



项目地址：桑迪飓风所影响的美国东海岸区域
项目委托：美国住房与城市发展部、桑迪飓风重建特别工作组
景观设计：大都会建筑事务所纽约办公室
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设计团队：Isaiah Miller、Stephen Clipp、Cyrus Penarroyo、Matthew Davis、Filippo Nanni、Maria Saavedra
水资源管理及工程：DHV集团
景观与土地利用规划：巴摩里联合事务所
经济顾问：HR & A咨询公司
图形设计：2×4设计工作室
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Location: Hurricane Sandy affected regions along US Eastern coast
Client: US Department of Housing and Urban Development, Hurricane Sandy Rebuilding Task Force
Landscape Architecture: OMA New York
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Water Management and Engineering: Royal Haskoning DHV
Landscape and Land-use Planning: Balmori Associates
Economic Consultant: HR & A Advisors
Graphics: 2x4 Design Studio
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1. 利用新霍伯肯市车站发挥防御功能
1. New Hoboken Station as defense

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防御、延迟、储存、排出

——美国霍伯肯市综合防洪策略

Resist, Delay, Store, Discharge

— A Comprehensive Flood Strategy for Hoboken, USA

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摘要 ……

桑迪飓风影响的区域——新泽西州的泽西市、霍伯肯市和威霍肯市——极易受到洪水和风暴的影响。面对综合的城市环境，一次解决一栋住房的解决方案毫无意义。我们需要一个意识到城市的密度、肌理的复杂性，顾及到多样化的社区的每一个利益相关者，并且守护这座城市（包括其资产与公民）的综合途径。

关键词 ……

飓风；桑迪；防洪策略；弹性

Abstract …

Within the Sandy-affected region, New Jersey's communities of Jersey City, Hoboken and Weehawken are susceptible to both flash flood and storm surge. As integrated urban environments, discreet one-house-at-a-time solutions do not make sense. What is required is a comprehensive approach that acknowledges the density and complexity of the context, galvanizes a diverse community of beneficiaries, and defends the entire city, its assets and citizens.

Key words …

Hurricane; Sandy; Flood Strategy; Resiliency

聚焦于高密度的城市环境，该项目方案的首要原则是整合。防御的工具应被看作应是城市环境固有的，并成为城市活动的支撑——如同大坝开启了阿姆斯特丹的历史。这要求全息动态的手段，首先要认识到系统复杂性的作用，并与自然洪流为友，而非为敌。

途径：通过基于风险的方法实现实效性弹性

桑迪飓风影响的区域是一段绵长的沿海地带，其中许多居民和物资都处于危险之中。我们无法做出一个面面俱到的解

决方案，所以我们需要辨识我们最易受到影响的资源，并安排优先次序、巧妙地对其进行建设。我们将防护结构融入建成环境，随着时间的推移，在防护方面的投资也将助推社区和经济增长，使得我们在面临风险时更具弹性。基于对于理解和量化洪水风险的期望，我们形成了方案。在这样的过程中，我们能更好地辨识出最易受影响、最具价值和最具潜力的机遇（这正是我们关注的重点）。在不同的地理尺度，根据我们团队中专家提出的一系列解决措施，通过机遇矩阵得出需要我们关注的区域。所得出的机遇分析的结果由一系

