
Great Water Cities
Summit 2017
Invest4Resilience
Water Environment Federation
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Great Water Cities Summit 2017

Invest4Resilience

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the water quality people®

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LEADING THE WAY IN WATER QUALITY MANAGEMENT

IWA
the international water association

NYC Environmental Protection

NEW YORK STATE OF OPPORTUNITY. Environmental Facilities Corporation

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Great Water Cities Summit 2017 Invest4Resilience

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#GWC2017NY

Include the official hashtag in your tweets

NYWEA

LEADING THE WAY IN
WATER QUALITY MANAGEMENT

New York Water Environment Association

Spring Technical Conference & Exhibition

June 5-7, 2017 Rochester, NY

NYC Watershed Science & Technical Conference
September 13, 2017 Saugerties, NY

Great Water Cities Summit 2017 Invest4Resilience

IWA Water-Wise Cities Initiative

Key Upcoming Events

Water-Wise Cities in developed countries

Embrace the Water | June 12-14 | Gothenburg

www.embracethewater2017.com

Water-Wise Cities in emerging and developing economies

Water and Development Congress and Exhibition | November 13-16 | Buenos Aires

www.waterdevelopmentcongress.org

The Principles for Water-Wise Cities

1. Regenerative Water Services
2. Water Sensitive Urban Design
3. Basin Connected Cities
4. Water-Wise Communities

Five Building Blocks for Implementation

Vision | Governance | Knowledge & Capacity | Planning Tools | Implementation Tools

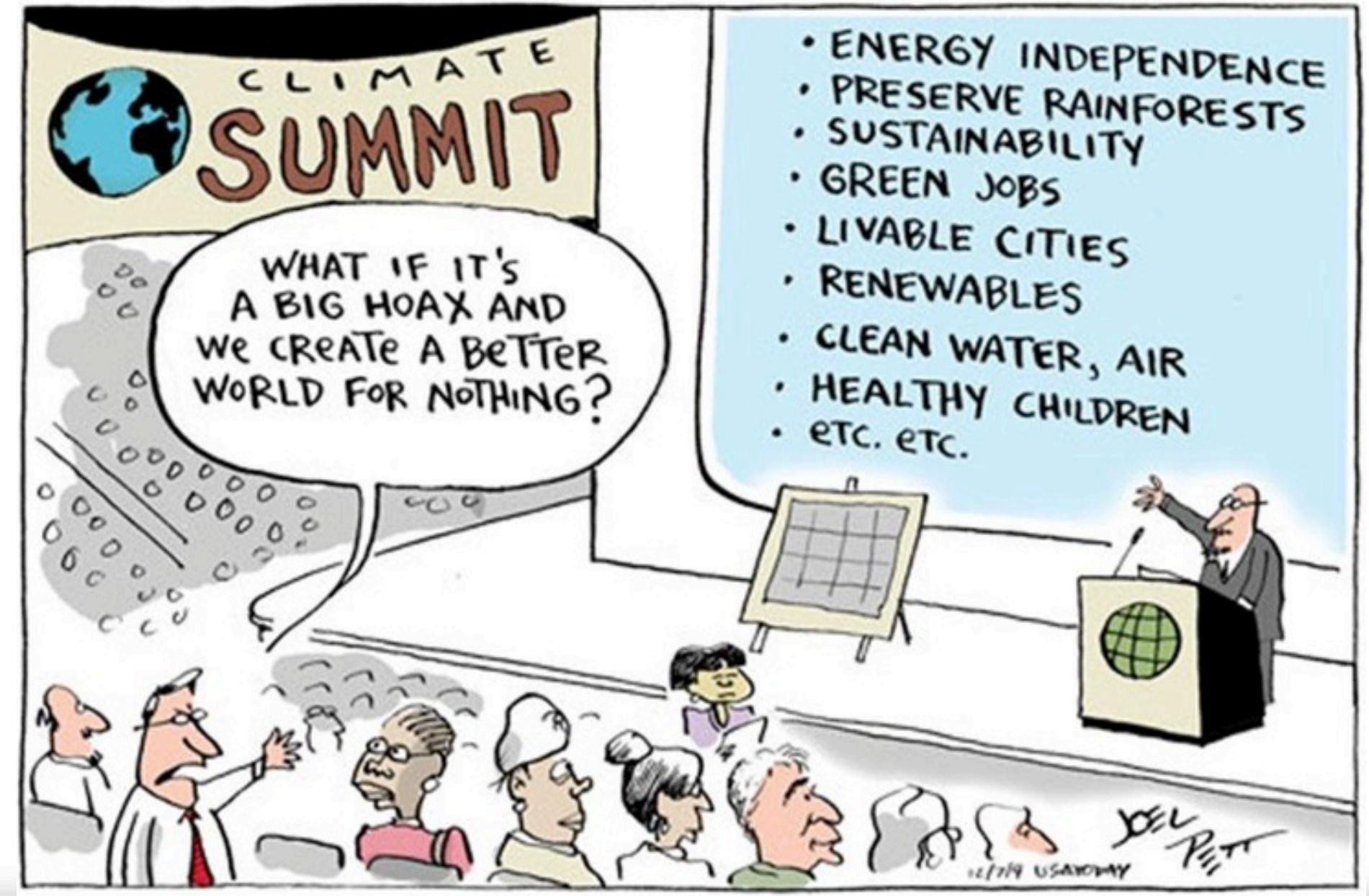
Great Water Cities Summit 2017 Invest4Resilience

Great Water Cities Summit 2017 Invest4Resilience

Deputy Commissioner Pam Elardo, P.E.

May 16, 2017

Great Water Cities Summit 2017 Invest4Resilience



Source: USA Today,

Residential/Commercial Wastewater

Industrial Wastewater

Stormwater

Food Waste

Process Water Reuse

ELECTRICITY
CoGen & Di-Gas Reuse

CLEAN Water

Fit-for-Purpose Water

Biosolids Products

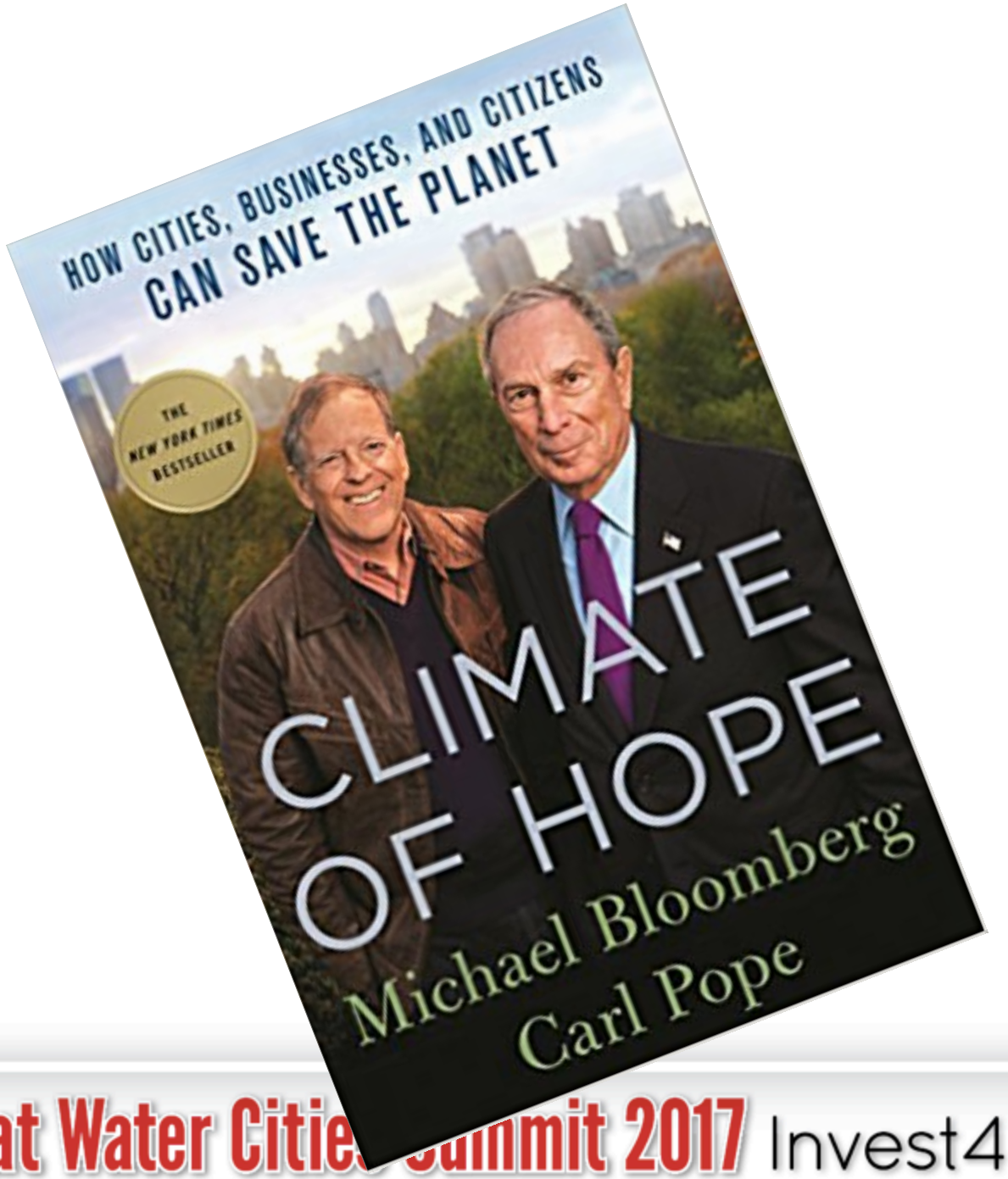
Renewable Energy

Next Generation Products
i.e., PHOSPHOROUS

Inputs
Raw Materials

Processing
Manufacturing

Outputs
Products


HOW CITIES, BUSINESSES, AND CITIZENS
CAN SAVE THE PLANET
THE NEW YORK TIMES BESTSELLER
CLIMATE OF HOPE
Michael Bloomberg
Carl Pope

8:40 - 9:00 AM | KEYNOTE ADDRESS

Lykke Leonardsen
Program Director Green City Solutions – City of Copenhagen

Lykke Leonardsen holds a Master's degree as an archaeologist and Master's degree in Public Policy. She is currently the Program Director for Resilient and Sustainable City Solutions in Copenhagen where she is responsible for the development and sharing of Copenhagen's work on creating a liveable city.

She has worked for the city of Copenhagen for nearly 20 years – in many different fields. This has included neighborhood regeneration, urban planning, parks and nature conservation and waste – and stormwater management. As part of her work she has been the driving force in the development of the Climate Adaptation Plan and the Cloudburst Management Plan for Copenhagen – a city-wide plan for controlling storm water in a 100-year storm – by using both green and grey surface infrastructure. The plan aims to use climate change adaptation for creating a greener and more liveable city. She has been instrumental in developing a strategy for integrating urban nature into the plan.

Currently, she is cooperating internationally with cities such as New York and Washington D.C., on sharing knowledge from Copenhagen's work with the Cloudburst Management Plan.

