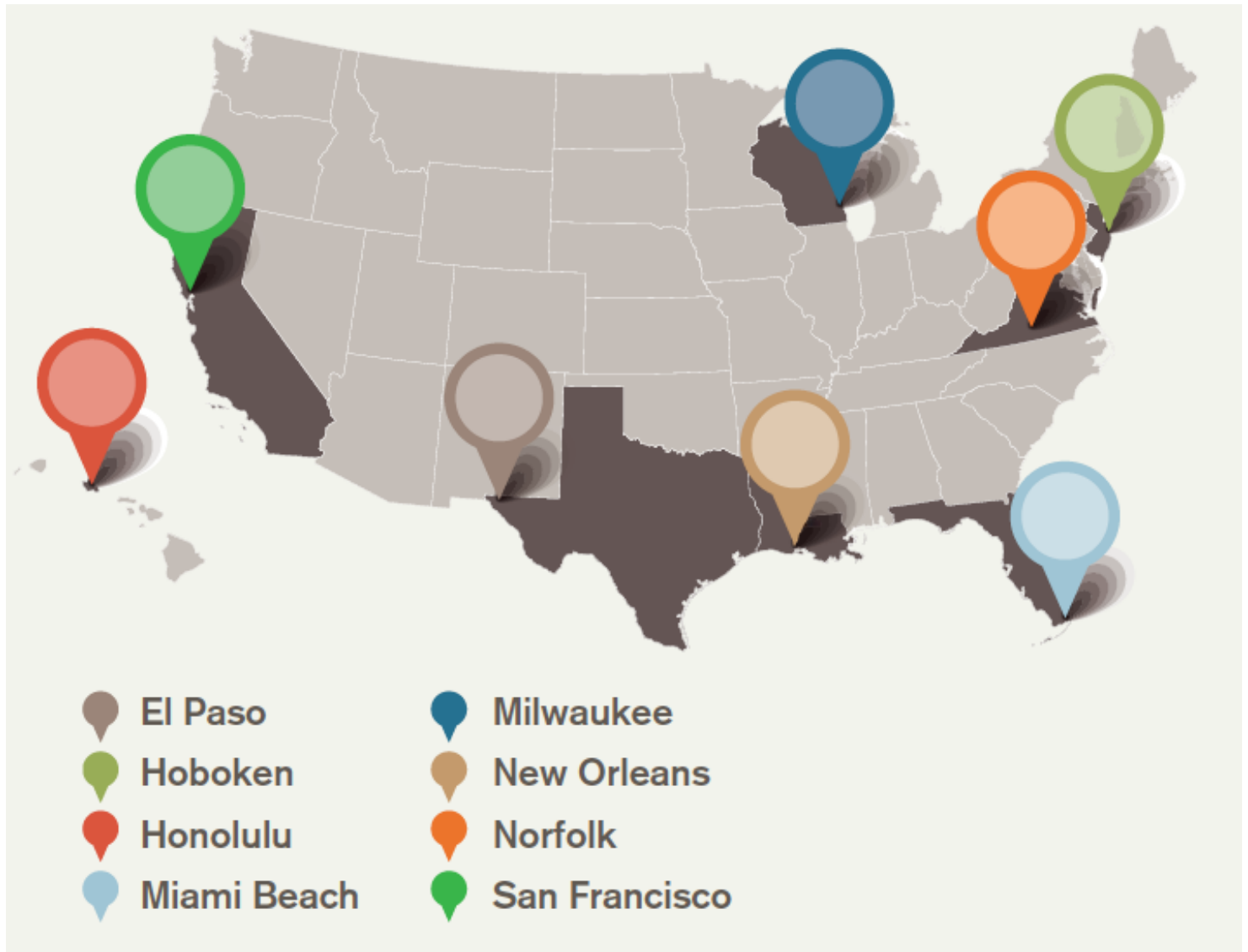
Infrastructure as Financial Risk Reduction

- Resilient infrastructure is designed to reduce risk
 - Public sector assets & services are safer
 - AND insurance companies lose less money when public & private policy holders are better protected
- Resilience Bonds are one way of ensuring the *financial* value created by these public investments returns to the public sector





Investing in Resilience



insuring for resilience.