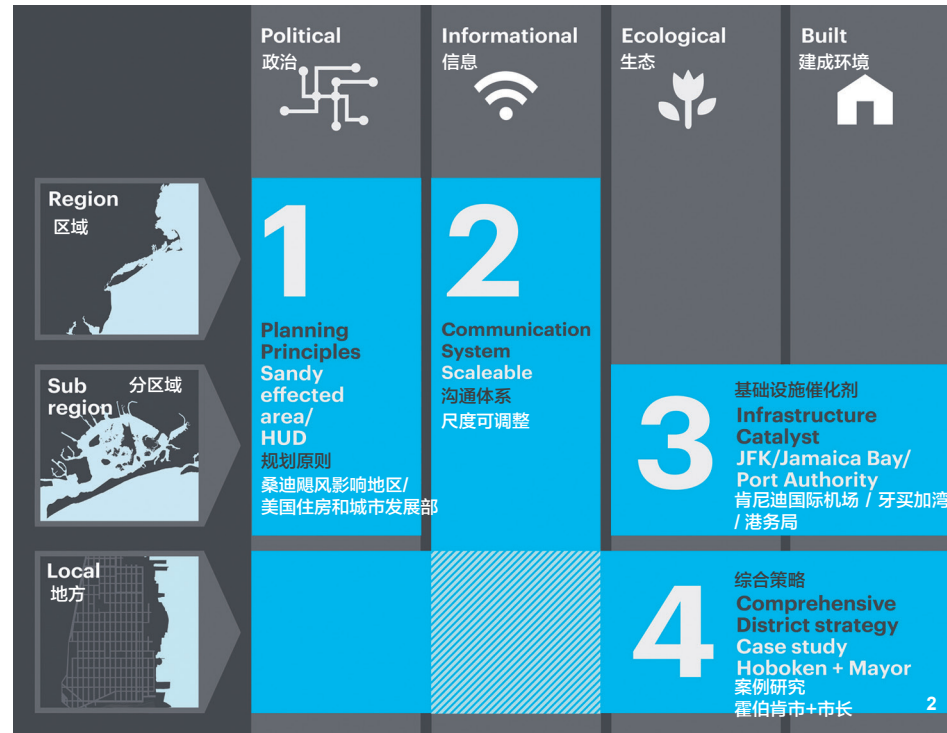
列个案例分析组成，展示我们的方法如何改变我们的区域的可能性。

规划原则：明智抉择弹性提升点

在一个受制于洪水威胁的地区，弹性提升点的选址对支持区域的未来发展至关重要。这意味着提升将集中在那些能够取得最佳防御效果的区域，反之，减少那些无法防护的地区暴露程度，从而将海岸打造为一片既安全，又能供人们享用的空间。

