NATIONAL ACADEMIES Sciences Engineering Medicine

Public Infrastructure for Effective and Equitable Climate Mitigation and Adaptation: A Workshop

Policy Implications at Regional and Strategic Levels

How Do You Get to "JUST Design"

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NASEM (Virtual)"

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CHANGE

You are living in the period of time that will produce more change for humanity than any previous era in history. It is a time of extraordinary importance that will fundamentally reshape almost every aspect of your life … Wholesale change is taking place in almost every segment of your reality-and the pace will only increase in the coming years

John Peterson

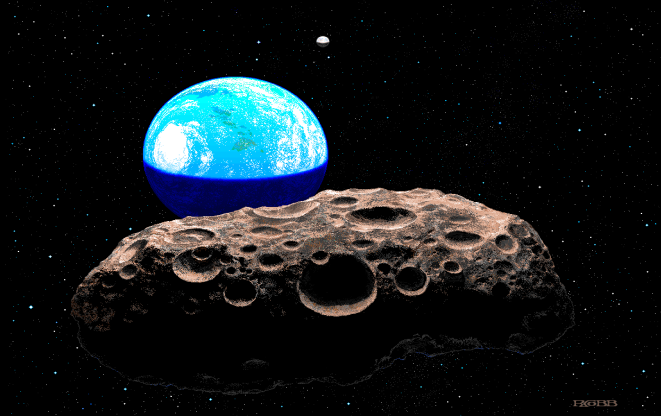
The Road to 2015 (1994)

The 21st Century

"Toto, I've a feeling we're not in Kansas anymore”

The 21st Century

- Demographic Dynamics
- Aging/Outdated Infrastructure
- Pressures for Development
- Technological Surge
- Social Awareness
- Climate Change
- Volatile, Uncertain, Complex, Ambiguous National and World Situations Climate



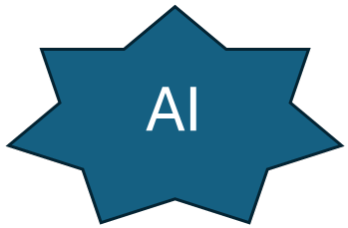
We Have a Lot to Do!!

AND

It Must be Fairly Accomplished

JUST Design

Principles of Just Design



1. **Equity and Inclusion:**
   - **Fair Access**: Ensure all communities, especially historically underserved ones, have equitable access to infrastructure services like transportation, clean water, and internet connectivity.
   - **Community Engagement:** Actively involve community members, particularly those from marginalized groups, in planning and decision-making processes to ensure their needs and perspectives are addressed

2. **Sustainability:**
   - **Environmental Justice**: Design infrastructure projects that minimize environmental harm and distribute environmental benefits equitably, avoiding disproportionate impacts on low-income and minority communities .
   - **Resilience**: Develop infrastructure that can withstand and adapt to climate change and natural disasters, protecting vulnerable populations .

3. **Economic Justice:**
   - **Job Creation:** Ensure infrastructure projects create local jobs and economic opportunities, particularly for disadvantaged communities.

Practice in Just Design

1. **Participatory Planning:**
    - Use participatory design processes to engage community stakeholders in all phases of project development, from conception to implementation.
    - Employ tools like public meetings, workshops, and digital platforms to gather input and feedback from diverse populations

2. **Data-Driven Decision Making**:
    - Utilize data to identify and **address disparities in infrastructure** provision and impact. Geographic Information Systems (GIS) and other data analytics tools can help pinpoint areas of need and track project outcomes .

3. **Policy and Regulation:**
    - Implement policies that mandate equitable practices in infrastructure projects. For example, the **inclusion of equity impact assessments** in planning processes can help identify potential inequalities and mitigate them .