HOBOKEN, NJ

STORMWATER STORAGE + PARKING + GREEN INFRASTRUCTURE



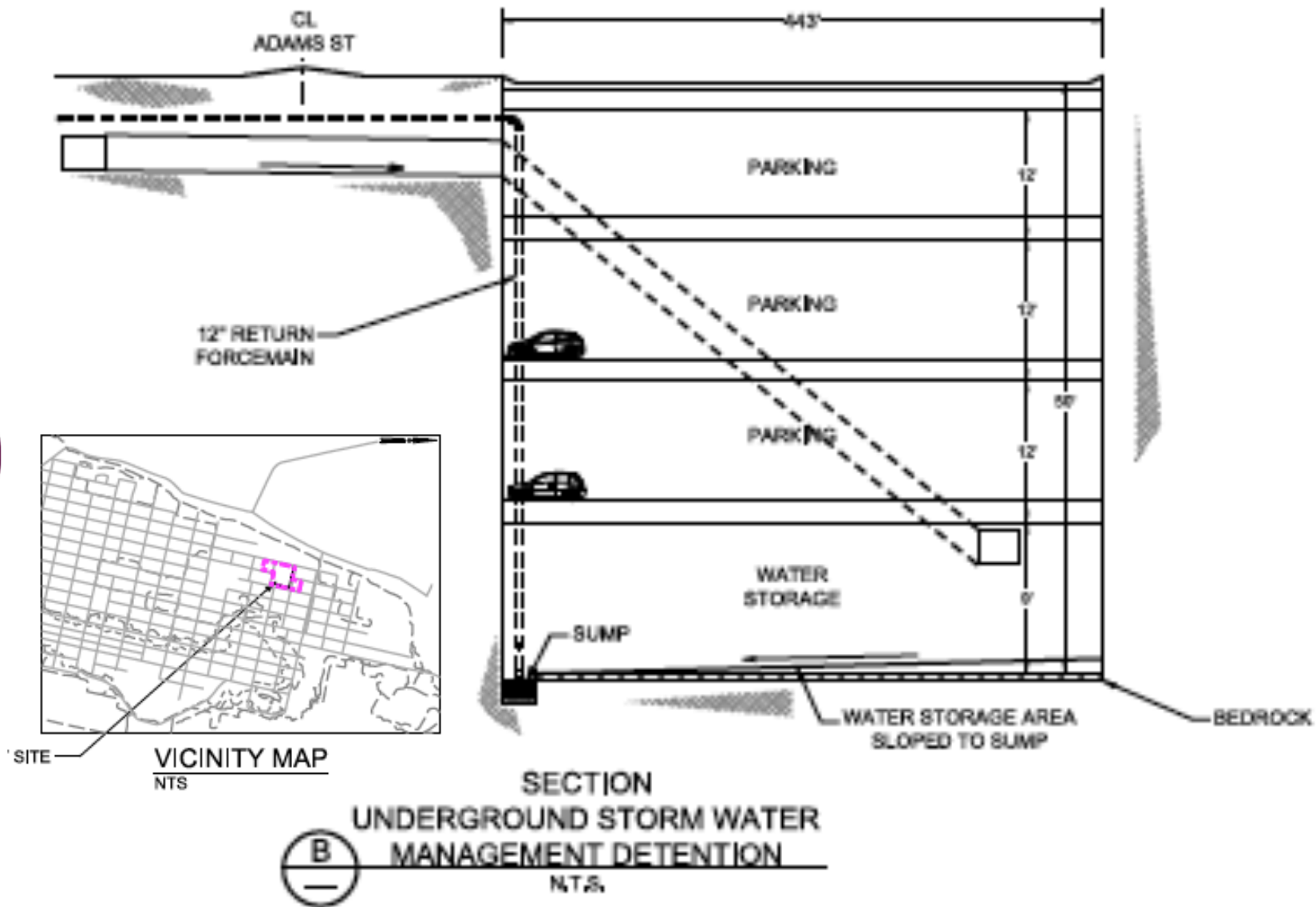
Population: 55,000 (2010 Census)
Area: 1 sq. mi.