沟通体系：传达对弹性的共识

洪灾之前、之中和之后都存在着沟



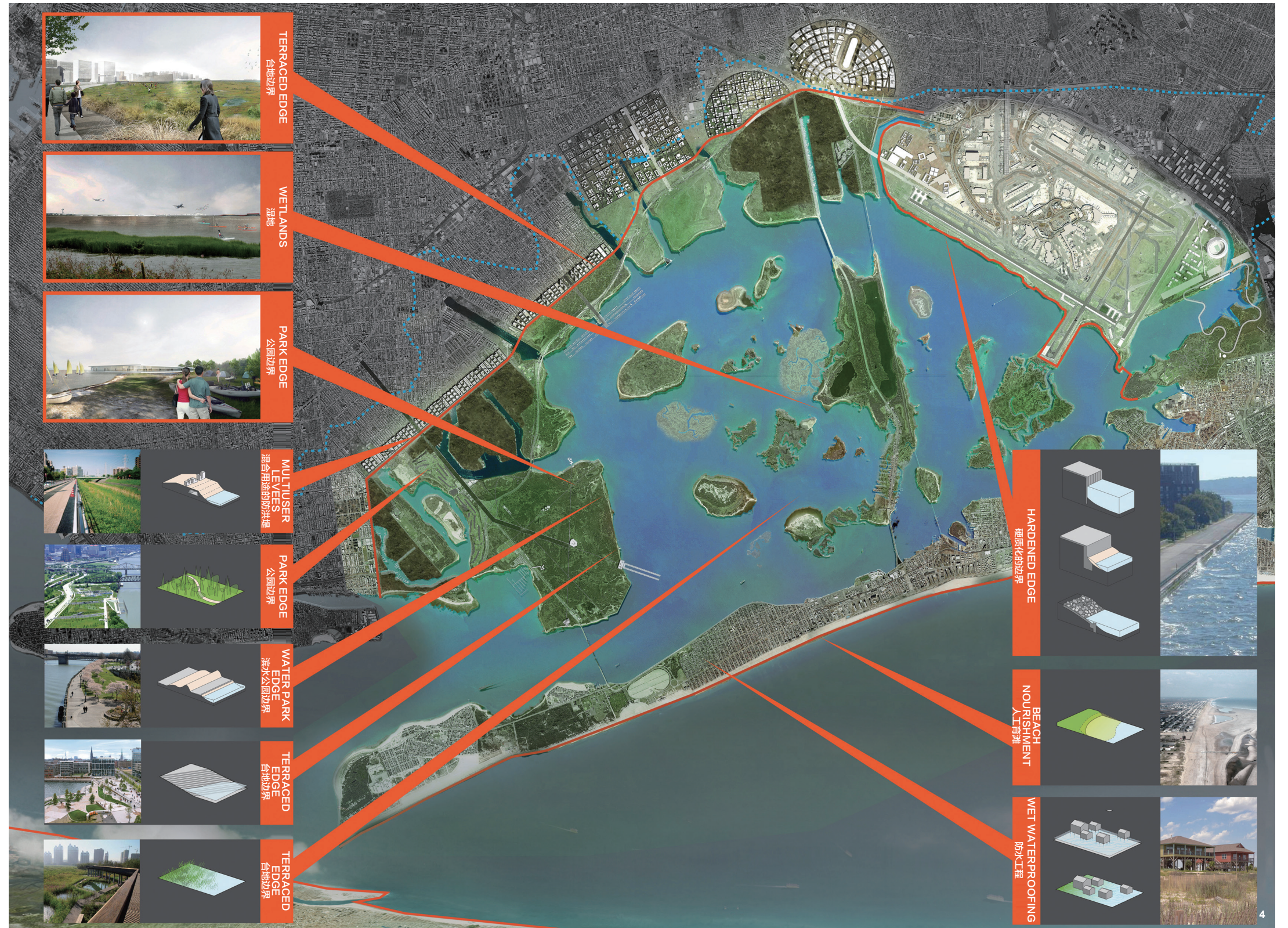
通方面的挑战。在预测洪水和弹性建设方面，利益攸关方形成对于风险和其影响的共识极为必要。虽然我们一直致力于扩张式建设，但是更多的精力应放在提高信息可获得性方面——例如，编制一部关于洪水风险的基础知识宣传手册。在应对洪水的过程中有大量的信息需要沟通。合并和过滤信息能够更好地服务于使用者——既包括政府决策者、应急人员、社区团体，也包括普通市民——例如，可以通过彭博电视或全美娱乐体育电视网来宣传洪水的知识。如果出现信号中断或失效，我们可以采用的备选的沟通方案会有哪些？我们怎样才能建立起有效的沟通？

基础设施催化剂：成为更具弹性的城市
肯尼迪国际机场是区域基础设施的重

要节点。作为牙买加湾的一部分，机场也受到洪水的威胁。虽然机场自身能够应对很多问题，但是利用这一资源提升牙买加湾的普遍防洪能力仍是一个机遇。这就意味着可以将机场并入更高级别的防护系统中，并将其作为提升弹性的催化剂。这种增长会刺激当地的转型，并为之提供资金支持，使牙买加湾成为纽约市未来的经济中心。

