Baltimore's natural and built systems are colliding.

**HIGHER GROUND**
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape
The city has over 16,000 vacant buildings and properties.
And is at increased risk from flooding as storms become more volatile and less predictable.
Higher Ground is a landscape proposal to simultaneously address vacancy and stagnation in blighted communities and to reduce the risk of flooding in low lying areas.
The early city was built around its water system c. 1700. At one time the Jones Falls powered mills that produced over 80% of the world's sail cloth.
The city expanded as an industrial hub with the advent of the county's first railroad, introduced in the mid 1800's.

The geography of new shipping routes rendered the water-powered mills obsolete.
Neighborhoods grew to house the expanding work force.
And the city extended its boundaries to encompass over 75 square miles.

Highways extended the reach for workers and the primary means of transportation for industries shifted again.
These new exo-centers and their arterial highways like Route 40 sliced through the city neighborhoods in the 1970’s, isolating residents from the new job centers, and creating a steady increase in paved surfaces deep into the watershed.
To compete with the allure of the expanding suburbs, the city began several waterfront revitalization projects in the early 1980's.

Rerouting federal funds that had been awarded to west Baltimore to address poor conditions, the Hyatt waterfront hotel at Inner Harbor and the promenade bulkheads in Fell’s Point were built with these community-based funds.
Sparked by the new waterfront activity, many of the abandoned mill buildings were renovated in the late 1980’s, creating charming pockets of retail, residential and restaurant activities.

These upscale communities thrived in geographically separated areas of the city.
While some areas of city began to thrive in the 1980’s and 1990’s and continue to prosper,
the effects of isolation and work displacement in east and west Baltimore have been staggering, especially for African-American communities.

**INCOME:**

Maryland is the richest state in the United States of America, with a median household income of $69,272 according to the 2010 census.

Median Household Incomes:

- United States: $50,500
- State of Maryland: $69,272
- Baltimore City: $41,800
- West Baltimore: $24,300
HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

RACE BY DECADE: 1940

Map and bar chart showing the percent population Black by census tract in Baltimore in 1940.

RACE BY DECADE: 1950


HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape
RACE BY DECADE: 1960


**HIGHER GROUND**
Leveraging Baltimore's Topography to Increase Social and Climate Resiliency through Landscape
RACE BY DECADE: 1970

HIGHER GROUND
Leveraging Baltimore's Topography to Increase Social and Climate Resiliency through Landscape

http://www.nhgis.org
HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

RACE BY DECADE: 1980

MINNESOTA POPULATION CENTER. NATIONAL HISTORICAL GEOGRAPHIC INFORMATION SYSTEM: VERSION 2.0. MINNEAPOLIS, MN: UNIVERSITY OF MINNESOTA 2011. HTTP://WWW.NHGIS.ORG
Census Tract 1990 Baltimore Black

RACE BY DECADE: 1990

Percent population Black:

- 0.000 - 0.0908
- 0.09009 - 0.2324
- 0.2325 - 0.4591
- 0.4592 - 0.6853
- 0.6664 - 0.8380
- 0.8381 - 0.9505
- 0.9506 - 0.9973

Maryland Total

Baltimore Black

Baltimore White


HIGHER GROUND
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RACE BY DECADE: 2000


HIGHER GROUND
Leveraging Baltimore's Topography to Increase Social and Climate Resiliency through Landscape
RACE BY DECADE: 2010

Percent population Black:

- 0.01667 - 0.1802
- 0.1803 - 0.3489
- 0.3490 - 0.5881
- 0.5882 - 0.7581
- 0.7582 - 0.8550
- 0.8551 - 0.9331
- 0.9332 - 0.9825

Maryland Total
Baltimore Black
Baltimore White


HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape
The city became increasingly divided as the population shrank. Baltimore's numbers plummeted as the state population soared, creating a significant gap in the political will of the state and the needs of the city.
HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