Hoboken is a riverfront community prone to flooding when heavy rain events coincide with high tides. The City has several interrelated challenges including local flooding, aging infrastructure, and an overflowing combined stormwater and sewer system - all of which are exacerbated by increasing storm frequency, greater storm surges, and rising sea levels.



Hoboken Flood Map & Depth to Bedrock

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HOBOKEN, NJ

STORMWATER STORAGE + PARKING + GREEN INFRASTRUCTURE

| Scenario | Total Price (\$M) | Excavation (CYD) | Excavation (CYD) | Waterproofing (SFT) |
|--------------------------------------|-------------------|------------------|------------------|---------------------|
| 4 Levels Parking | 114.9 | 314,202 | 68,902 | 252,269 |
| 3 Levels Parking & 1 Level Storage | 117.3 | 314,202 | 69,811 | 252,269 |
| 2 Levels Parking & 2 Levels Storage | 125.4 | 314,202 | 83,193 | 252,269 |
| 1 Level Parking & 3 Levels Storage | 131.2 | 314,202 | 96,501 | 252,269 |
| Smaller Scenarios | | | | |
| 1 Level Parking & 1 Level Storage | 85.7 | 188,521 | 188,521 | 252,269 |
| 2 Levels Parking & 1 Level Storage | 102.7 | 238,793 | 238,793 | 252,269 |
| 1- story Water Retention Only (1MG) | 12.8 | - | - | - |
| 1- story Water Retention Only (5MG) | 26.7 | - | - | - |
| 1- story Water Retention Only (10MG) | 47.3 | - | - | - |



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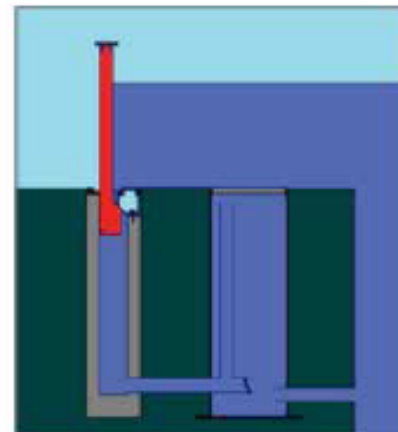
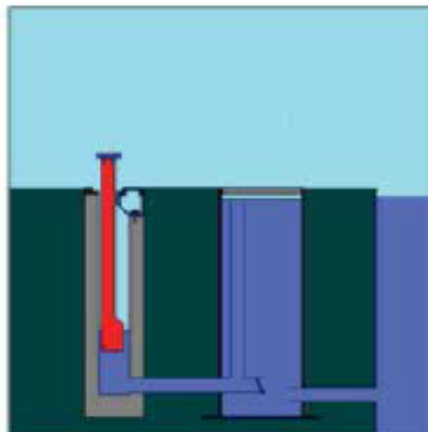
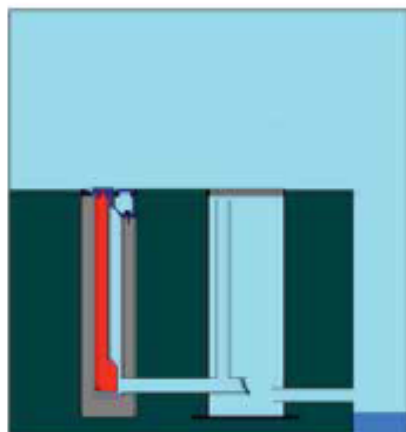