综合策略：建立社区活力

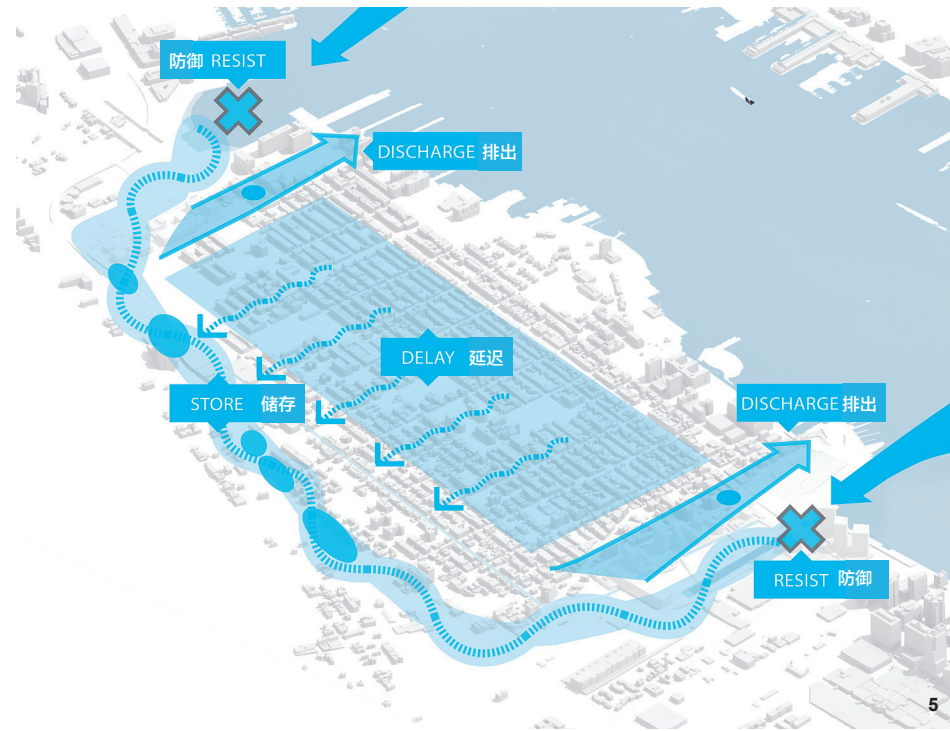
霍伯肯市是一个易受到洪水和风暴影响的地区。我们的方案将政治、生态和经济的要素整合起来，提出了一个综合的防洪策略——防御、延迟、储存、排出——不仅能保护整座城市，也能促进经济、市政和休闲设施的建设。这一综合性的策略



利用硬性基础设施和软性的景观来构建海岸抵御系统（防御）；提出政策建议使得城市肌理能够减缓径流（延迟）；构建一个绿色环路来存储雨水（储存），水泵能

够将水排出（排出）。LAF
注释
更多信息请参见<http://rdsd.org/>，以及<http://www.rebuildbydesign.org>。

2. 机遇矩阵
3. 识别机遇
4. 肯尼迪机场作为基础设施催化剂
2. Matrix of opportunities
3. Identifying opportunities
4. JFK Airport as infrastructure catalyst



With a focus on high-density urban environments, OMA's driving principle is one of integration. The tools of defence should be seen as intrinsic to the urban environment, and serve as a scaffold to enable activity — much in the same way that the dam is the genesis of the city of Amsterdam. This will necessitate an approach that is both holistic and dynamic; one that acknowledges the complexity of systems at play; and one that works with, rather than against, the natural flow.

Approach: Achieving Effective Resiliency through a Risk-based Approach

The Sandy affected region is a long

coastline with many assets at risk. A comprehensive solution is beyond our means, so we will need recognize where best to focus our resources for greatest impact, and need to prioritize, build smart. Integrated into our built environments, over time our investments in protection should also empower our communities and our economy, allowing us to grow into resiliency. Our approach is framed by a desire to understand and quantify flood risk. In doing so, we are better placed to identify those opportunities that present the greatest impact, the best value, and the highest potential (our areas of focus). Our matrix of opportunities charts our focus

areas, at different geographic scales, against the spectrum of solutions represented by our team's expertise. The resulting opportunities are a selection of case studies that showcase how our approach might be used to transform our region.