Vacant Housing Units in Baltimore City

Vacant Housing Units in 1940

MARYLAND INSTITUTE COLLEGE OF ART

http://www.nhgis.org
Vacant Housing Units in Baltimore City

MARYLAND INSTITUTE COLLEGE OF ART

Vacant Housing Units in 1950

- Total Housing Unit
- Vacant Housing Unit

Year


Number of Housing Units

0 50,000 100,000 150,000 200,000 250,000 300,000 350,000

Vacant Housing Units in Baltimore City

http://www.nhgis.org

HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape
Vacant Housing Units in Baltimore City

HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

Vacant Housing Units in Baltimore City

Vacant Housing Units in Baltimore City

There are currently 33,500 vacant lots and buildings in Baltimore City. This amounts to 15% vacancy city-wide, with some neighborhoods exceeding 70% vacancy.

According to recent research, a stable community can tolerate up to 4% vacancy.

Built in the 1800’s, most of these vacant buildings are well above the risk of flooding.

These neglected communities offer great potential to be reimagined in the face of climate change.
The Inner Harbor was under construction as the emerging FEMA flood guidelines were being debated. Seen in 2011, the Inner Harbor promenade is under water.
HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape
HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

Harbor view Towers
Towers At Harbor Court Condo
Pier Homes At Harbor View
Belts Wharts Apartments
Residences At Henderson’s

Anchorage Tower Condominium
Anthem House
Silo Point
The Eden
Scarlett Place Condominium
HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape
Wedding ceremony is disrupted, July 2016.
Inundation Sequence shows flooding scenarios along the Gwynn's Falls. Stream gage values are based on the historical record of Hurricane Agnes (1972).

Different stage of the sequence reflects the percentage of Agnes rainfall.

<table>
<thead>
<tr>
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Stage 8
Stage 7

HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

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*Stage 7 reasoning and discharge values.*
### Stage 5

**Agnes % reasoning**

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## Stage 4

### HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

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### Stage 3

**Stage 3**

**HIGHER GROUND**
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

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*Normal Stream Level(2014-15): 34*
Stage 2

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*Higher Ground*

Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

Stage 2
Stage 2 with vacants in project area well above the flooding
HIGHER GROUND  
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

Phase 1 New Intertidal Wetlands and Industrial redevelopment

Develop light industrial and manufacturing sites along the truck route. 1,720 vacant sites

Wetlands along the Gwynns Falls in the intertidal zone and the floodplain:
142 vacant properties, 14.80 million ft² land
water volumes: TBD

Youngsan Park by West 8

Phase 1 New Intertidal Wetlands and Industrial redevelopment
HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape

Phase 2 Greenway along buried stream, new neighborhood parks

Neighborhood parks to engage each community in the solution for flooding and vacancy:
1,960 vacant properties, 3.14 million ft² land

Buffer along the Gwynns Falls for ecosystem support and community edge:
4,080 vacant properties, 20.84 million ft² land

water volumes: TBD

Phase 2 Greenway along buried stream, new neighborhood parks
Phase 3 New greenway along stream and mixed use development

Provide a variety of use redevelopment within communities.

1,030 vacant sites

Mid-neighborhood greenway for connectivity

3,250 vacant properties, 11.4 million ft² land water volumes: TBD

Higher Ground
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape
New canal waterfront development with public promenades

1,000 vacant sites

Phase 4 New canal waterfronts

HIGHER GROUND
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape
**Phase 5 Greenway along MLK blvd**

Complete re-use of vacant sites within the district.
6,000 vacant sites

Eastern-most neighborhood boundary park and major connector.
2,520 vacant properties, 6.80 million ft² land

Water volumes: TBD

*Higher Ground*
Leveraging Baltimore’s Topography to Increase Social and Climate Resiliency through Landscape
The completed project addresses:
21,600 vacant sites, or 2/3 of the total in the city,
reducing total vacancy from 15% to 5%.

Higher Ground Notes
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Next steps:
Develop detailed studies of reduction of flood risk based on this proposition and inform the design iteratively.

Submit the plan to the City of Baltimore Sustainability Office for inclusion on the city’s DP3 Hazard Preparedness plan for FEMA
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Authors:
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Higher Ground Notes