CLIMATE CHANGE IS REAL

Cloudburst management in Copenhagen

Great Water Cities Summit 2017 Invest4Resilience

A GROWING CITY

600.000 citizens

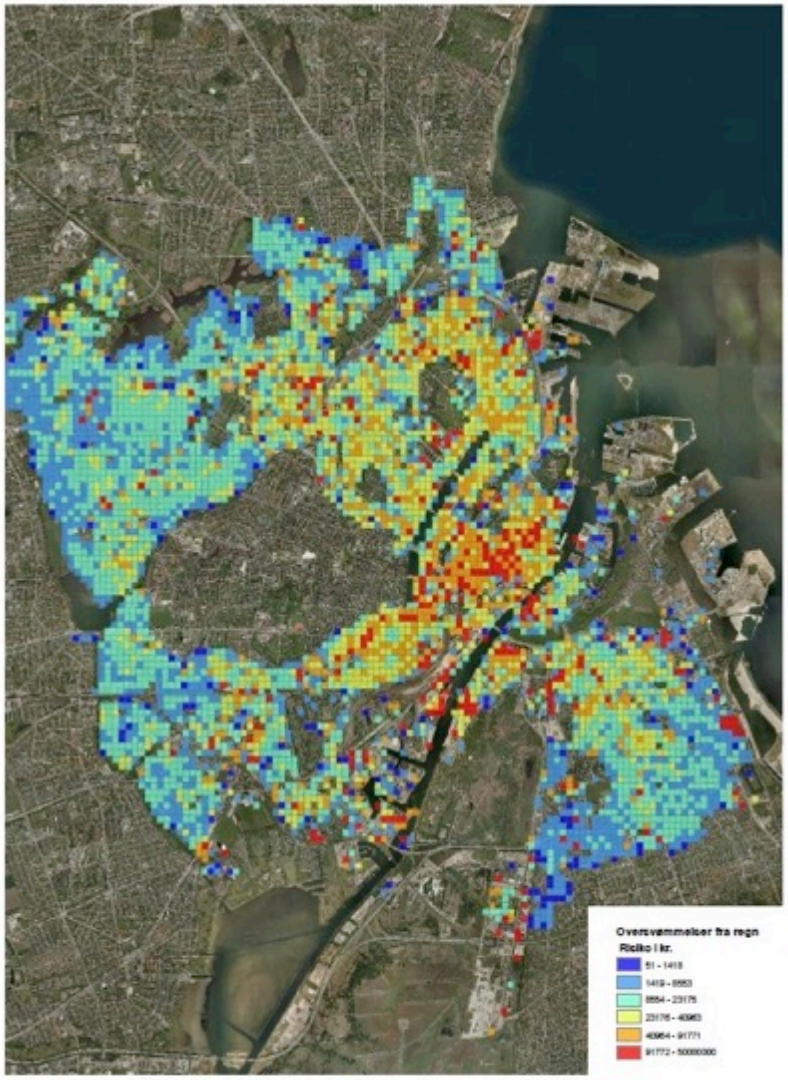
1000 more every month

We expect to be 20% more by 2025

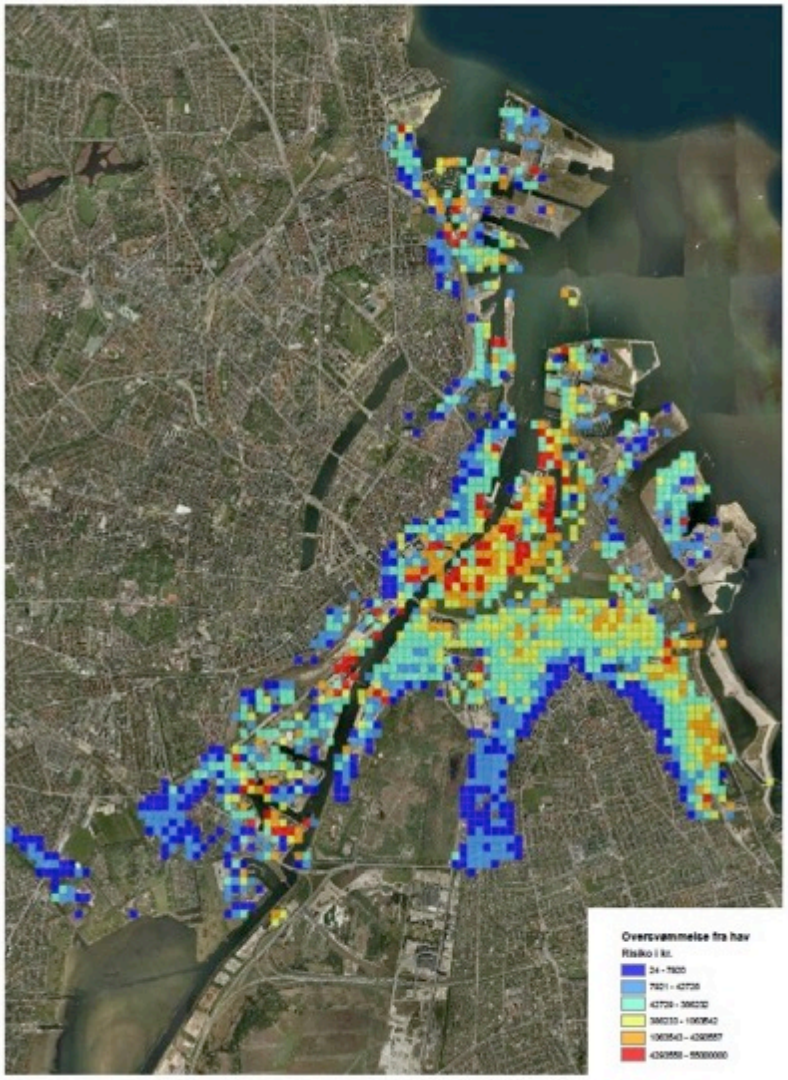
THE FUTURE WEATHER IN COPENHAGEN

- Warmer
- Wetter
- Wilder

THE CHALLENGES

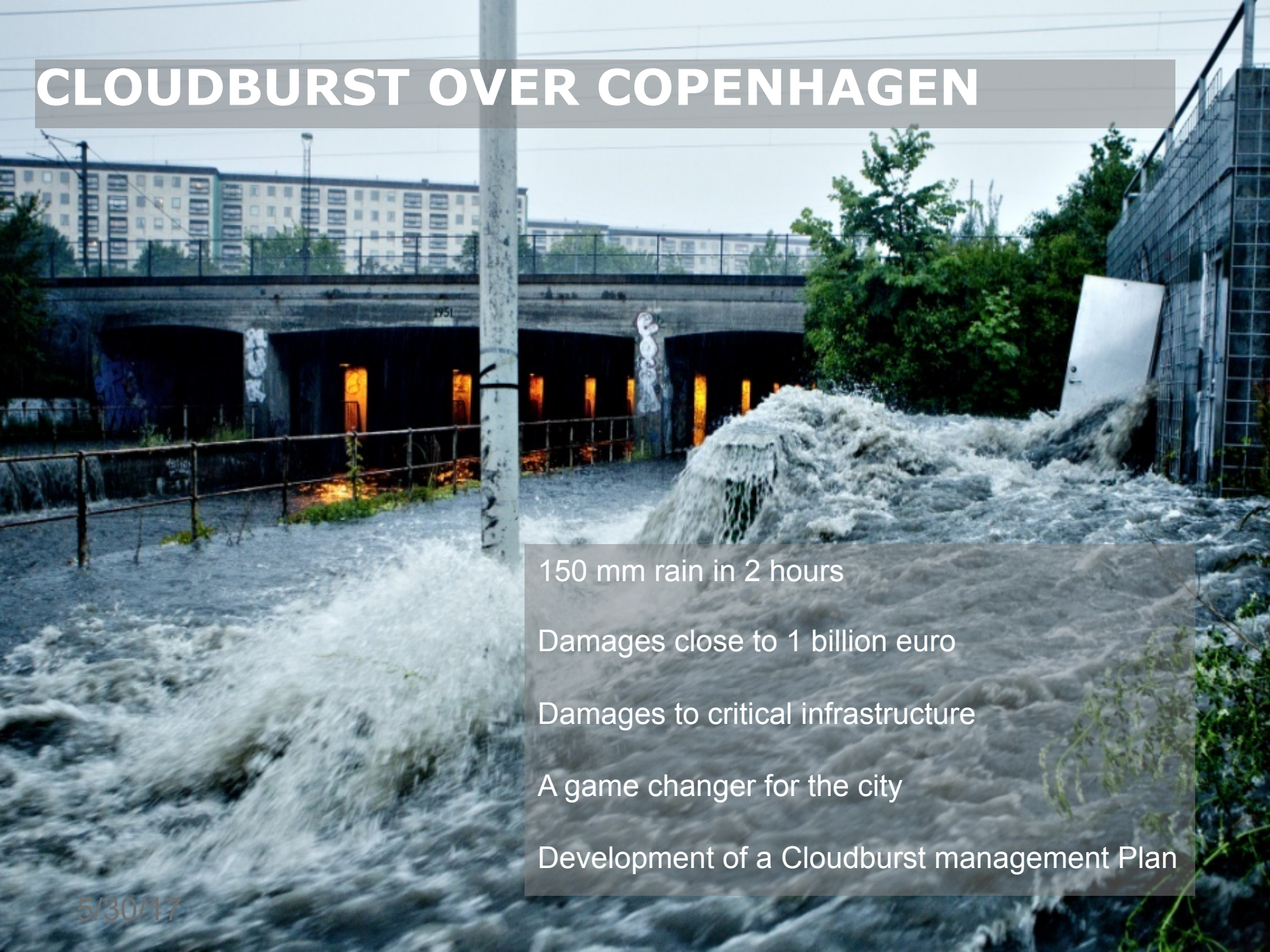


Risk map for flooding caused by rain in 2110



Risk map for storm surges from the sea in 2110

CLOUDBURST OVER COPENHAGEN



150 mm rain in 2 hours

Damages close to 1 billion euro

Damages to critical infrastructure

A game changer for the city

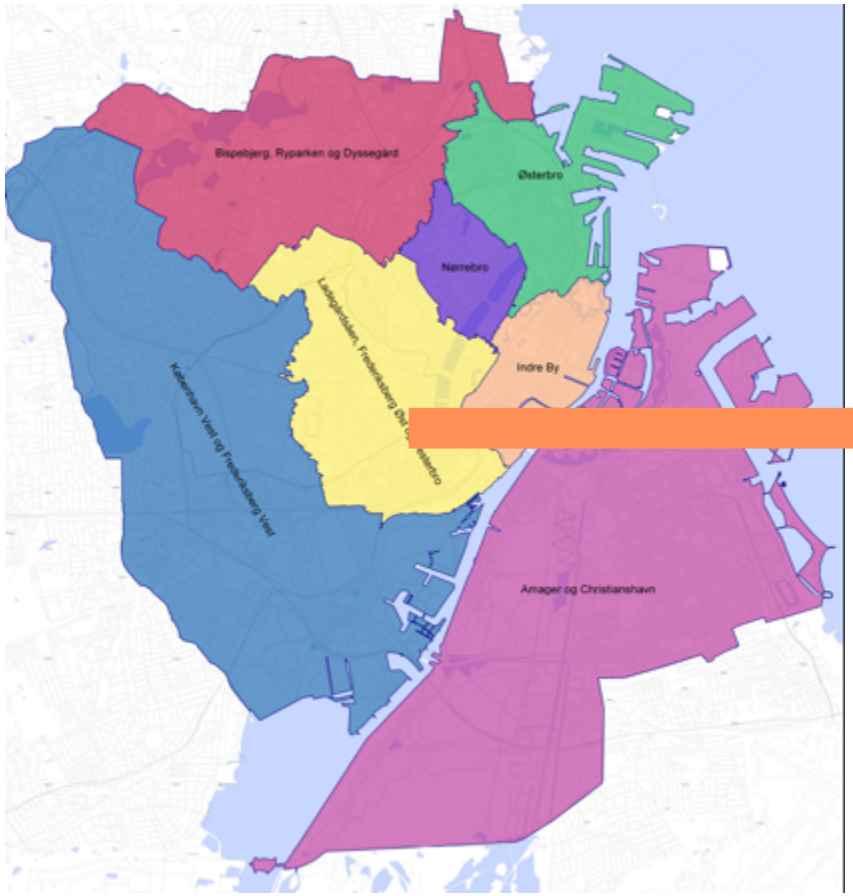
Development of a Cloudburst management Plan

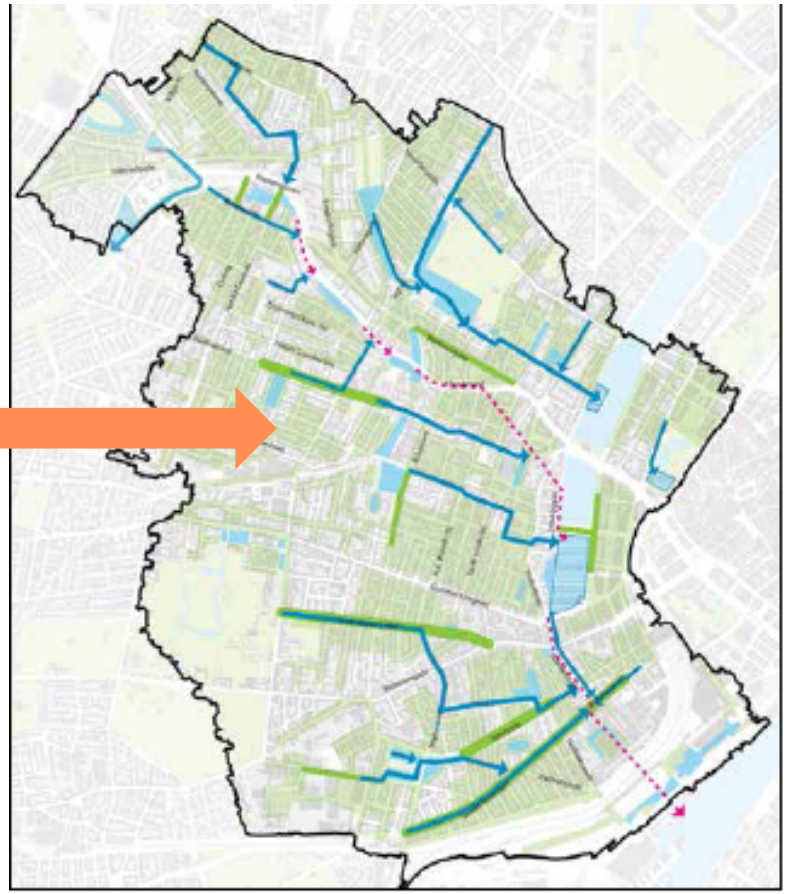
A STRONG VISION

- Multifunctional solutions
- Co-benefits
- Cost benefit analysis
- A liveable city

FOLLOWING THE NATURAL FLOW OF WATER

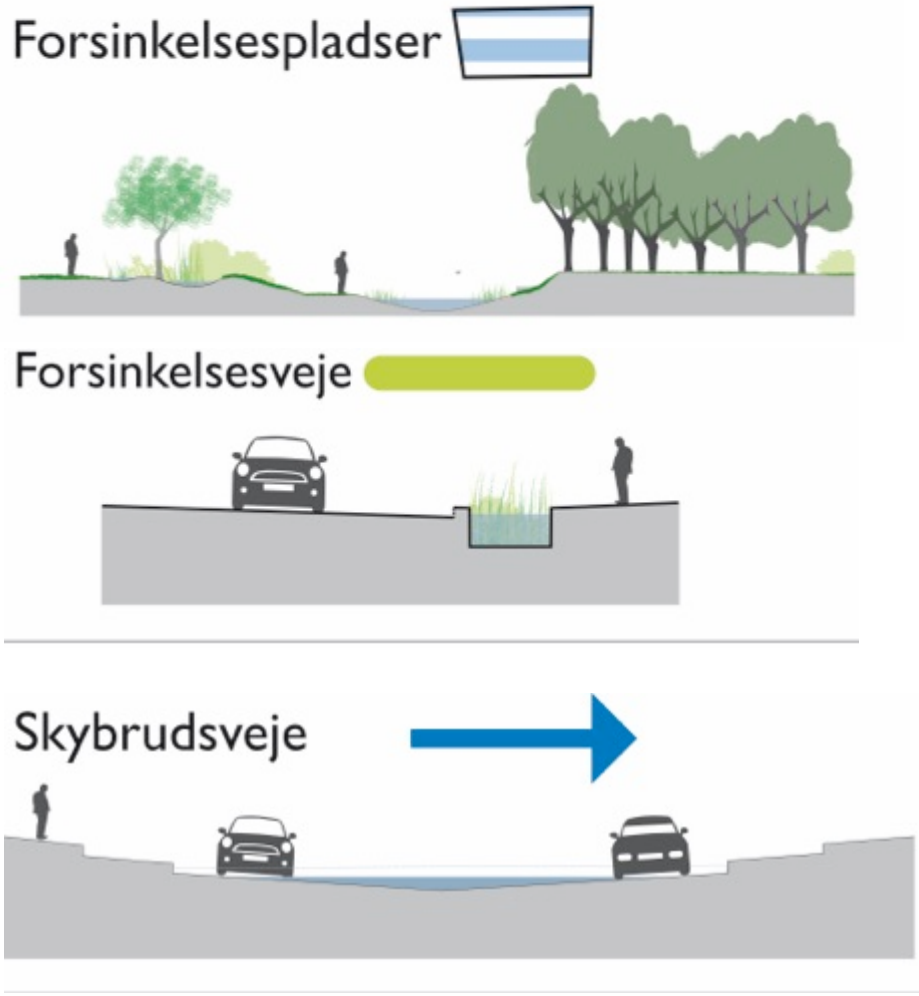
DIVIDING THE CITY INTO CATCHMENTS



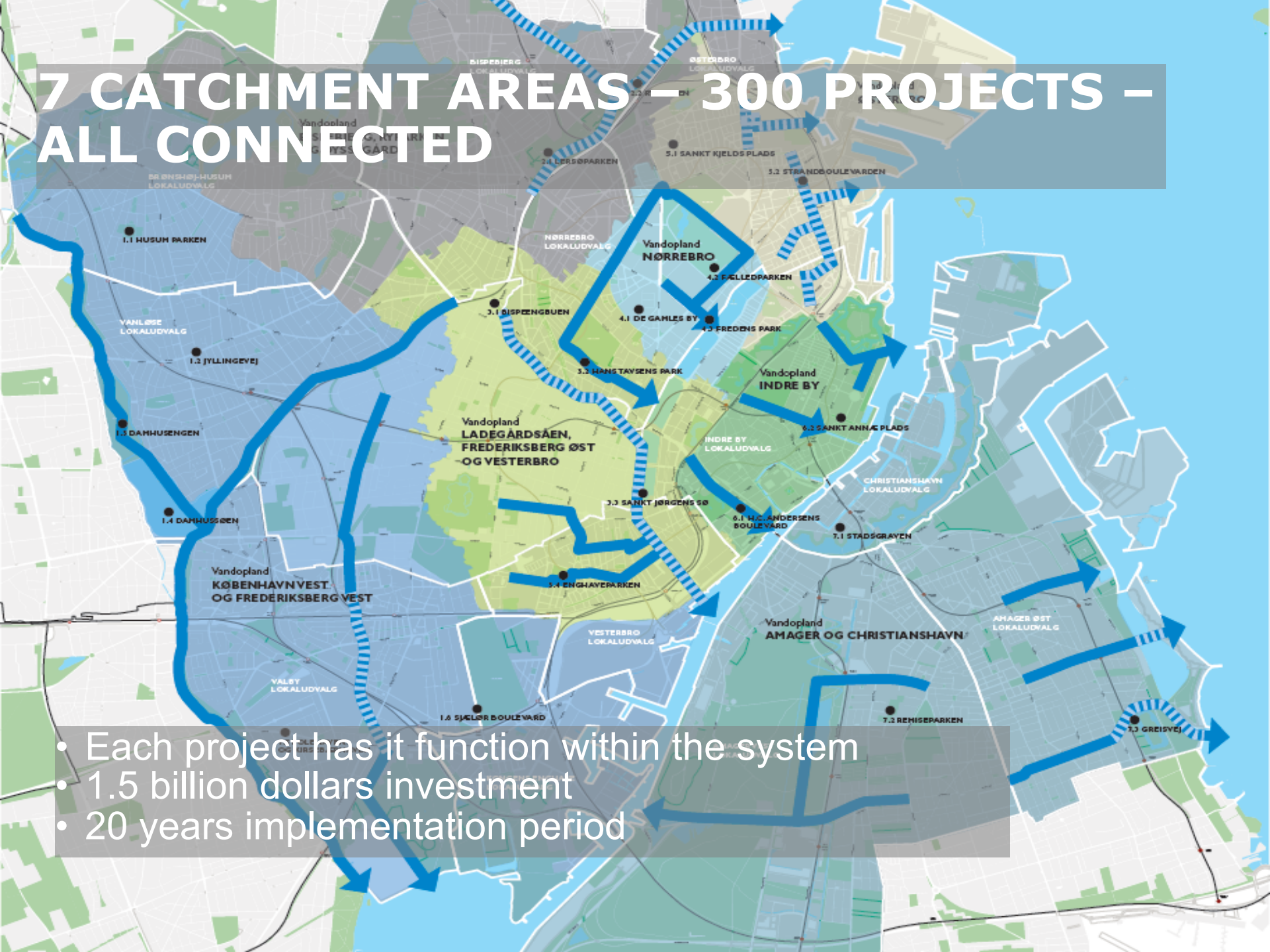


HOW DO WE MANAGE THE WATER?

- We store upstream – retention areas
- We delay downhill – retention streets
- We convey further down - cloudburst boulevards
- We discharge at the bottom (mostly tunnels)



7 CATCHMENT AREAS – 300 PROJECTS – ALL CONNECTED



- Each project has it function within the system
- 1.5 billion dollars investment
- 20 years implementation period

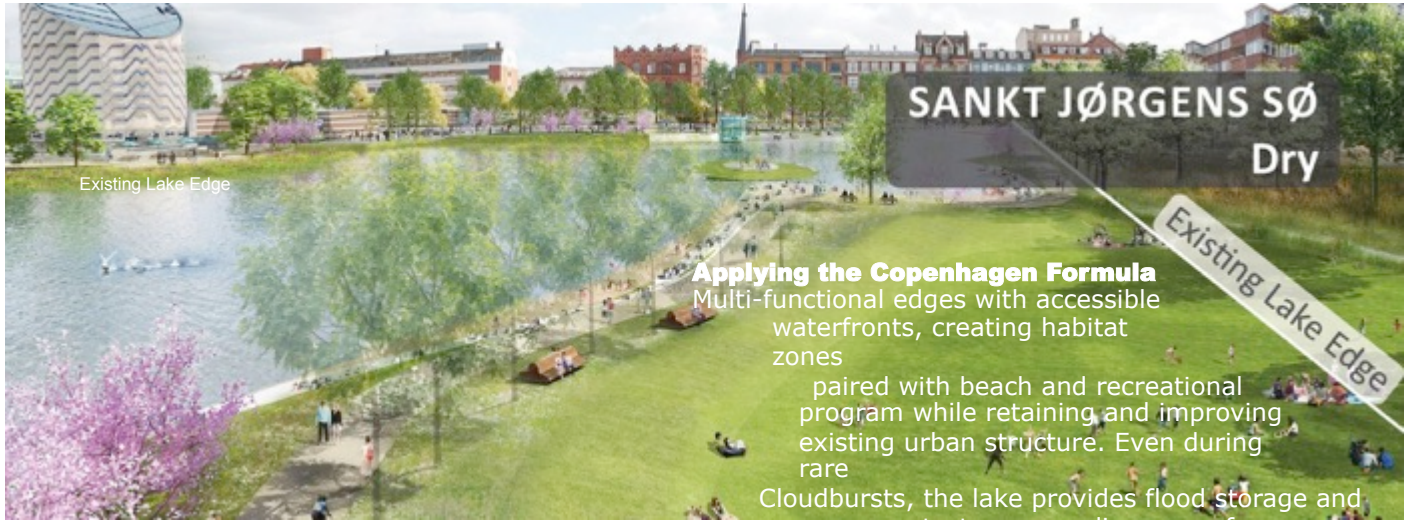
HYDRAULICS RULE!

- Hydraulic structure will be the backbone for all urban space developments for the next 20 years.
- It is through the cloudburst projects that other strategies for the city will be implemented – such as urban nature, bicycling etc.
- Annual project packets based on the hydraulic structure – with urban space improvements as parts of the projects

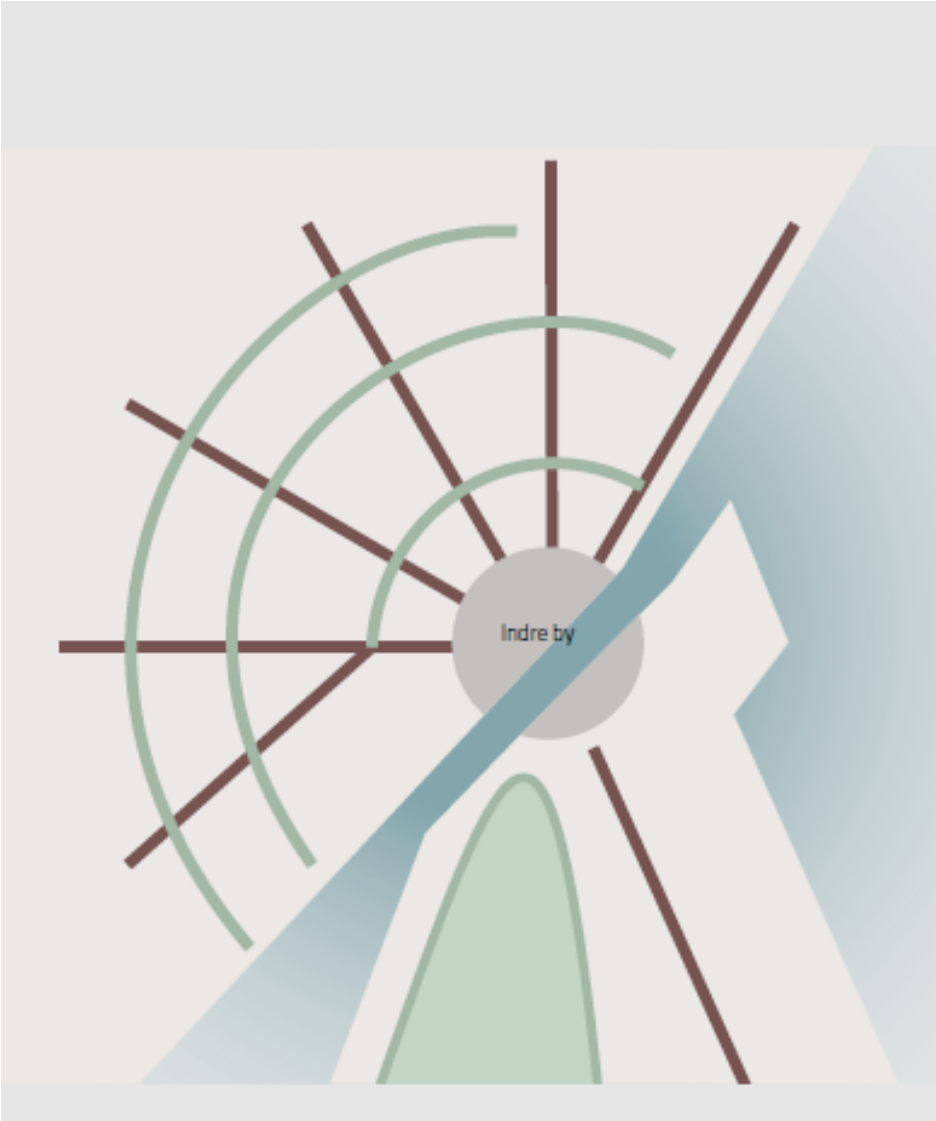
ADDED VALUE VISION

- Recreational value and biodiversity
- Meeting places
- Health
- Improved microclimate
- Synergy with traffic planning
- Accessibility and safety
- Educational
- Social factors – urban district renewal