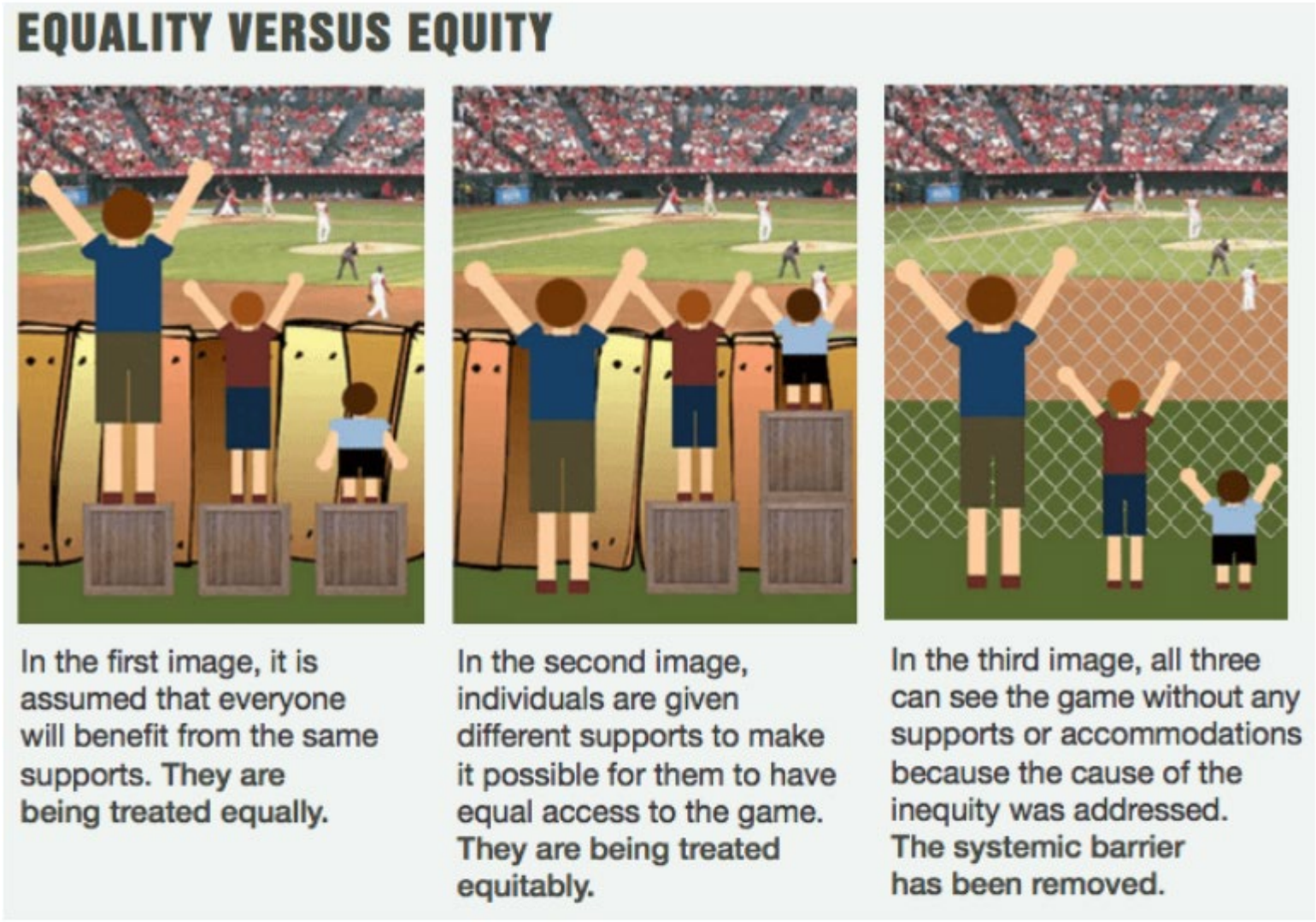
What Do You Mean – Just Design

- Just design = just get the job done – let's see some progress on the site - 0n time/on budget