NORFOLK, VA

FLOOD BARRIERS + GREEN INFRASTRUCTURE

| | NO. OF FLOODED STRUCTURES | AREA OF FLOODED STRUCTURES (SQ. FT.) | NO. OF STRUCTURES SAVED | AREA OF BUILDINGS REMOVED FROM FLOODING (SQ. FT.) | VOLUME WATER HELD BACK (CU. FT.) |
|--------------------------|---------------------------|--------------------------------------|-------------------------|---|----------------------------------|
| 100-Year Flooding (7.6') | 465 | 1,997,466 | - | - | 11,095,891 |
| Phase 1 (4.0') | | | 13 | 60,026 | 181,543 |
| Phase 1 (5.0') | | | 31 | 346,128 | 1,036,270 |
| Phase 1 (5.75') | | | 50 | 480,535 | 2,075,712 |
| Phase 2 (4.0') | | | 13 | 60,026 | 223,774 |
| Phase 2 (5.0') | | | 46 | 389,881 | 1,322,158 |
| Phase 2 (5.75') | | | 85 | 647,418 | 2,738,156 |

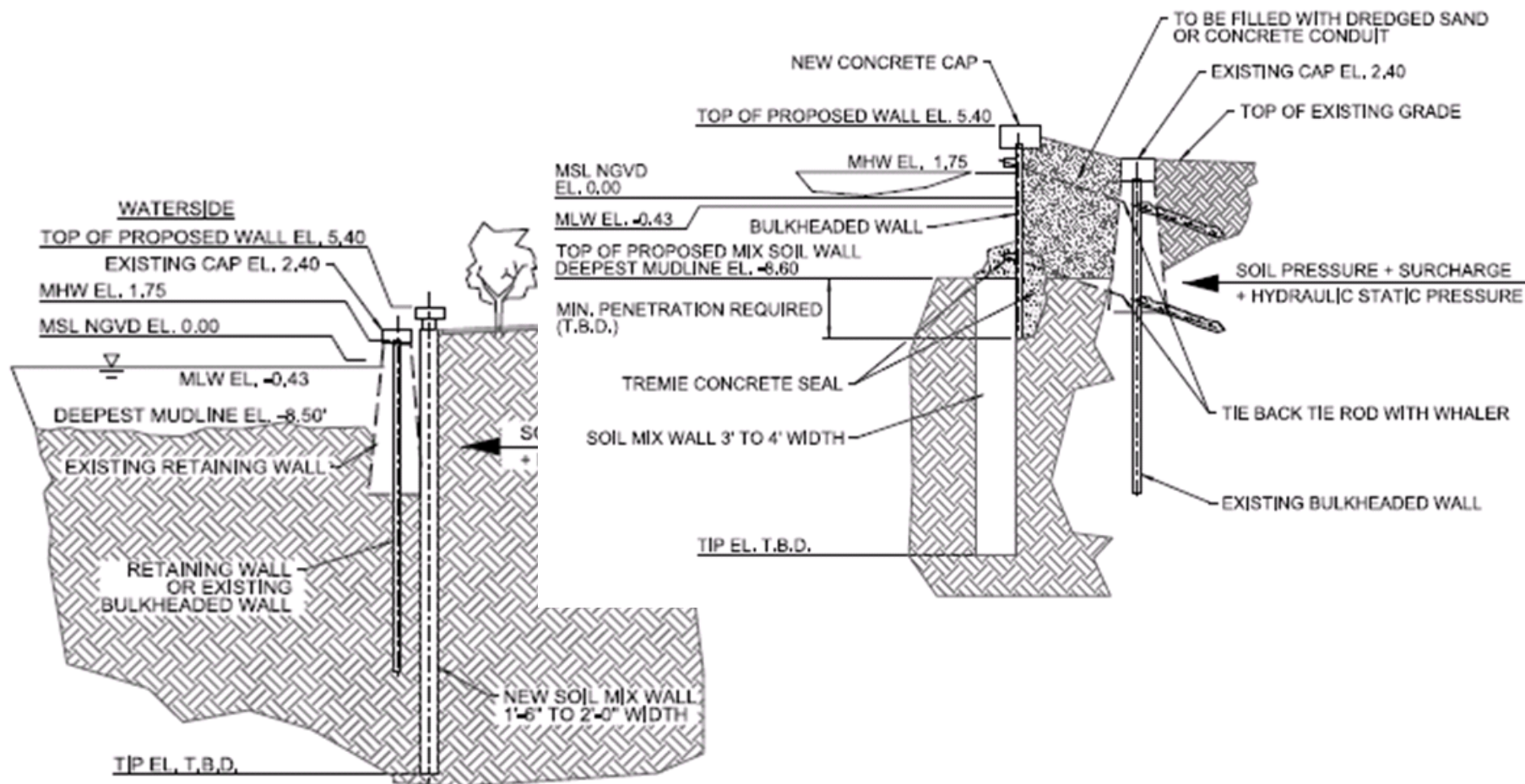
Table 2 - Summary of Flood Reductions due to Self-Closing Flood Barrier