MULTIFUNCTIONAL SOLUTIONS



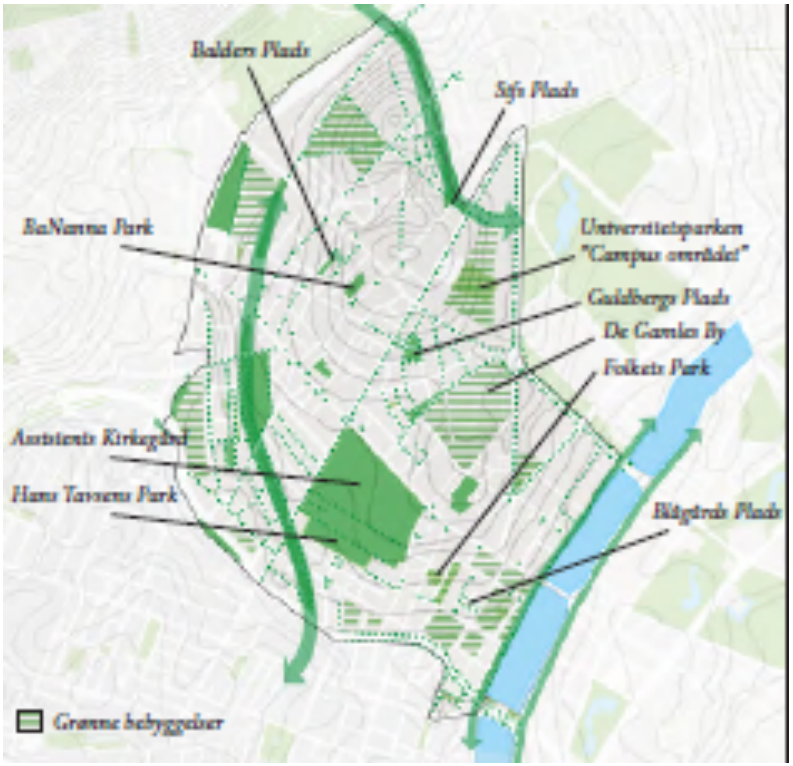
BUILDING ON THE UNIQUENESS OF COPENHAGEN NEIGHBOURHOODS



Focal points:

The city and the harbour
The homogenous city
The fortified city
Original entrances to the city
The green rings
The Green Common
Unique neighbourhoods

COMBINING URBAN SPACE AND CLOUDBURST PLAN

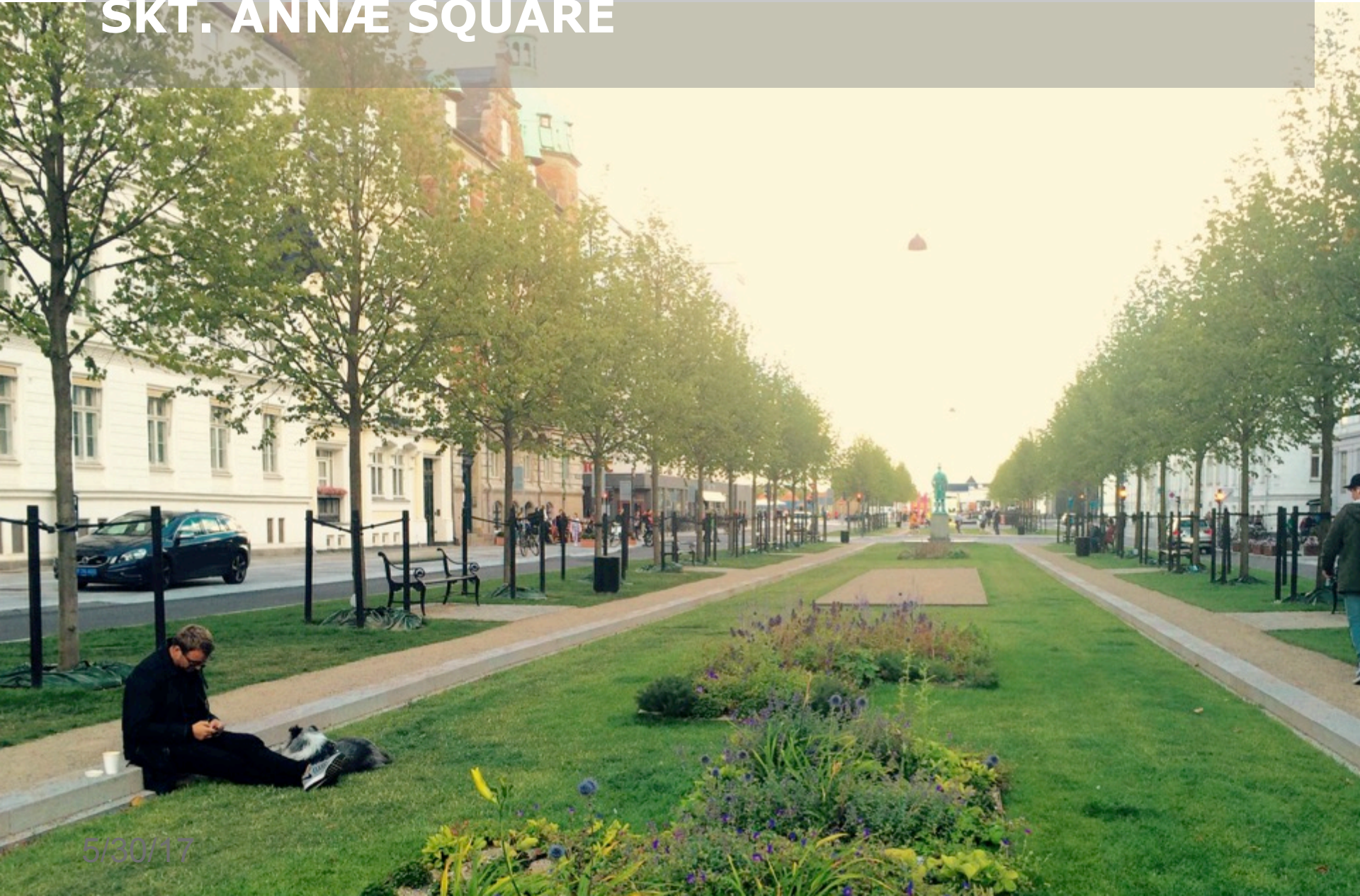


TÅSINGE SQUARE – THE FIRST WATER PARK

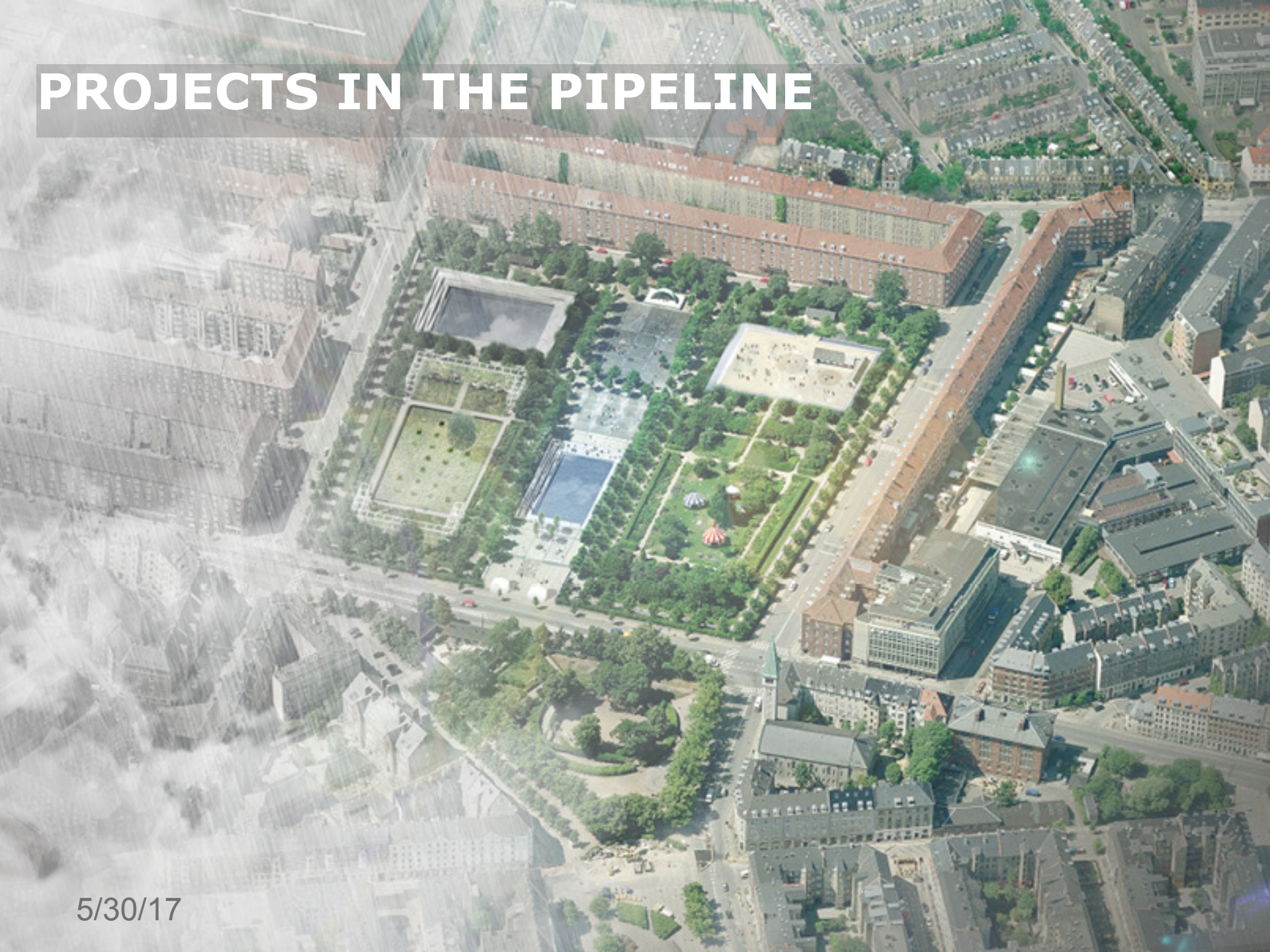
TÅSINGE SQUARE – THE FIRST WATER PARK

And it works….

SKT. ANNÆ SQUARE



PROJECTS IN THE PIPELINE



ENGHAVE PARK

BRYGGERVANGEN – A CLOUDBURST BOULEVARD

THE SOUL OF NØRREBRO

THE SOUL OF NØRREBRO

Korsgade - Lokalt byliv på solsiden. Mellem bænkene langs facaderne kan beboern
skabe grønne fortovshaver. Det byggede miljø komplementeres af det groede

CHALLENGES IN THE IMPLEMENTATION

- Constant organisational and political backup
- Economic – keeping prices low – and keeping adaptation from stopping economic development
- Different wishes to urban life – how do we fit in?
- We need to work within the existing infrastructure in the city
- Clash of professions

TIME LINE OF ADAPTATION PROCESS IN COPENHAGEN

August 2011

Plan approved by City Council

December 2012

Plan approved by City Council

2013-2014

Preparation af plan for each water catchment area

November, 2015

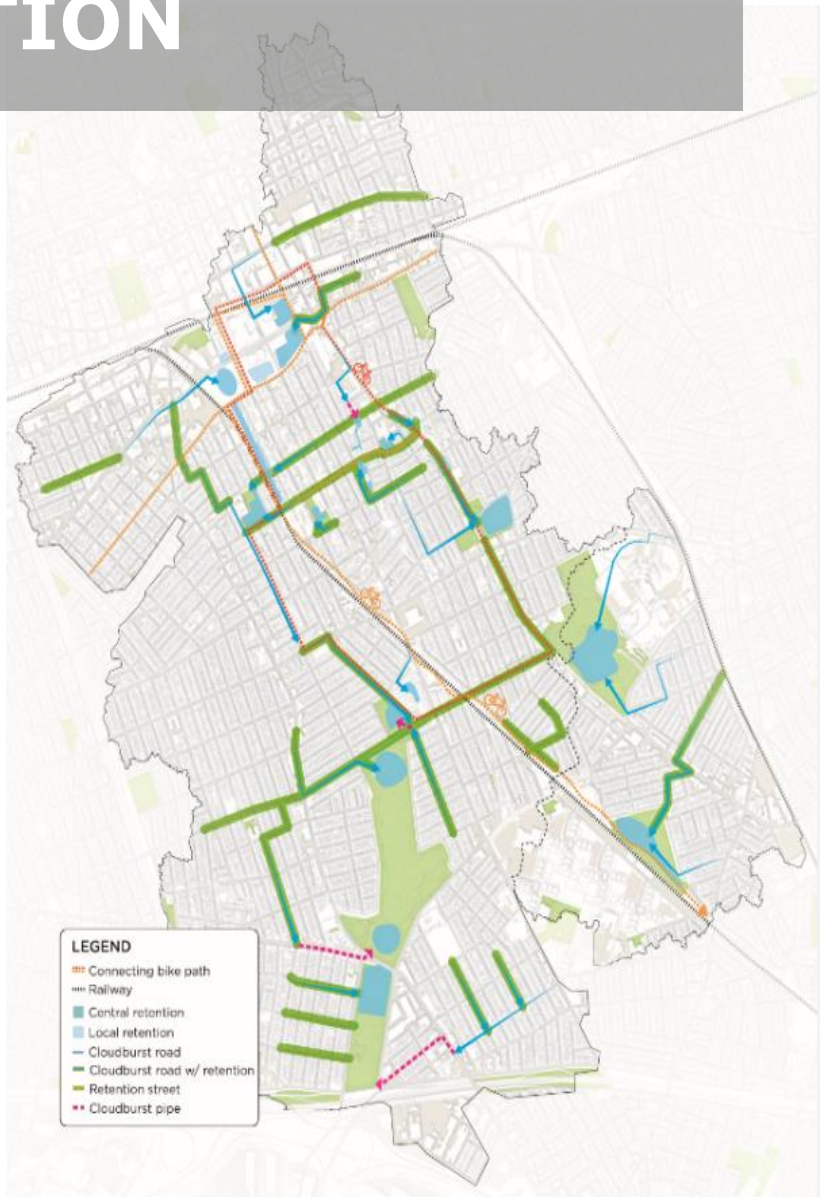
Political decision for implementation

NYC-CPH COLLABORATION

Focused on adaptation – and cloudburst management

Cloudburst management is new in a New York context

Based on the experiences from Copenhagen we are developing a small prototype cloudburst plan for an area in Southeast Queens




Thank you for your attention
Lykke Leonardsen
lykleo@tmf.kk.dk

9:00 - 10:15 AM

Panel 1: Physical Resilience – Managing Risk

Great Water Cities are more resilient because they manage risk. Planning for physical resilience encompasses investments in the management of risk to existing assets as well as envisioning their future investment needs. Infrastructure maintenance and upgrades require great resources, partnerships, and expertise – Great Water Cities invest in innovation, research, and entrepreneurship as tools for managing risk. Panelists will discuss how they have managed the risks to their physical assets and how they see and plan on addressing future risks.

Moderator:

Robin A. Barnes, Executive Vice President & COO, Greater New Orleans, Inc.

Panelists:

Anthony Maracic, P.E., Bureau of Wastewater Treatment, Director Asset Management and Capital Projects, NYC DEP

Traci J. Minamide, P.E., B.C.E.E., Chief Operating Officer, City of Los Angles, LA Sanitation

Alex Kaplan, Senior Vice President, Global Partnerships, Senior Client Manager, Swiss Re

Lynette Cardoch, Ph.D., Director, Coastal Resiliency, HDR

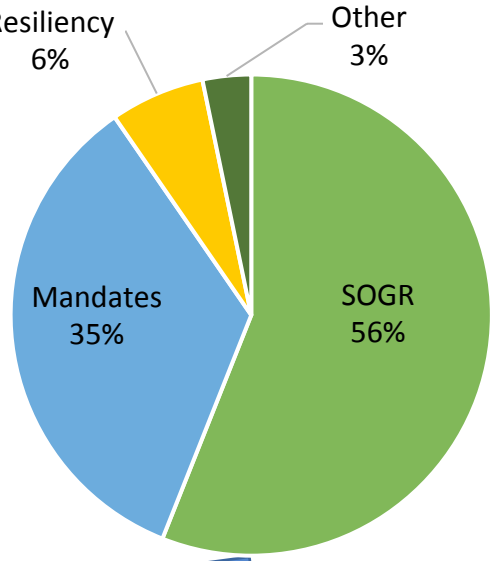
Bureau of Wastewater Treatment

Anthony Maracic, P.E., Director
Asset Management and Capital Projects

- Treat 1.3 billion gallons of wastewater daily
- Bureau infrastructure
  - 14 wastewater treatment plants
  - 96 Pumping Stations
  - 4 CSO storage facilities
  - 130 miles of interceptor sewers

Bureau of Wastewater Treatment

Environmental Protection



SOGR	3,588,887
Mandates	2,201,535
Resiliency	407,082
Other	208,843
	6,406,683

City of Los Angeles

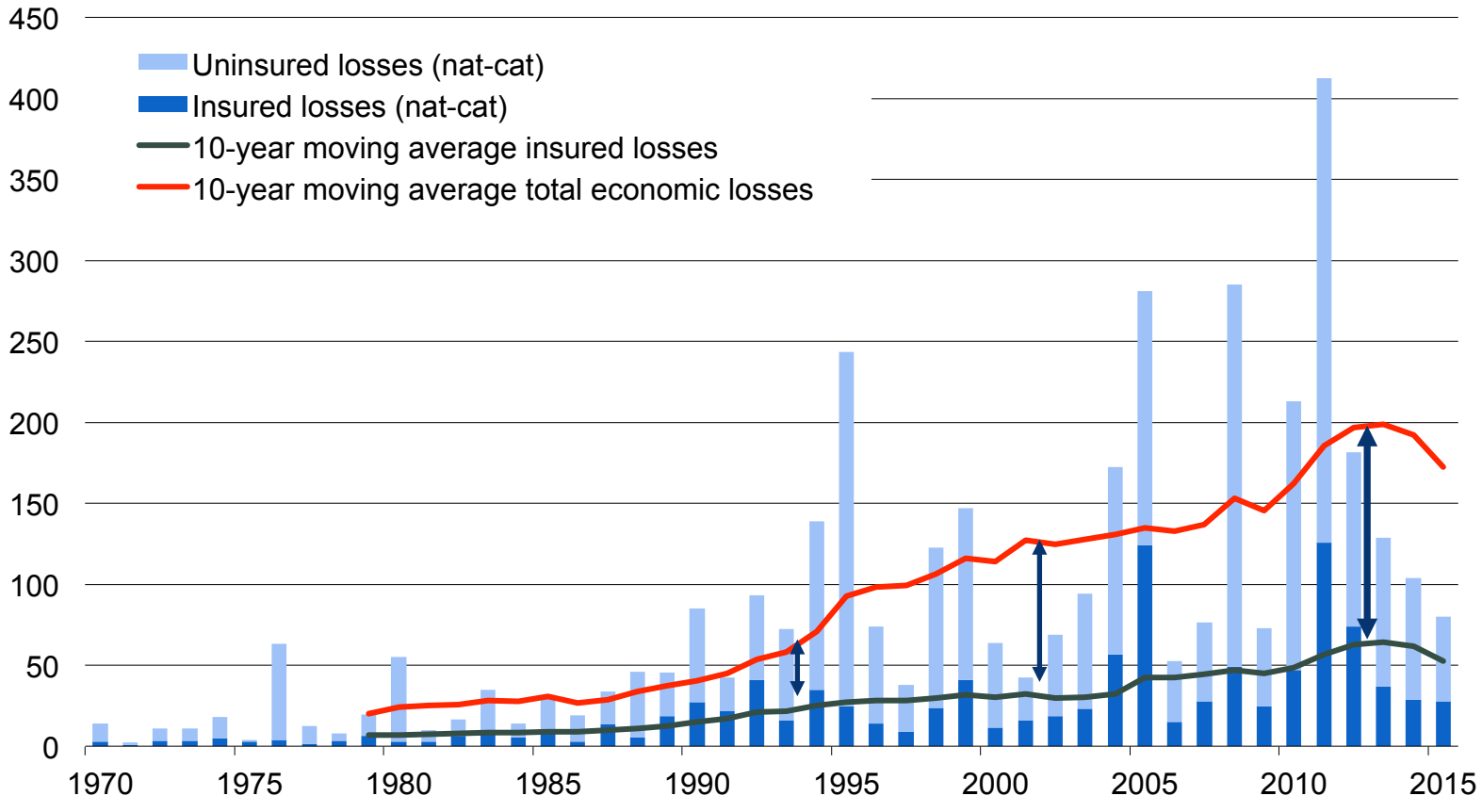
Traci Minamide
Chief Operating Officer
LASanitation

City of Los Angeles

- Population Served – 4 Million
- 600 sq mile service area
- 29 contract agencies
- 4 Water Reclamation Plants – 580 mgd capacity
- 6,700 miles of sewer and 47 ww pumping plants
- Wastewater CIP Budget - $300M/yr
- 1,200 miles of storm drains

Uninsured losses from natural catastrophes are a growing burden

Natural catastrophe losses 1970 – 2016 (in 2016 USD billion)



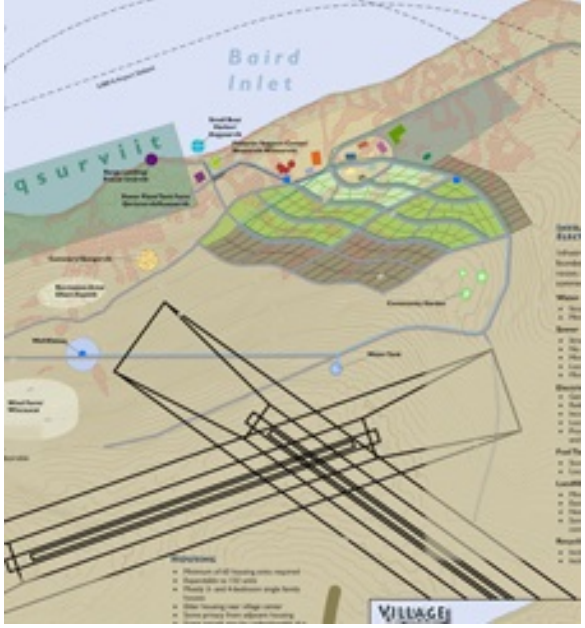
Source: Swiss Re Economic Research & Consulting and Cat Perils.