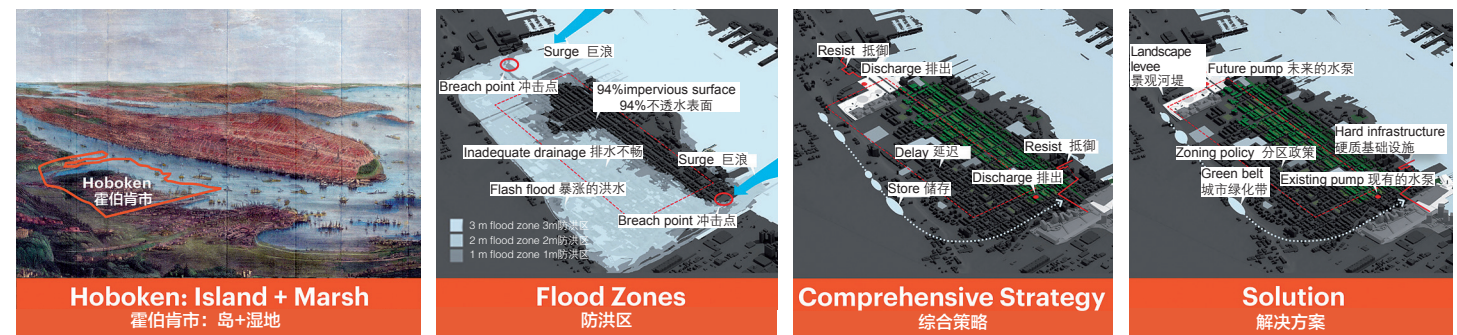
Planning Principles: Making Smart Decision on Where to Grow Resiliently

To support the future growth of the region, in a flood risk constrained environment, deciding where to grow will be critical. This will mean focusing new growth in those areas that can be optimally defended, and conversely, limiting exposure in those areas that cannot. Remaining safe, but also enjoying the shore.

Communication Systems: Communicating a Common Understanding of Resiliency

Challenges are posed to communications before, during, and after a flood event. In anticipating flood, and building resiliency, it is essential for all stakeholders to share a common understanding of the risks and their implications. Although efforts continue to be made at outreach and capacity building, more can be done to make information

5. 策略示意图
6, 7. 霍伯肯市综合防洪策略
5. Strategy diagram
6, 7. Comprehensive strategy for Hoboken





accessible — a flood risk 101. A profusion of information must be negotiated in navigating a flood event. Consolidating, and filtering, this information can better serve users — whether government decision makers, first responders, community groups, or private citizens — a Bloomberg, or ESPN, for flood. In the event of a disruption or failure, what alternative systems of communication are at our disposal? How can we build resiliency in our communications?

Infrastructure Catalyst: Growing to a more Resilient City

JFK International Airport is a vital node in the regions infrastructure. As part of Jamaica Bay, it is also highly vulnerable to flood risk. Although the airport is capable of ‘taking care if its own problems’, there is an opportunity to leverage this asset to promote the common flood defence of the Jamaica Bay area. That means integrating the airport into a larger tiered defence system, and using the airport as a catalyst for growth; growth that will help fuel, and fund, the transformation of the area, and position Jamaica Bay as a future economic for New York City.

Comprehensive Strategy: Building Community-wide Resiliency

Hoboken is susceptible to both flash flood and storm surge. Our project capitalizes on a combination of political, ecological, and economic factors to create a comprehensive flood strategy — resist, delay, store, discharge — that both defends the entire city, and enables commercial, civic, and recreational amenities to take shape. Our comprehensive strategy deploys both hard infrastructure and soft landscape for coastal defence (resist); recommends policies to enable the urban fabric to slow down water (delay); a green circuit to trap water (store) and water pumps to support drainage (discharge). **LAF**

NOTE

For more information, please visit <http://rdsd.org/>, and <http://www.rebuildbydesign.org>.

- 8. 霍伯肯市鸟瞰图
- 9. 软性边界发挥防御功能
- 10-12. 公园发挥防御功能，作为容纳洪水的空间。
- 8. Bird's eye view of Hoboken
- 9. Soft edge as defense
- 10-12. Park as defense, which can also withstand flooding.