MIAMI BEACH, FL

SEAWALL RETROFITS + FLOOD MANAGEMENT



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Overview of Resilience Bonds

Leveraging Private Finance for Resilience



- The Challenge: Funding Resilient Infrastructure
 - Public resources for infrastructure are limited
 - Benefits are diffuse & rarely linked to revenues
 - Success is often something that didn't happen
- The Opportunity: Resilience Bonds
 - Resilience Bonds can help close the loop
 - Create virtuous cycle of risk reduction investments





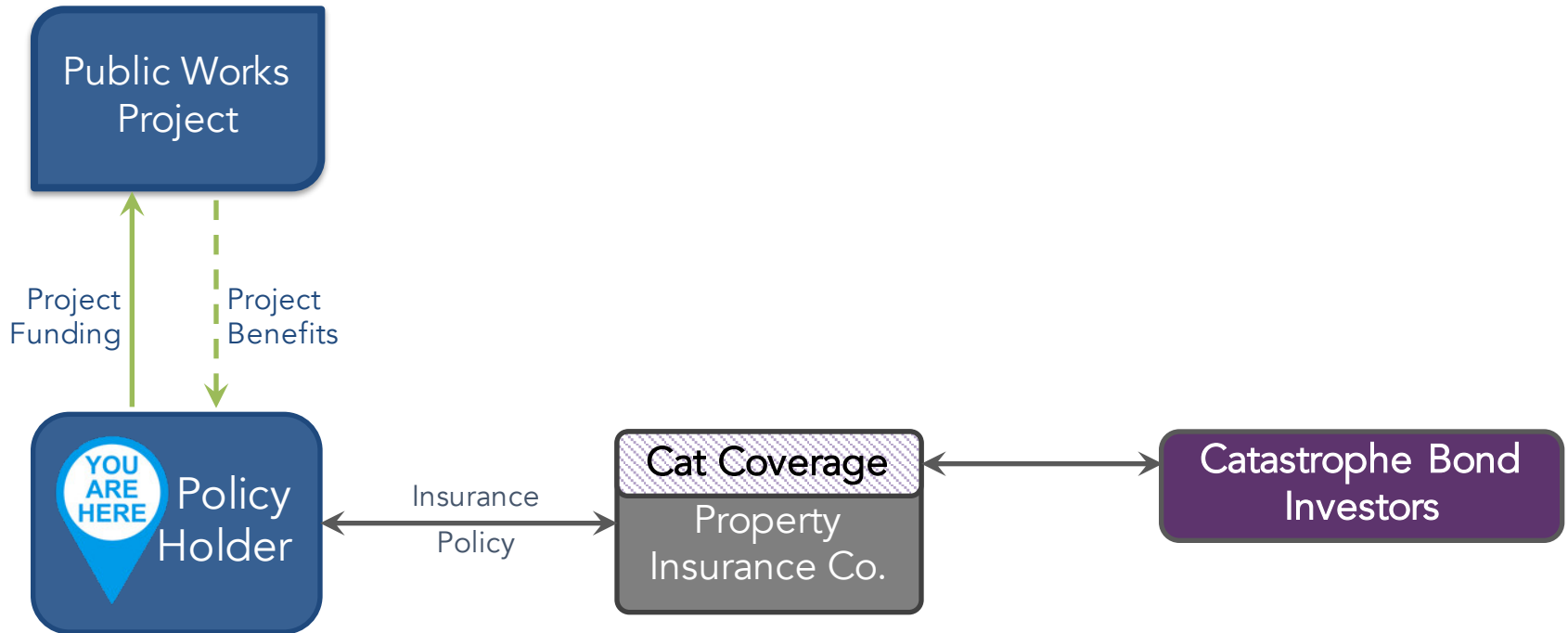
How Resilience Bonds Work



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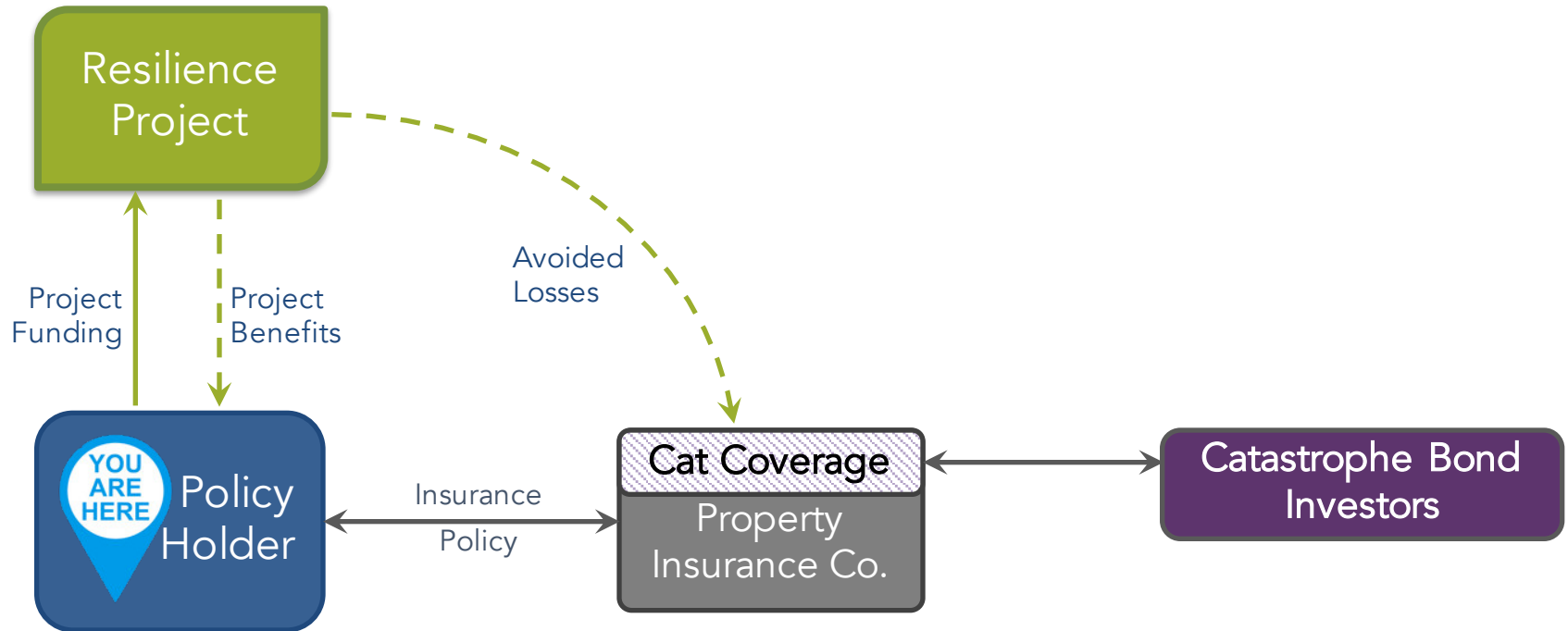
How Resilience Bonds Work