Climate change is not the main driver for rising natural catastrophe losses in recent decades

Ocean Drive, FL, 1926

Ocean Drive, FL, 2016

Source: WallpaperCave



Lynette Cardoch, Coastal Resiliency Director, HDR

Great Water Cities Summit 2017 Invest4Resilience

Interdisciplinary approach takes projects from vision to reality

Great Water Cities Summit 2017 Invest4Resilience

10:15 – 10:30 AM | BREAK

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10:30 - 11:45 AM

Panel 2: Financial Resilience – From Wall Street to Main Streets

Great Water Cities invest in financial resilience because it is the basis of a sustainable future. Wall Street and Main Street, partnering together, increase resilience and strengthens investments that support growing communities. In the United States and around the world, communities' leaders, investors and stakeholders have combined forces to build resilient financial mechanisms and products that innovate and grow, making the future brighter and more secure. Speakers in this panel will explore how solid financial planning and investment together with innovative thinking can help Great Water Cities achieve their financial goals.

Moderator:

Sabrina M. Ty, President & CEO, New York State Environmental Facilities Corporation

Panelists:

Dean Fuleihan, Director, Office of Management and Budget, Board Member, Municipal Water Finance Authority, New York City

Tim Williams, Managing Director, Public Power & Utilities, RBC Capital Markets

Neil J. Flanagan, Managing Director, Public Finance, Jefferies, LLC

Thomas Liu, Managing Director, Water and Wastewater/SRF Group, Bank of America Merrill Lynch

11:45 AM – NOON | BREAK

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12:00 – 12:30 PM | LUNCH

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12:30 - 1:00 PM | KEYNOTE ADDRESS

Daniel A. Zarrilli, P.E., Senior Director, Climate Policy and Programs, and Chief Resilience Officer, NYC Office of the Mayor

Daniel Zarrilli was appointed Senior Director of Climate Policy and Programs for the City of New York in January 2016 and is serving as New York City's Chief Resilience Officer, overseeing the Mayor's Office of Recovery and Resiliency, the Mayor's Office of Sustainability, the Mayor's Office of Environmental Coordination, and the City's OneNYC inclusive climate action program.

Prior to this, he was named the first Director of a new NYC Mayor's Office of Recovery and Resiliency in March 2014, and had served as the Acting Director of the NYC Mayor's Office of Long-Term Planning and Sustainability from February to December 2014. After Hurricane Sandy, he served on the Special Initiative for Rebuilding and Resiliency, a task force that developed an award-winning climate adaptation program for New York City.

Daniel was recently appointed by the NOAA Administrator to a 3-year term to the Sustained National Climate Assessment advisory board, is serving a 3-year term on FEMA's National Advisory Council, and is advising the State of Louisiana on its 2017 Coastal Master Plan update.

Previously, he was Senior Vice President for Asset Management at the New York City Economic Development Corporation and also spent five years with Bechtel Infrastructure Corporation. Daniel is a New York State Professional Engineer and holds an MS in Civil and Environmental Engineering from MIT and a BS in Civil Engineering from Lehigh University. He resides in Staten Island with his wife and three children.

1:00 – 1:15 PM | BREAK

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1:15 - 2:15 PM

Panel 3: Workforce Resilience – Building the Team of the Future

Great Water Cities invest in workforce resilience by building the team of the future. Communities are investing in identifying what the team of the future will look like – comfortable with technology and innovation, adaptive, cross-trained, and engaged in their community. Resilient communities are investing in institutional elements that strengthen their workforce and plans for the team of the future, making sure they will address their needs. This panel will bring together leaders who are investing in a team of the future and workforce who will reflect their increasingly resilient investments.

Moderator:

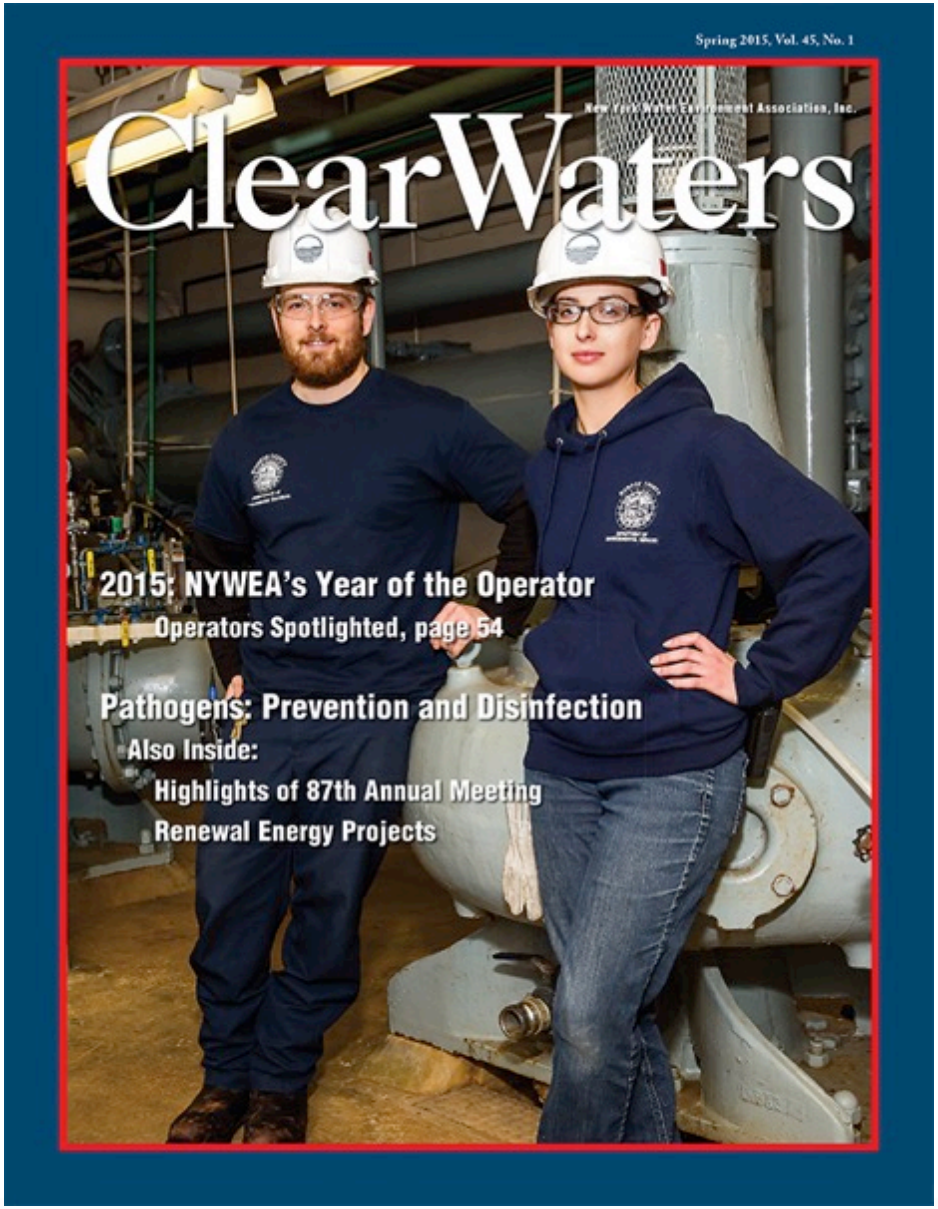
Michael J. Garland, P.E., Director of Environmental Services, Monroe County, NY

Panelists:

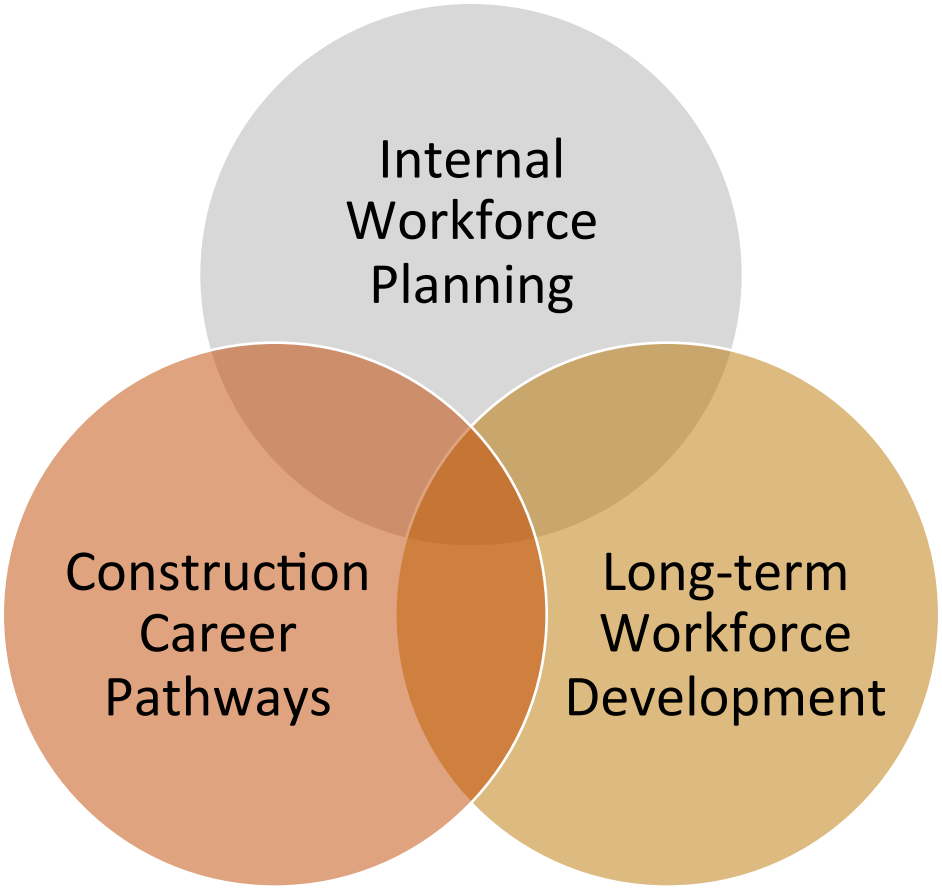
Rudolph S. Chow, Director, Department of Public Works, City of Baltimore, MD

Harlan L. Kelly, Jr., General Manager, San Francisco Public Utilities Commission

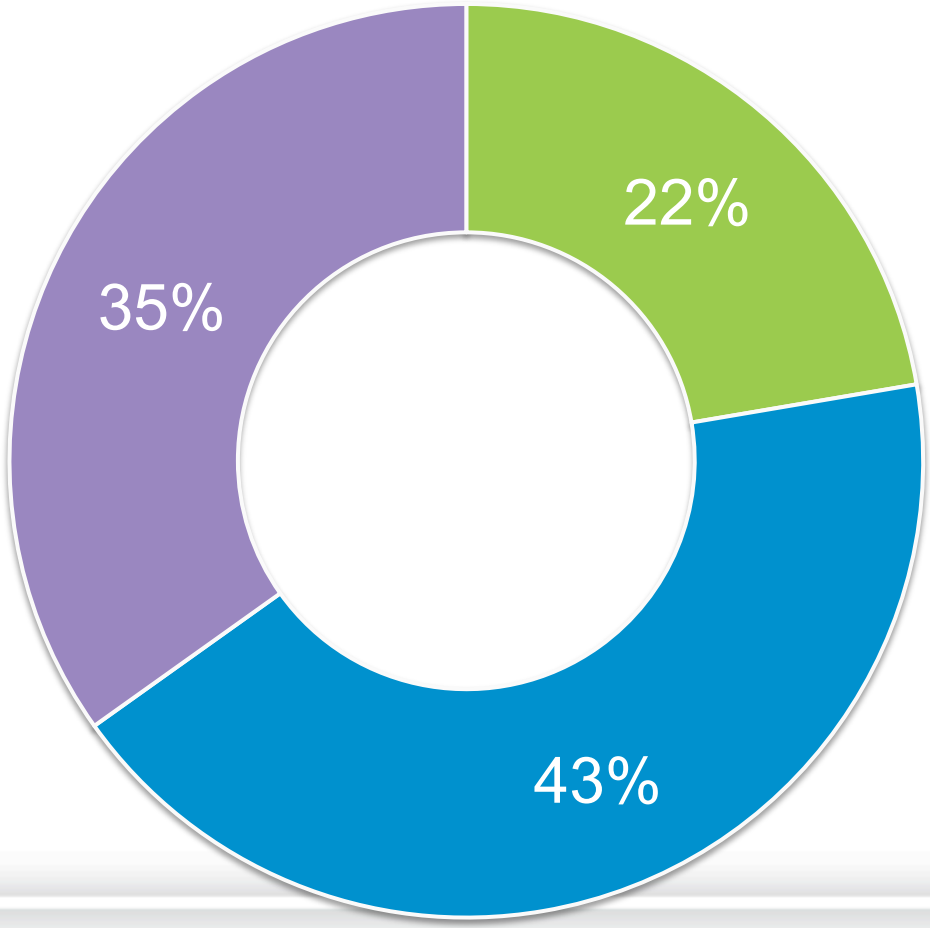
Diana Jones Ritter, Deputy Commissioner, Bureau of Organizational Development, NYC Department of Environmental Protection.



Workforce Needs



Voluntary Separation from SFPUC Position



N = 1205

About NYC's Department of Environmental Protection (DEP)

NYC DEP protects public health and the environment by supplying clean drinking water, collecting and treating wastewater, and reducing air, noise, and hazardous materials pollution.

- Largest combined municipal water and wastewater utility in US
- Nearly 6,000 employees
- 1.2 billion gallons of high quality drinking water per day to 8.5 million NYC residents and 1 million Upstate
- Collects and treats 1.3 billion gallons of wastewater per day
- 19 reservoirs, 3 controlled lakes
- 7,000 miles of water mains, tunnels and aqueducts
- 7,500 miles of sewers
- 14 wastewater treatment plants, 96 wastewater pumping stations, 6 dewatering facilities

Current State of DEP's Workforce

Advantages/Opportunities

- Knowledgeable and experienced employees
- Diversity of talent
- Attraction to challenging and innovative gray and green infrastructure projects
- Strong leadership
- Extraordinary pride in all levels of the workforce
- Growing interest in the 'Call to Public Service'

Challenges/Opportunities

- Changing technology
- Managing a multi-generational workforce
- Competing with private industry in recruitment and retention
- Growing attrition rate
- Sourcing talent via the Civil Service System
- Predicting and sourcing the competencies for future work priorities

2:15 - 3:00 PM

Case Study and Discussion: Insurance Defection --

Should communities facing flood risk stop paying insurance and start resilient transformation?

This Case Study session will examine quantifiable examples of how flood risk-prone communities can approach physical resiliency at a neighborhood scale, through an evaluation of the current NFIP insurance program and other financing mechanisms. The examples will illustrate and compare the present value of various recovery-based financing against debt service on different phases of resilient capital projects. This session will be interactive to allow for a dialogue with the presenters.

Presenter:

Peter Glus, P.E., B.C.E.E., City Executive for NYC and Director of North American Big Urban Clients, Arcadis.

ARCADIS Design & Consultancy for natural and built assets

INSURANCE DEFECTION

Peter Glus PE BCEE

May 2017

Great Water Cities Summit 2017 Invest4Resilience

ARCADIS Design & Consultancy for natural and built assets

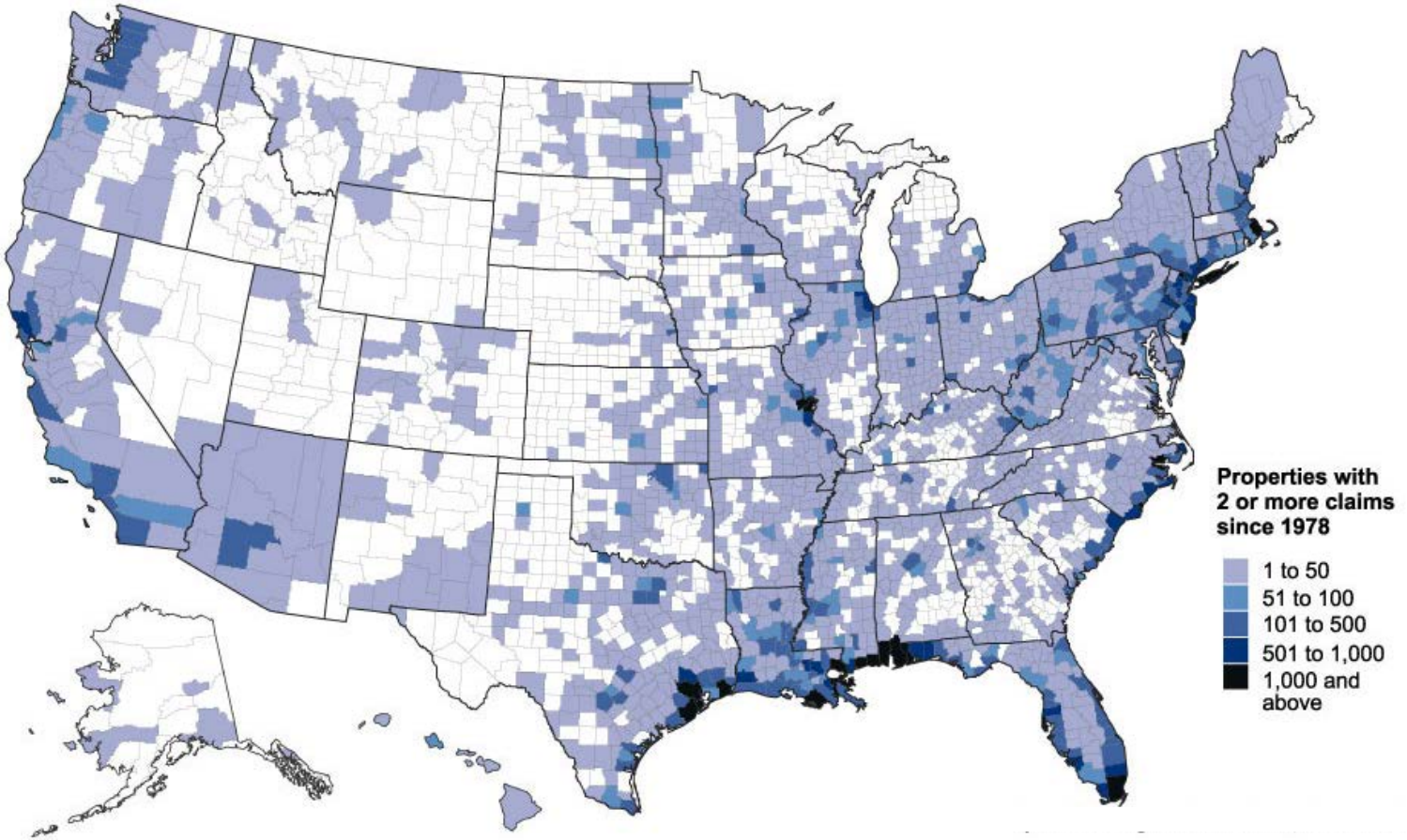
> “Insurers must make reasonable accommodations and take reasonable precautions for potential consequences of climate change. Should projected scenarios come to fruition, insurers not adequately prepared could face an **existential threat** to their business.”

– NAIC CIPR Study, April 2017

ARCADIS Design & Consultancy for natural and built assets

Flooding frequency in the US

Source: Paul Overberg



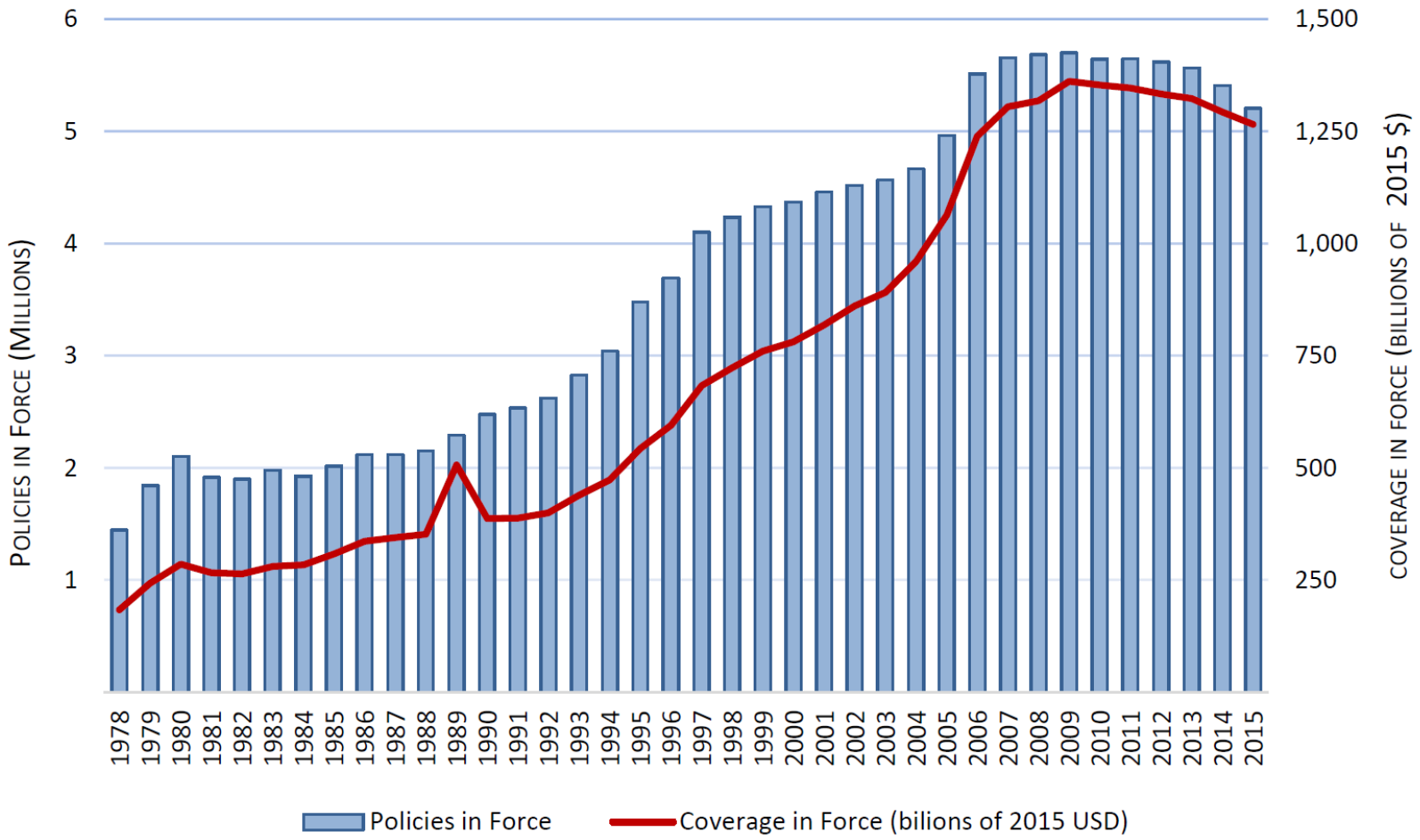
States at greatest risk

Source: CoreLogic

State	Properties at risk	Value at risk
Florida	1,470,000	$386 billion
Louisiana	411,000	$72 billion
Texas	370,000	$51 billion
New Jersey	350,000	$119 billion
Virginia	329,000	$78 billion
New York	270,000	$134 billion

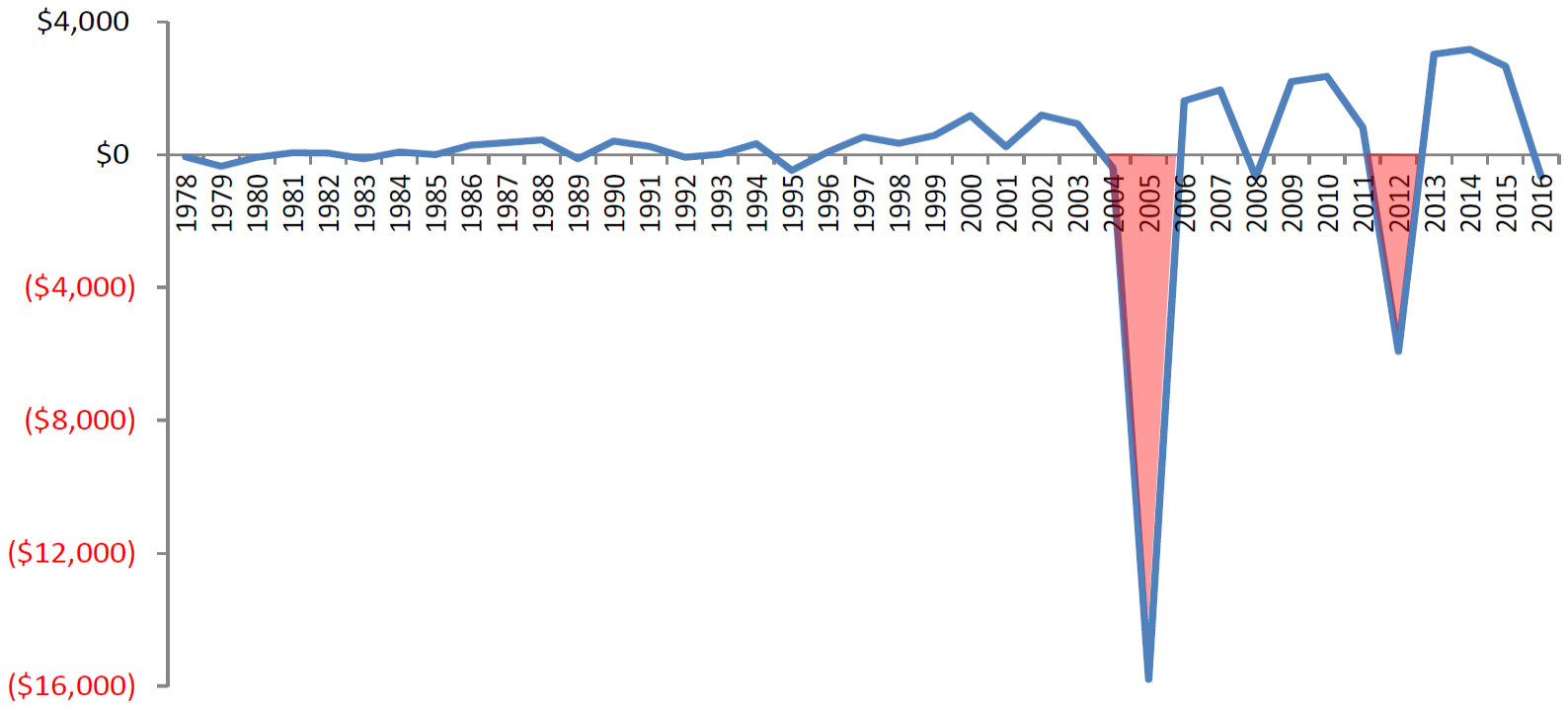
NFIP policies in force (1978-2015)

Source: FEMA



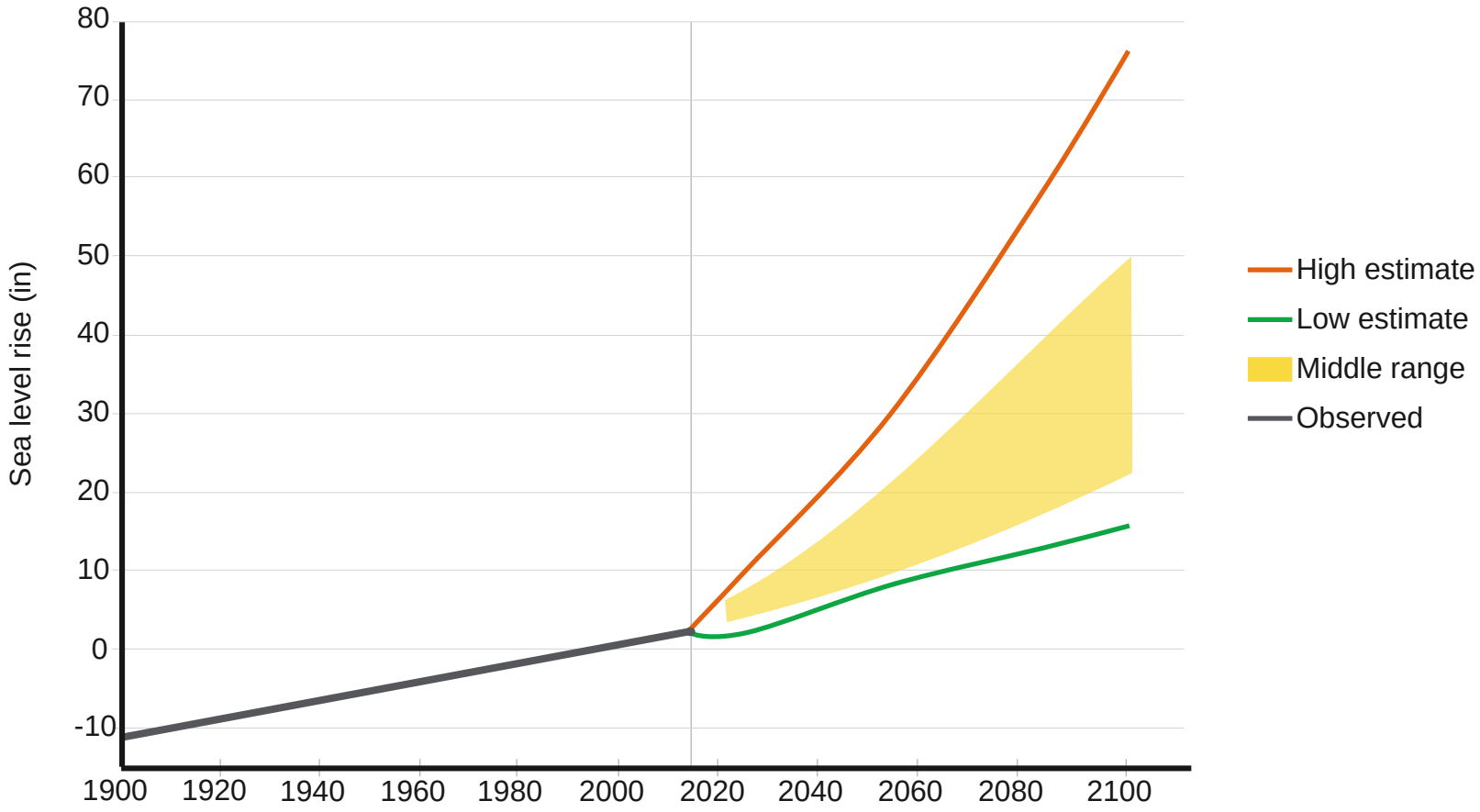
Difference between earned premium claims paid by NFIP by year
(1978-2015 in $ Millions)

Source: FEMA



Projected and actual sea level rise

Source: NYC NPCC2

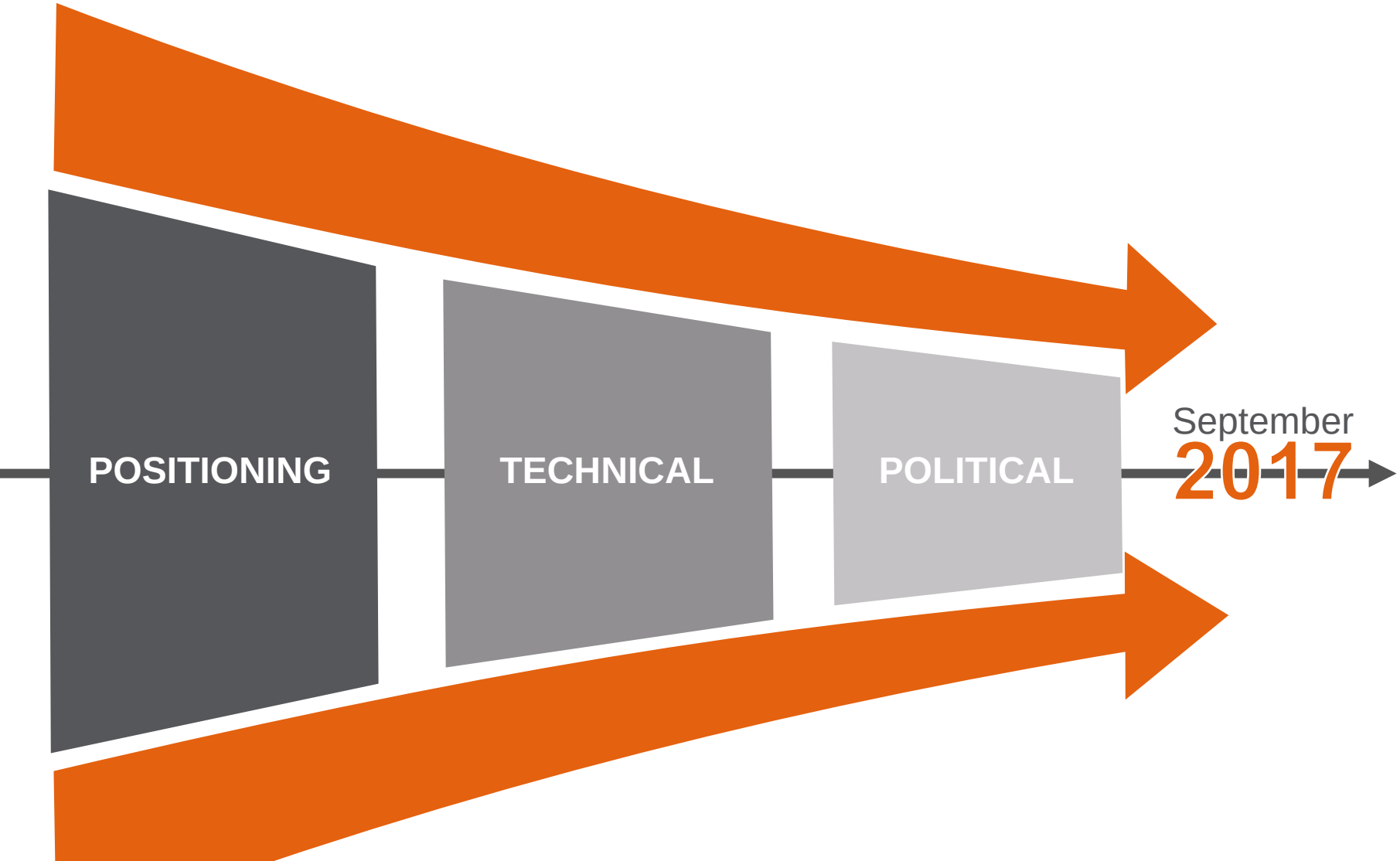


NFIP reauthorization September 2017

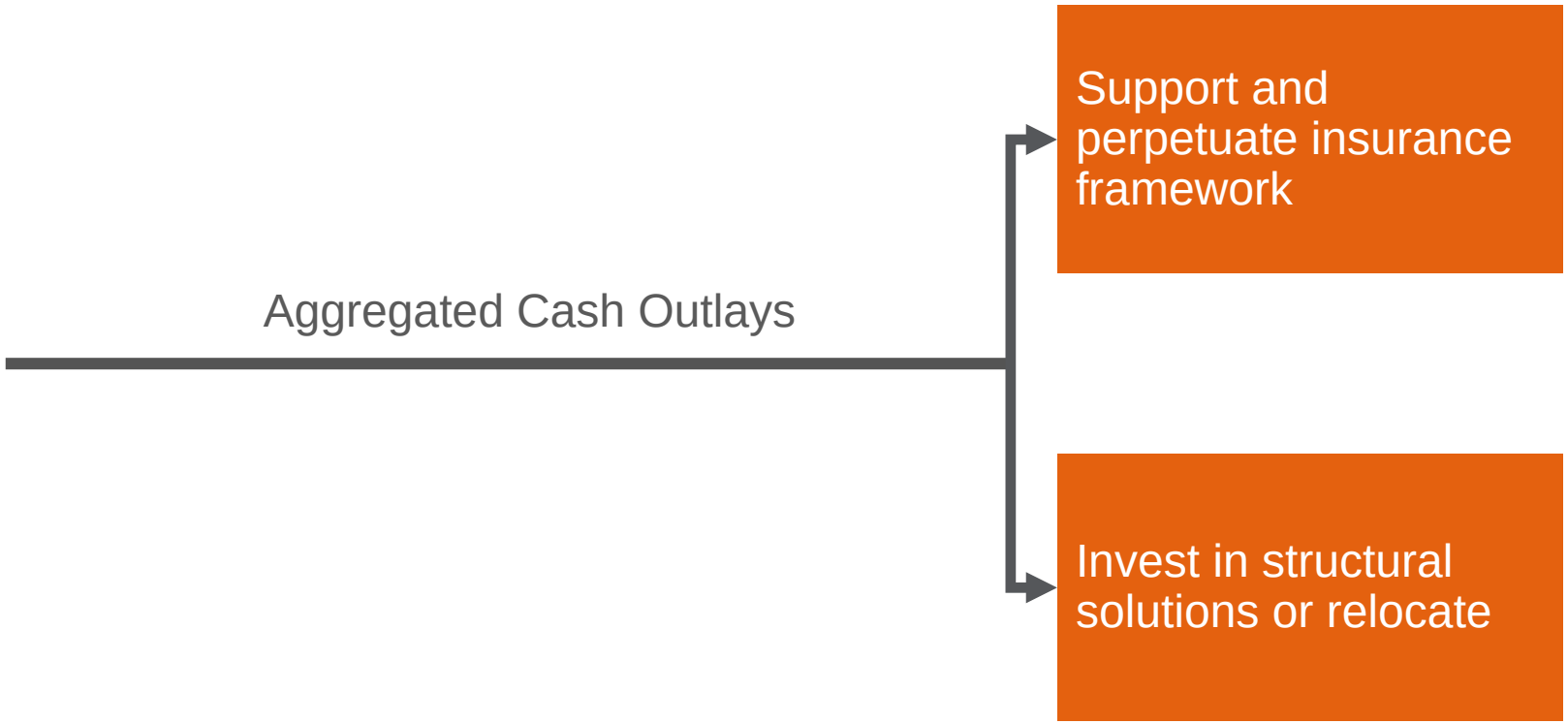
- To provide flood insurance protection to property owners, in return for floodplain management and damage mitigation
- Reauthorized every 5 years
- Reauthorization would seek to find a balance between keeping NFIP solvent without pricing people out of their houses
- Current discussion focuses on risk-based premiums, reinsurance, and the entrance of private insurers into the market
- NFIP's low rates make it difficult for private insurers to compete, and the fact that private insurers can't compete makes it hard for NFIP to raise its rates