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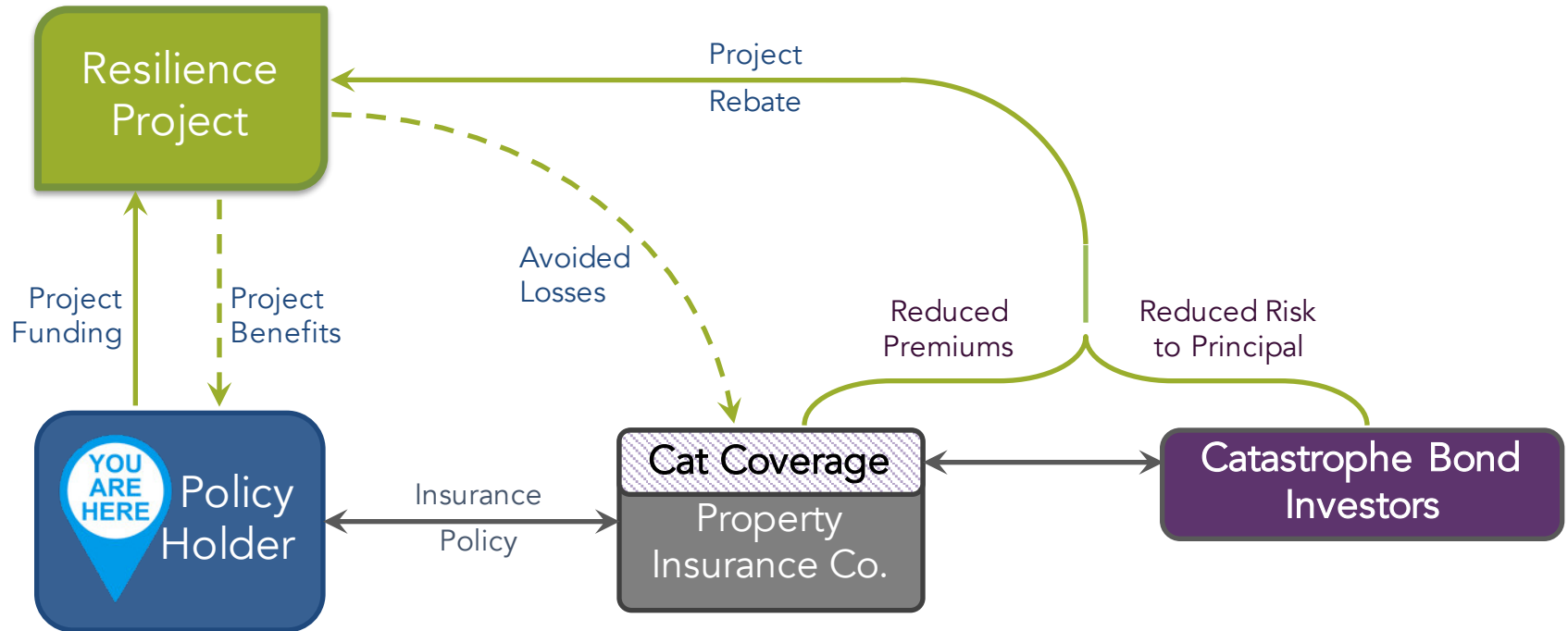
How Resilience Bonds Work



insuring for resilience.



How Resilience Bonds Work



insuring for resilience.

Benefits of Resilience Bonds



1. Fill Project Funding Gaps

- Rebates can fund future phases of projects
- Savings can cover O&M costs or addt'l insurance

2. Help Meet Insurance Compliance Obligations

- Existing federal disaster assistance requirements
- Potential new req's (i.e. FEMA Disaster Deductible)

3. Ensure Project Design Integrity

- Set design standards linked to risk reduction value
- Avoid value-engineering out key benefits

Is a Resilience Bond right for your project?

- Identify a potential project & risk reduction
- Talk to your Financial Advisor/Insurance Broker
- Follow-up to discuss:
 - Resilience & Insurance Priorities
 - Modeling Risk Reductions
 - Bond Design and Structuring Process
- For more information on Resilience Bonds see:

RE.bound Program Report at
www.refocuspartners.com





Questions?

Contact: info@refocuspartners.com

Thank You

- **To learn more about ARCCA:**
 - Visit www.arccacalifornia.org
 - Contact Julia Kim at jkim@lgc.org or (916) 448-1198 x304
- **To learn more about re:focus partners:**
 - Visit www.refocuspartners.org
 - Contact Shalini Vajjhala at info@refocuspartners.org
- **Stay tuned for our next Learning Session!**