ARCADIS Design & Consultancy for natural and built assets

NFIP reauthorization dialog



…from a community perspective



…800-home coastal community

Comparison of choices at the community level:

1. Purchasing flood insurance
2. Jacking houses above the BFE
3. Ringing the community with a certified levee
4. Elevating the land underneath the community
5. Reconstructing an elevated, resilient community
6. Relocating the community

…800-home coastal community

Comparison of choices at the community level:

1. Purchasing flood insurance
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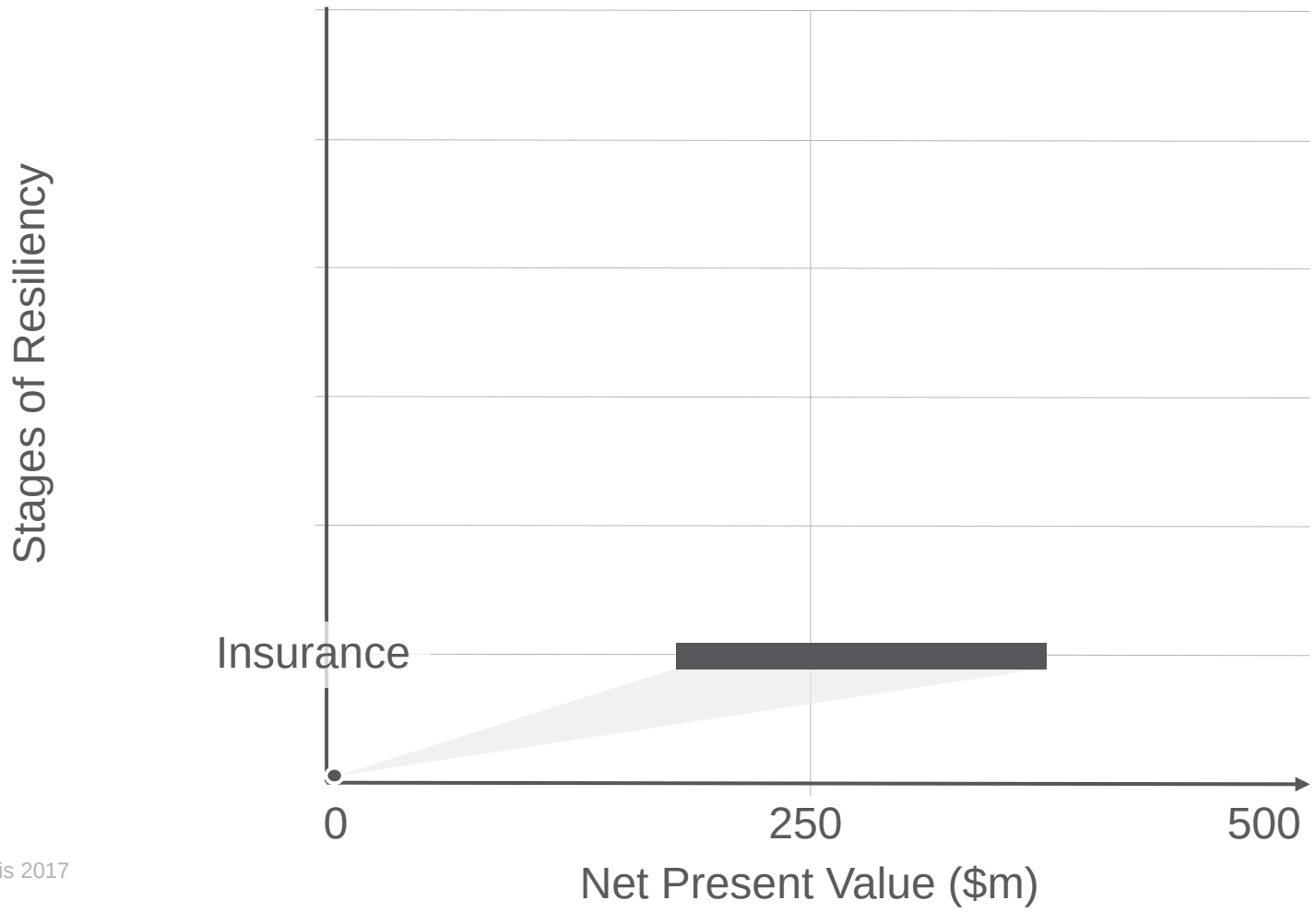
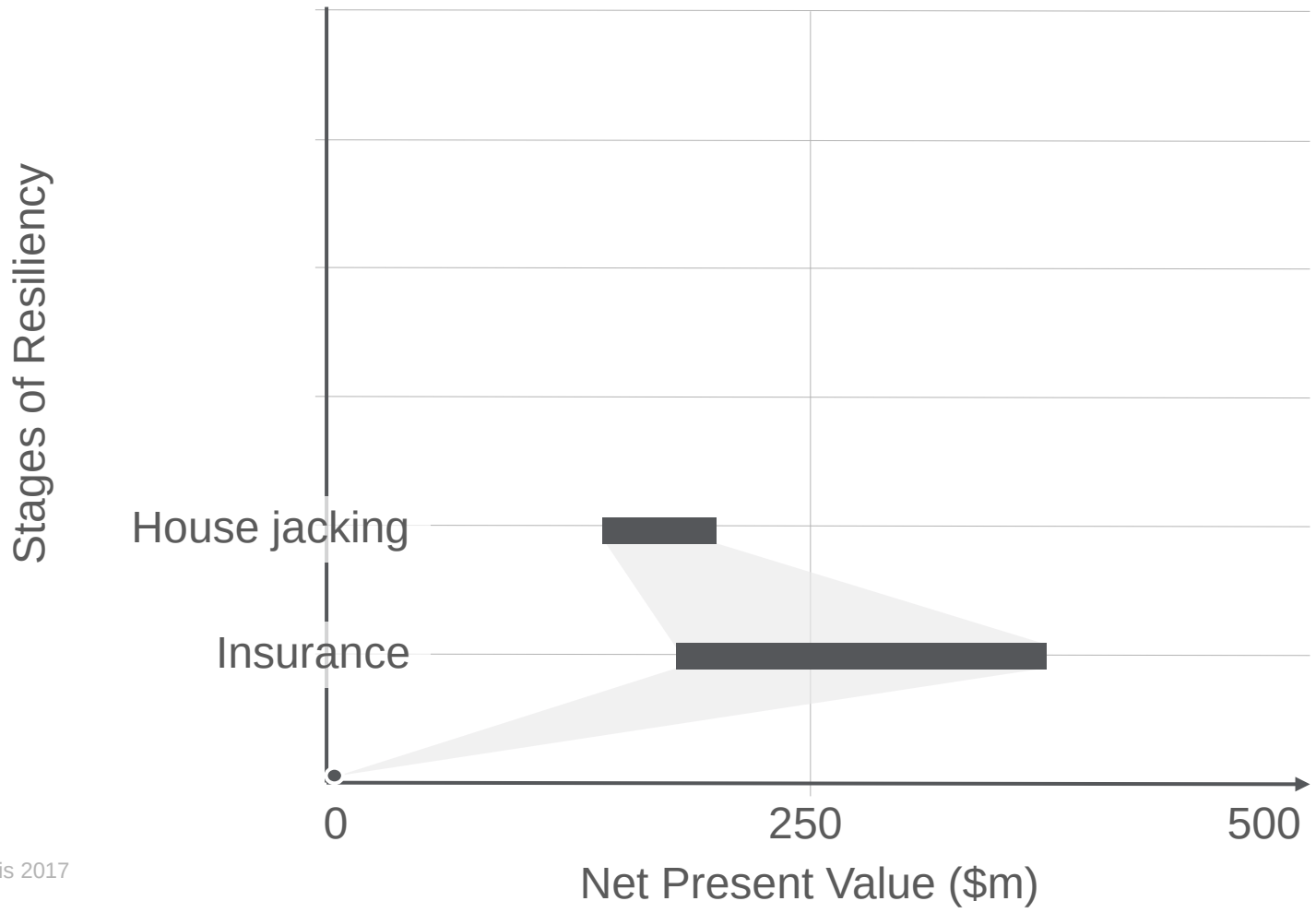
3. Ringing the community with a certified levee
4. Elevating the land underneath the community
5. Reconstructing an elevated, resilient community
6. Relocating the community

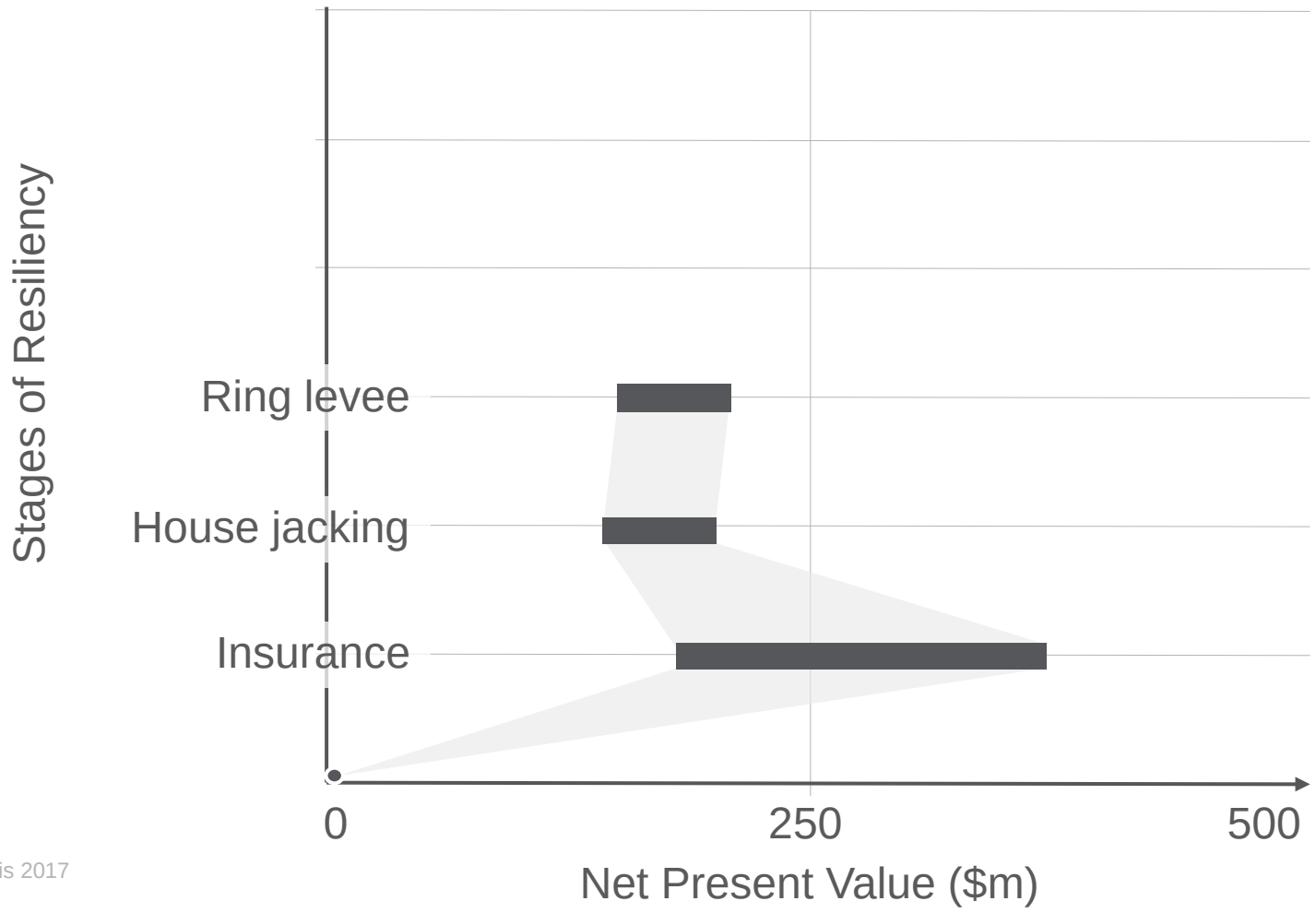
1. Flood insurance



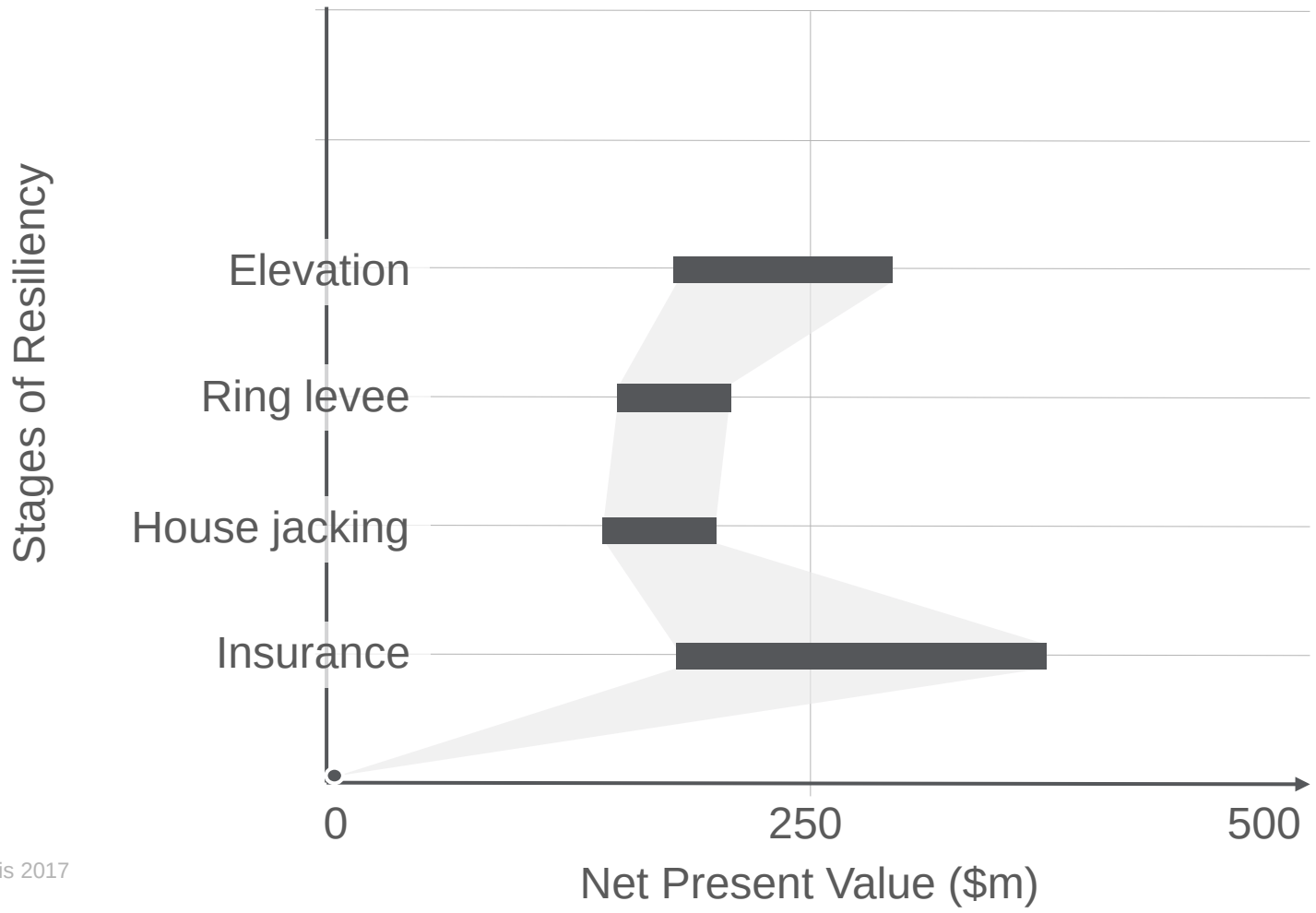
2. Jacking



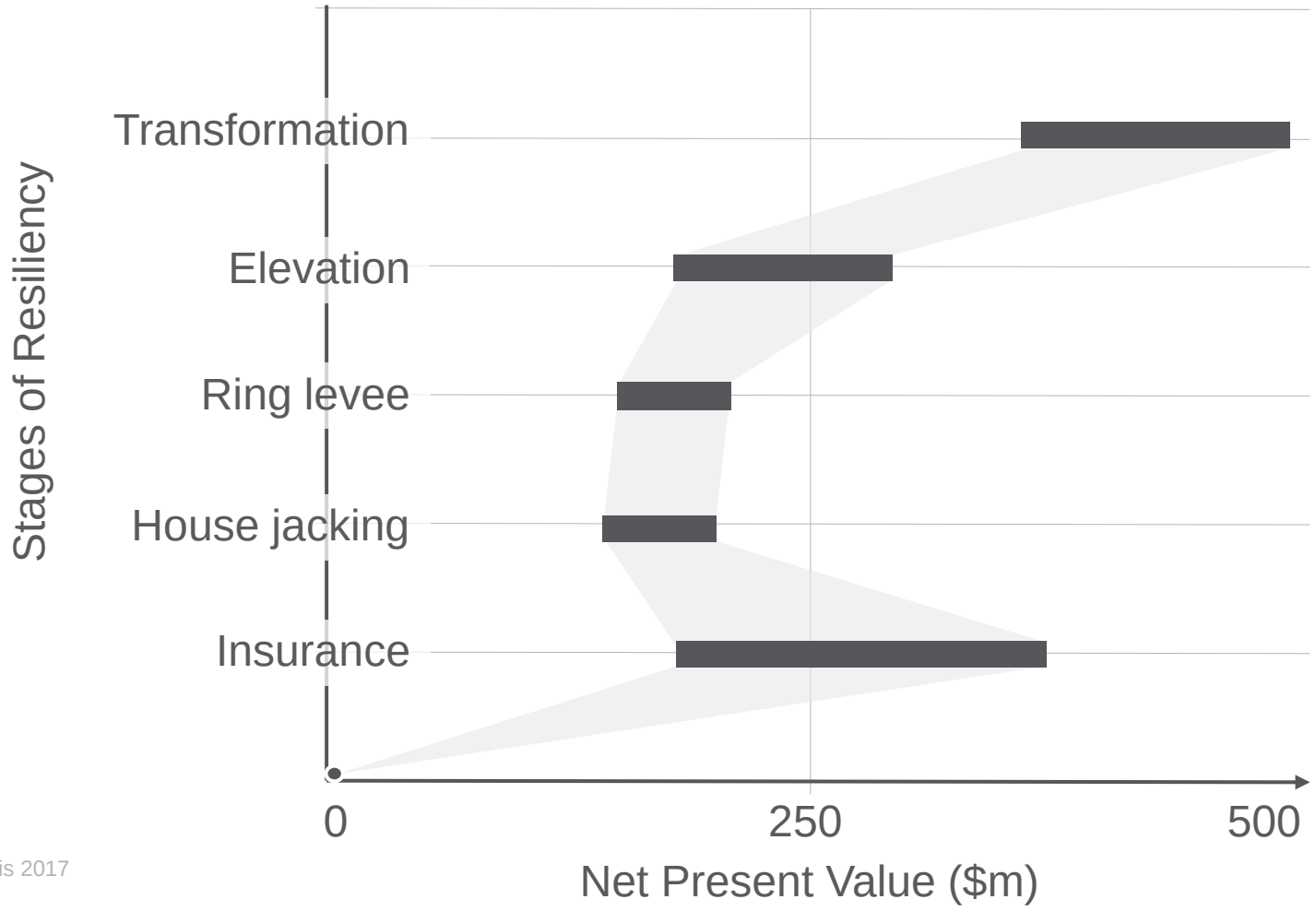
3. Ring levee



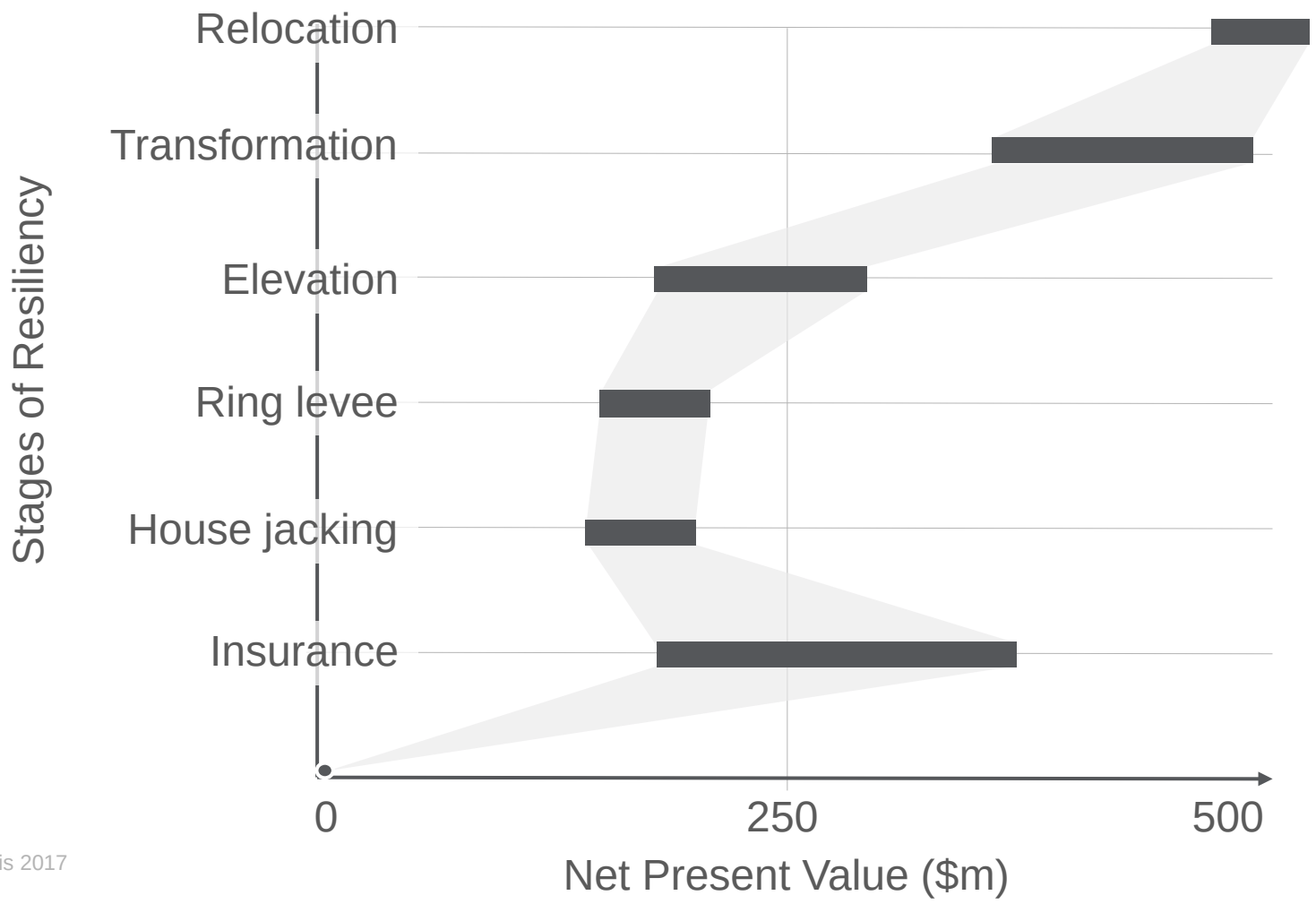
4. Community elevation



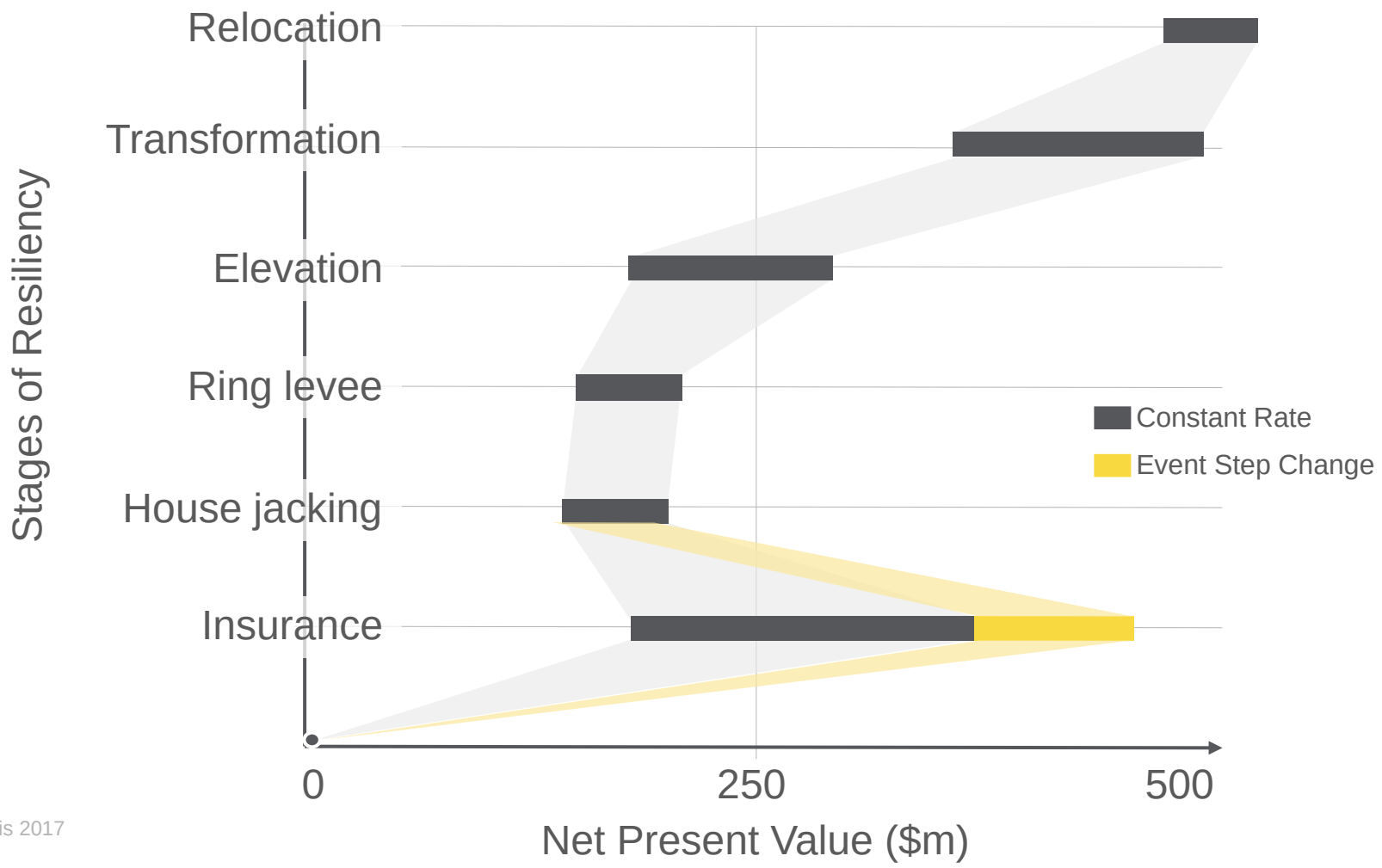
5. Resilient transformation



6. Community relocation



Time skews disproportionately



Returning to the choice…

- Community Insurance
- Private Insurance / Insurance Linked Securities
- Catastrophic Bonds and Reinsurance

OR

- SRFs / Grants and Loans
- RIDs / Resiliency Improvement Districts
- Private Investment Pools

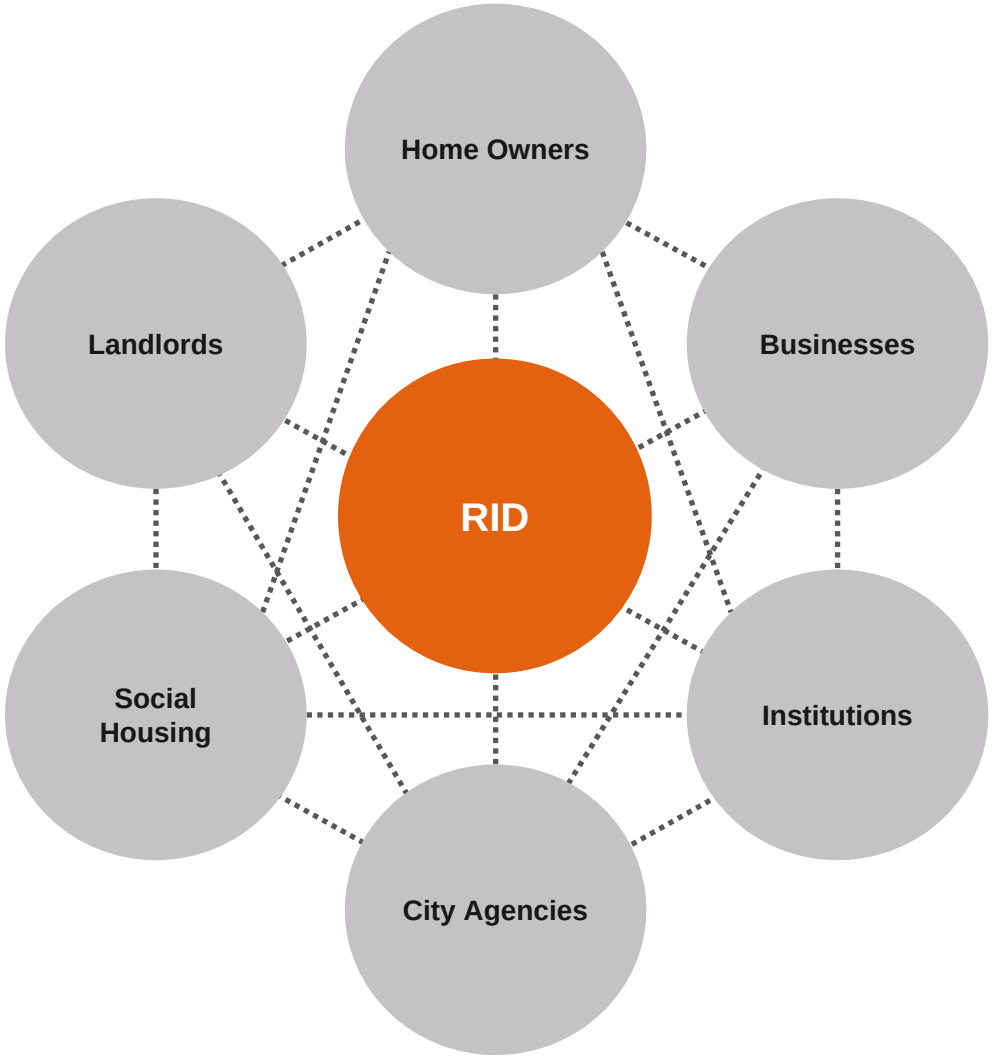
SRF grants and loans

- Federal grants can be used to capitalize the SRF program
- Provides economies of scale regarding cost and effort
- Aggregates relatively small capital needs of individual households

RIDs

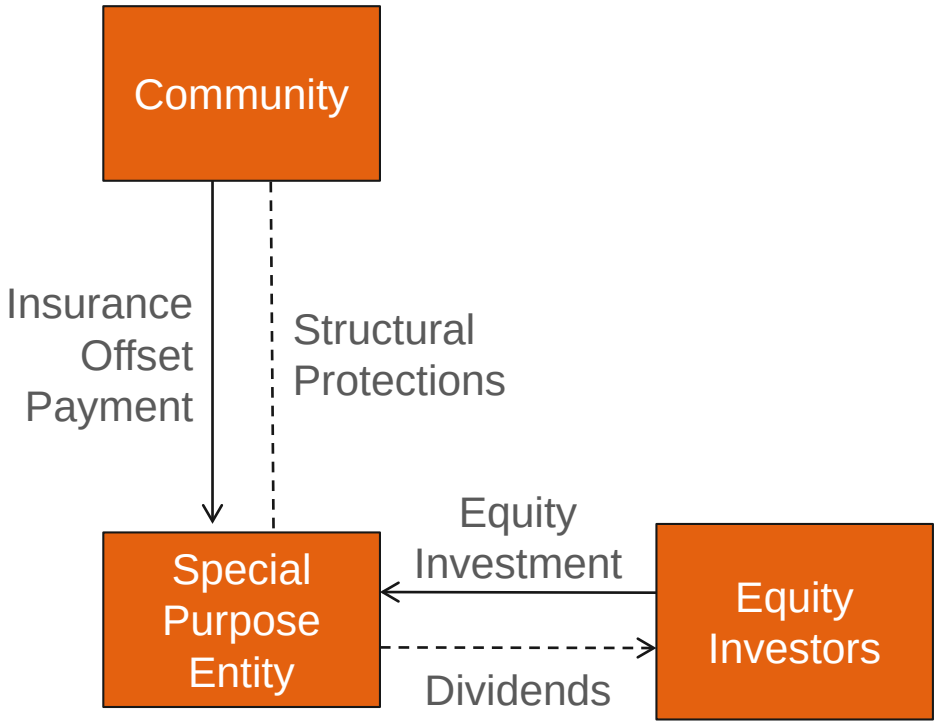
Resilience Improvement Districts

Local non-profit to manage build-out, maintenance and operations of IFPS



Private financing with APD approach

Long-term contract (typically a DBFOM) with a private company



1. Project Company forms a Special Purpose Entity
2. Company raises capital for project construction
3. Service Fee payable upon construction completion
4. Equity and debt at risk for performance failure

Where do we go from here?

What action could be taken?

- Shift framework from the individual to the community
- Change the analysis methodology
- Advocate for active spending on resiliency, not reimbursement

Thank you

Peter Glus PE BCEE

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Director, Big Urban Clients
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3:00 – 3:30 PM | BREAK

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RAMBOLL

3:30 - 4:15 PM

Case Study and Discussion: Financial Resilience

This Case Study session will focus on how to increase financial resilience by accounting for the full lifecycle of assets through alternative project delivery models. This highly-interactive session will examine specific projects and provide the opportunity to dialogue with the presenters.

Presenters:

Andrew D. Sawyers, Ph.D., Director, Office of Wastewater Management, U.S. Environmental Protection Agency

Michael Patella, Senior Policy Advisor, Water Infrastructure and Resiliency Finance Center, U.S. Environmental Protection Agency

Case Studies in Financial Resilience

Andrew Sawyers Director, Office of Wastewater Mgmt.

Michael Patella, Water Finance Center

Great Water Cities Summit 2017 Invest4Resilience

EPA's Alternative Project Delivery Goals & Perspective

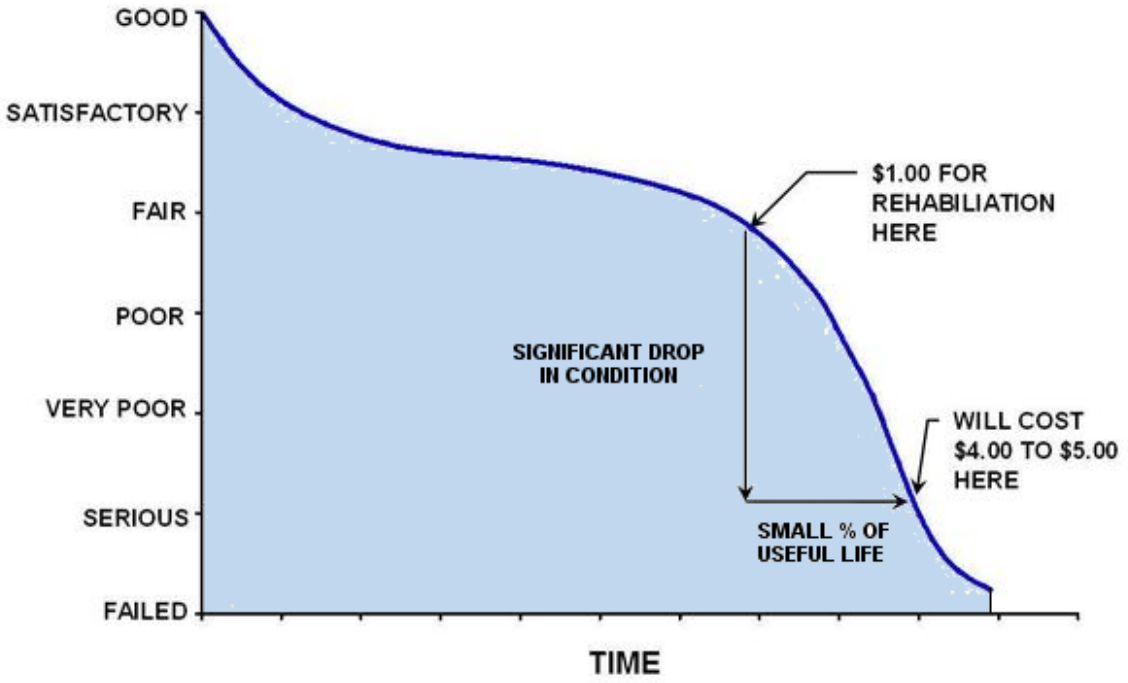
- The Water Infrastructure Challenge
- Key Financial Programs within EPA
- The EPA's Water Finance Center
- EPA's Alternative Project Delivery Goals & Perspective
- Delivery Model Overview
- UNC P3 Study Overview: Case Study examples
- Ongoing Resilience Opportunities
- Final Impressions

Water Infrastructure Challenge

- Aging infrastructure underscores the urgency to reinvest in water infrastructure.
- EPA estimates over **$600 billion** is needed for water infrastructure capital improvements over the next 20 years.
- AWWA estimates **$1 trillion** in pipe replacement needs.
- These challenges require a focus on better **communicating the value of water and forging better partnerships** among stakeholders to deliver state-of-the-art technological and funding solutions.

Water Infrastructure Challenge

- Instead of maintaining assets as scheduled, many asset managers are forced to "fix as fail" for a number of reasons including budget constraints.
- Inadequately maintaining assets and repairing when failing lead to exponentially higher costs.



Adapted from USDOT, Kahn and Levinson, https://www.faa.gov/airports/central/airport_compliance/pavement_maintenance/

EPA's SRF Programs

- SRF programs have a major role in developing sound waste water infrastructure that's important to state and local competitiveness and quality of life.
- SRF programs supports job creation and good paying jobs.
- Critical in responding to critical failures and advancing technology and innovations.
- Important tool in expanding funding opportunities.
- SRF program continues to examine flexibilities to support expansion and implementation ease.

EPA's SRF Programs

- Over the past 2 decades, the SRF programs have made major investments in financing wastewater infrastructure, addressing critical water quality and public health needs.
- The CWSRF programs remain an important vehicle in advancing the infrastructure investment agenda of this administration.
- Reduce infrastructure gap – financial and operational.
- Enhance and promote sustainable revenue models.
- Platform and foundation for leveraging and innovation
- Support the creation of efficient markets.

WIFIA Background

- Federal credit program for water infrastructure authorized in the Water Resources Reform and Development Act (WRRDA) of 2014.
- Federal credit programs are a powerful way to leverage Federal funding:
  - Congress only appropriates money to cover estimated losses (the credit subsidy) and the remainder of the funding is borrowed from and repaid to Treasury;
  - A small amount of Federal funds can support a much larger amount of infrastructure investment.
- For WIFIA, subsidy cost is about 2 percent:
  - Each $1 dollar in appropriated funding will leverage more than $50 in credit assistance;
  - Subsidy rate varies based on the level of riskiness of each loan.

WIFIA Stimulates Investments

- WIFIA was designed to offer credit assistance with flexible terms in order to attract private participation, encourage new revenue streams for infrastructure investment, and allow public agencies to get more projects done with fewer local dollars.

- WIFIA can stimulate capital market investment by structuring WIFIA loans in a way that makes investment in projects attractive to market participants:
  - WIFIA will look to the project's long term repayment horizon rather than focusing on immediate returns;
  - WIFIA may take a subordinate position in terms of the project's cashflow, filling a market gap for secondary capital;
  - WIFIA offers flexible repayment terms, like deferring interest for up to 5 years after construction completion for projects with ramp-up risk.

WIFIA Important Program Features

$20 MIL — Minimum project size for large communities.

$5 MIL — Minimum project size for small communities (population of 25,000 or less).

49% — Maximum portion of eligible project costs that WIFIA can fund.

35 YEARS — Maximum final maturity date from substantial completion.

5 YEARS — Maximum time that repayment may be deferred after substantial completion of the project.

% — Interest rate will be equal to or greater than the U.S. Treasury rate of a similar maturity.

Projects must be creditworthy.

NEPA, Davis-Bacon, American Iron and Steel, and all federal cross-cutter provisions apply.

WIFIA Eligibilities

Eligible Borrowers	Eligible Projects
• Local, state, tribal, and federal government entities • Partnerships and joint ventures • Corporations and trusts • Clean Water and Drinking Water State Revolving Fund (SRF) programs	• Projects that are eligible for the Clean Water SRF • Projects that are eligible for the Drinking Water SRF • Enhanced energy efficiency projects at drinking water and wastewater facilities • A project for repair, rehab or replacement of an aging treatment works, community water system, or water distribution or wastewater collection facility • Brackish or seawater desalination, aquifer recharge, alternative water supply, and water recycling projects • Drought prevention, reduction, or mitigation projects • Acquisition of property if it is integral to the project or will mitigate the environmental impact of a project • A combination of projects secured by a common security pledge or submitted under one application by an SRF program

EPA Financial Programs Supporting Resilience

- Modernizing our infrastructure supports community well-being, economic prosperity and financial resilience.
- Meeting water needs through expanded infrastructure investments is one of the top priorities for the SRFs and WIFIA. The wide range of financing options and project eligibilities enable these programs to meet this priority.
- The SRF programs are excellent examples of how the federal government can successfully work with our state partners to improve our infrastructure.
- Federal credit programs such as WIFIA are a powerful way to leverage federal funding and encourage private investment in infrastructure projects.
- SRF and WIFIA are working in tandem to help reduce infrastructure gaps.
- The programs support sustainable revenue models and more efficient markets
- EPA's Water Finance Center is actively engaged around project delivery.

Water Infrastructure and Resiliency Finance Center

The Water Finance Center is an **information and assistance center**, helping communities make informed decisions for **drinking water, wastewater, and stormwater infrastructure** to protect human health and the environment.

Research

Identify financial solutions to help communities meet infrastructure needs.

Advise

Provide advice, support, and technical assistance to stakeholders

Innovate

Provide expertise and add value to the national water infrastructure conversation.

Network

Build relationships with government partners and stakeholders.

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EPA's Alternative Project Delivery Goals & Perspective

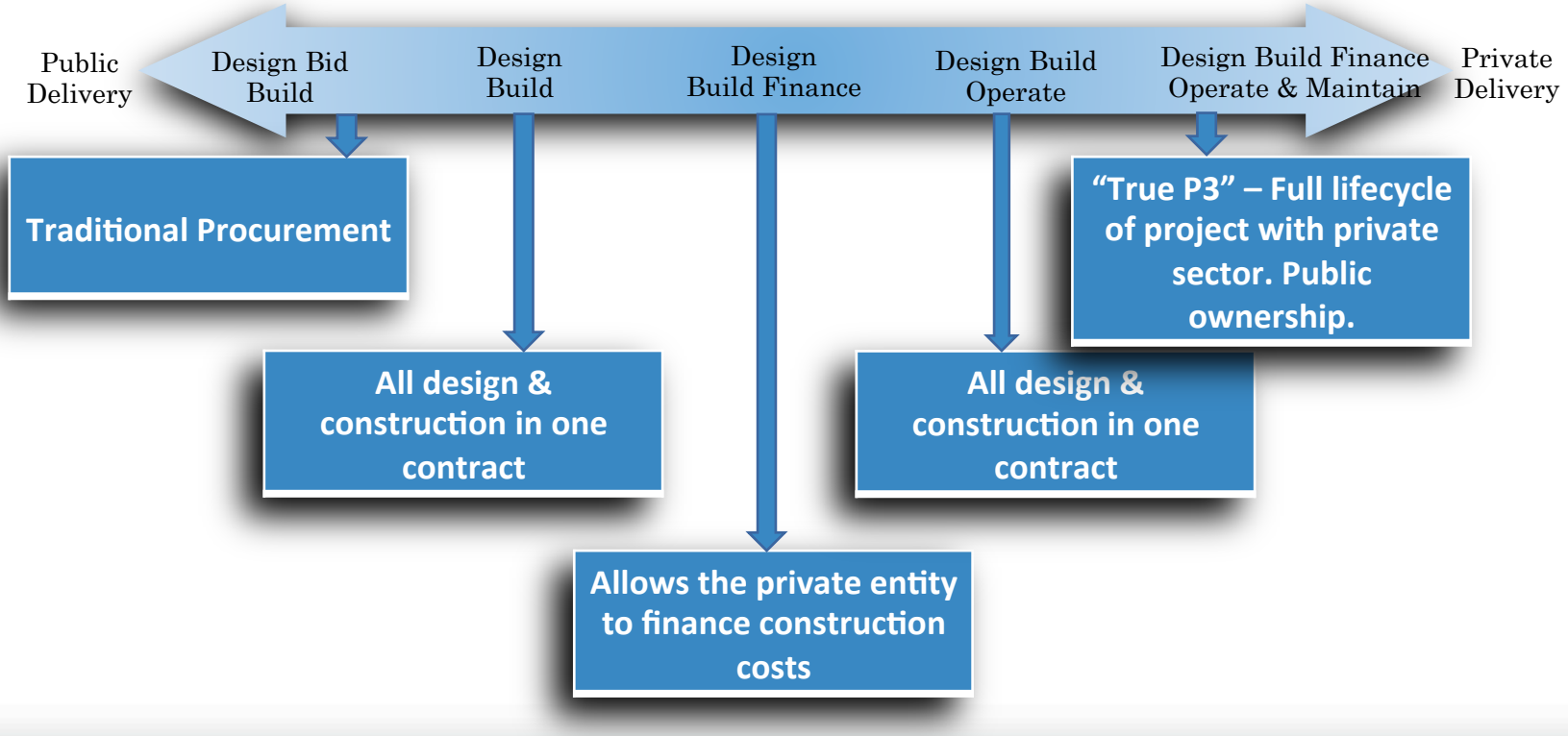
- EPA looks at public-private and public-public partnerships active in the water sector to determine if there is value in communities pursuing P3s opportunities for project delivery.
- The goal is to help communities, utilities and municipalities make the most informed decisions based on their specific circumstances.
- Municipalities considering alternative project delivery models could potentially improve resilience by properly allocating risk and considering full life cycle cost.

Alphabet Soup of Terms

• DBB	Design Bid Build
• DB	Design Build
• DBO	Design Build Operate
• DBOM	Design, Build, Operate, Maintain
• DBOF	Design, Build, Operate, Finance
• Concession	Giving up something
• CMAR	Construction Manager at Risk
• PPP	Private Public Partnership
• P3	Private Public Partnership

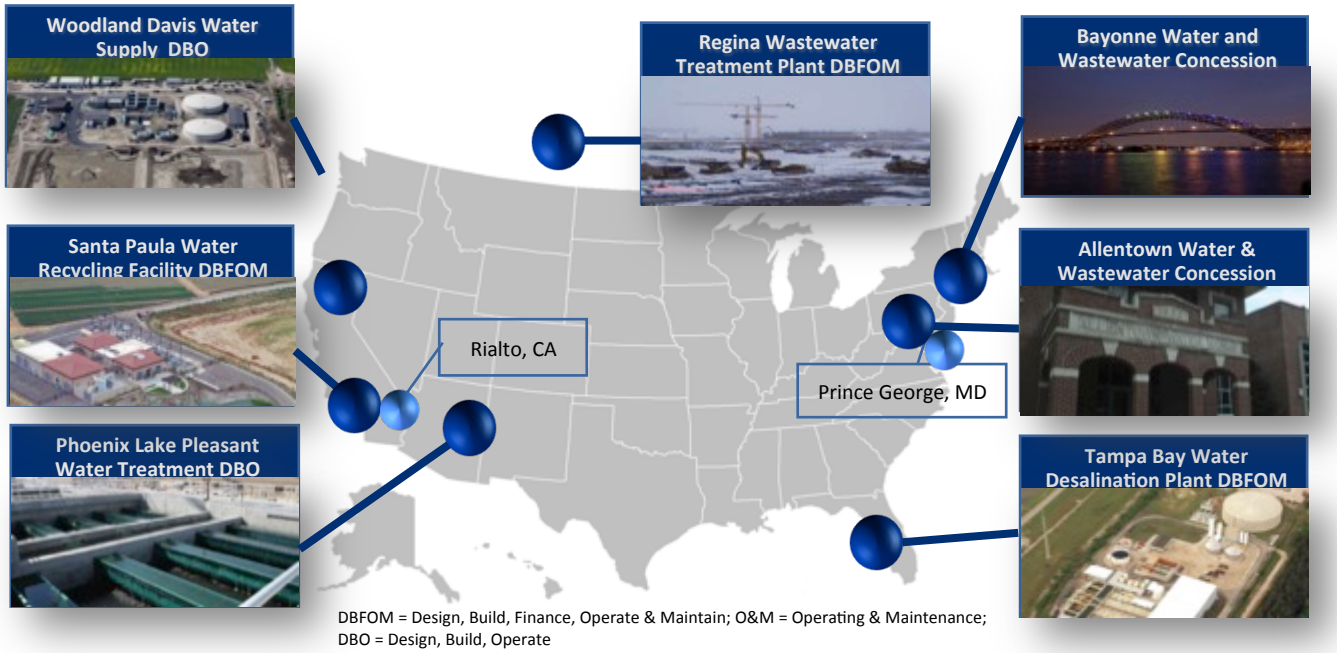
Project Delivery Models

What amount of Procurement is done directly with the Public Sponsor versus a private entity?



Public Private Partnership (P3) Study

Under EPA's Cooperative Agreement, the University of North Carolina's Environmental Finance Center examined seven transactions in-depth (●) and three other notable transactions (●).



The research examined the proposed versus realized benefits, the processes involved in closing transactions, and the performance of the agreements over the useful life of the assets.

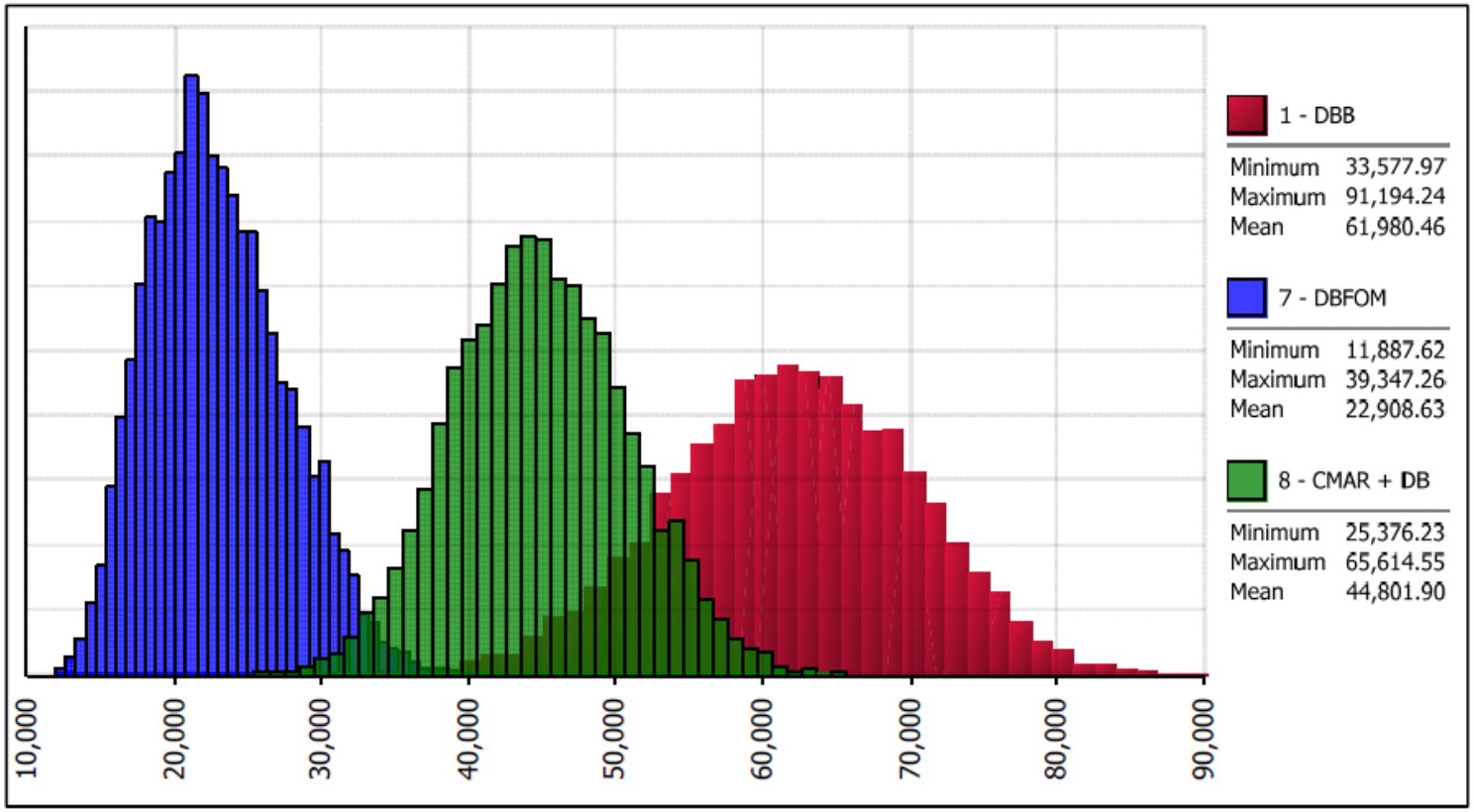
Impressions of Financing Alternative Delivery Mechanisms

- Potentially reduced project cost
- Potentially reduced risks falling on public sector
- Lower cost of capital
- Lower life cycle costs
- Reduced segmentation

Example of Display of Variable Risk Cost

Source Deloitte Analysis submitted in report to Regina

Figure 3 - Estimated Total Project Risk Costs For Each Delivery Model (NPV, $thousands)



Going Beyond the Savings

- Higher quality of asset management or service delivery (contractually required)
  - Woodland Davis
  - Santa Paula
- Tapping into Public Entity Equity (for water or other benefits)
  - Rialto
  - Bayonne
  - Middletown

What's Included in Project Cost? Example from Rialto Concession

- $43.1 million for operational funding and rate stabilization to accommodate the 4 year phasing of the rate increase
- $41.0 million for capital improvements
- $30.0 million for catch-up lease payments from RUA to the City
- $27.4 million to refinance existing debt obligations
- $24.3 million for debt issuance costs, including underwriting fees, debt service reserves, and RUA reserves
- $11.2 million for due diligence and other transaction costs

Agenda #

CITY OF RIALTO

AGENDA REPORT
For the City Council/RUA Meeting of March 27, 2012

Ongoing Resiliency Opportunities

- Bay Park Wastewater Treatment Plant in Nassau, New York - $233+ million in savings through a public-private partnership with Suez/United Water for the operation and maintenance of wastewater facilities, including a guaranteed $10 million in annual savings

- Closed in 2014, time will tell about continued success. To date, it seems successful.

Ongoing Resiliency Opportunities

The current P3 project pipeline shows ample opportunity to develop resilient systems.

Transaction Name	Status	Local Government
Arkansas Valley Conduit	RFI	US Bureau of Reclamation
Eastern New Mexico Rural Water System	RFI	US Bureau of Reclamation
Kachess Drought Relief Pumping Plant	RFI	US Bureau of Reclamation
Paradox Valley Unit	RFI	US Bureau of Reclamation
Yuma Desalting Plant	RFI	US Bureau of Reclamation
Doheny Desalination Plant - South Orange County	Pre-Launch	Orange County Water System
Los Angeles Satellite Water Reclamation Facility	Expressions of Interest	Los Angeles Bureau of Sanitation
Pennsylvania Stormwater Runoff System P3	RFQ returned	Chester, Pennsylvania Stormwater Authority
Fargo-Moorhead Area Diversion P3	Shortlisted Proponents	Flood Diversion Board of Authority
Grand Prairie Irrigation P3	Expressions of Interest	White River Regional Irrigation Water Distribution District (WRID)
Santa Clara Expedited Purified Water P3	Shortlisted Proponents	Santa Clara Valley Water District
Huntington Beach Desalination Plant	Preferred Proponent	
Louisiana Parish Wastewater Facility	RFP Returned	Ascension Parish
East/West 84 inch Force Main	Pre-Launch	Miami-Dade County
Miami-Dade Water Distribution System Storage Tank & Main replacements	Pre-Launch	Miami-Dade County
Peak Flow Management Facilities	Pre-Launch	Miami-Dade County
Northwest Wellfield Water Treatment Plant	Pre-Launch	Miami-Dade County
West District Wastewater Treatment	Pre-Launch	Miami-Dade County
Indianapolis Airport Water Improvement	Shortlisted Proponents	Indianapolis Airport Authority
Michigan Highway Pump Station	Pre-Launch	Michigan Department of Transportation (MDOT)
Phoenix Stormwater Pump Rehabilitation Project	Pre-Launch	Arizona Department of Transportation (ADOT)
South Miami Heights Water Treatment Plant	Transaction Launch	Miami-Dade Water and Sewer Department
City of Wichita Water System	Pre-Launch	City of Wichita

Source: Infradeals, Moody's Investors Service.

Final Impressions

- You sometimes pay for what you get. Private Capital can offer stabilization over the long term.
- Blended interest rates can offer Cost of Capital opportunities (ex. WIFIA).
- Higher rates of returns are sometimes compensation for additional risk born by the private sector.
- Access to capital is rarely the biggest driver. It tends to be the ability to pay.
- Benefits accrue to areas other than water (ex. pensions, general obligations).
- The Transfer of public management eases political will issues making systems more willing operate efficiently.
- Water conservation and demand are the key drivers in unexpected issues.
- These projects often lead to and/or require rate stabilization.

Water Infrastructure and Resiliency Finance Center

WIRFC@epa.gov
www.epa.gov/waterfinancecenter

Great Water Cities Summit 2017 Invest4Resilience

4:15 - 4:30 PM

Wrap Up and Synopsis

Presenters:

Thomas Kunetz, Assistant Director of Engineering, Metropolitan Water Reclamation District of Greater Chicago, WEF, USA

Lynn Broaddus, President, Broadview Collaborative, WEF, USA

Thank you for attending

Send comments or questions to gwc@wef.org