OR

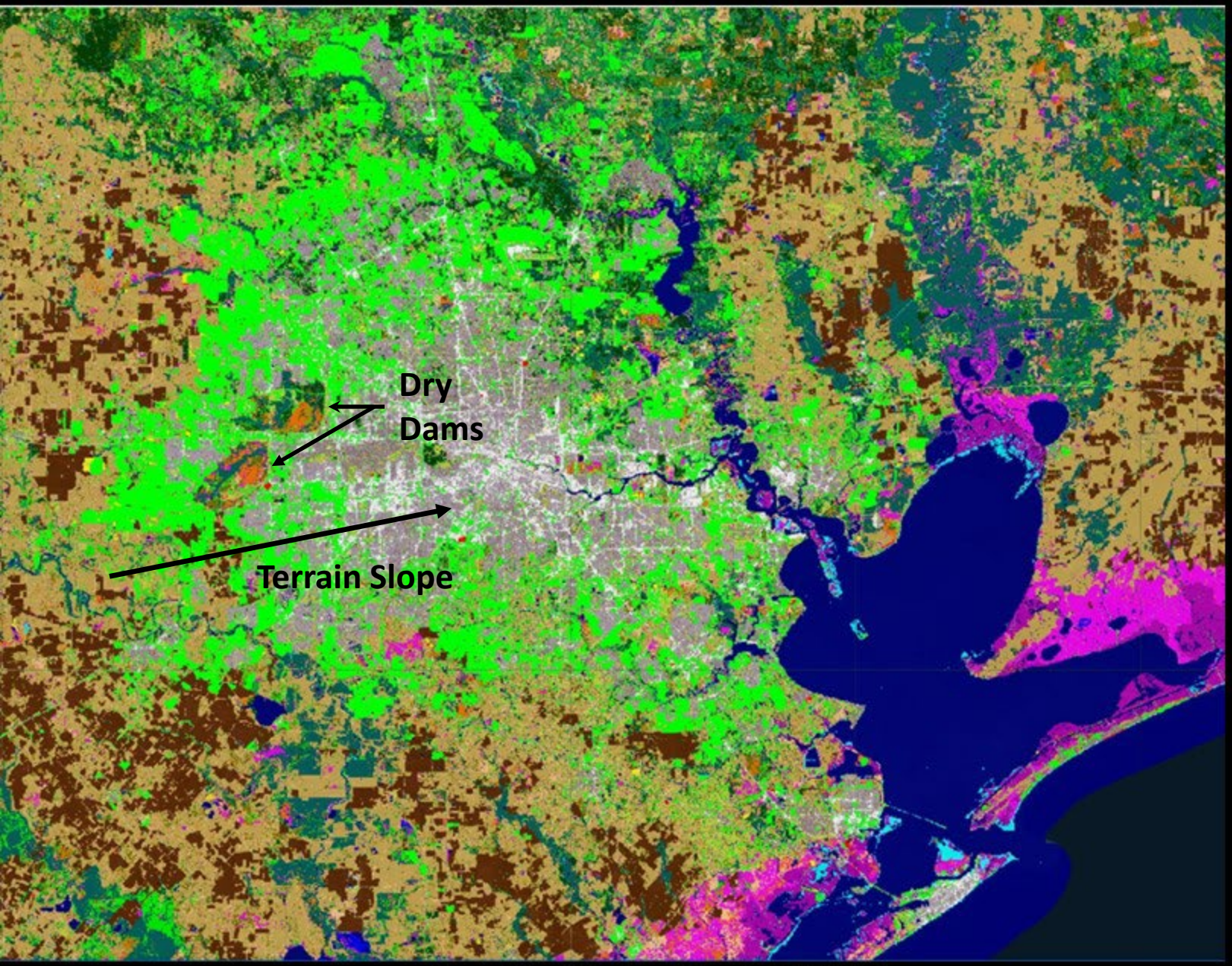
- **JUST** design = whatever you are building/doing make sure that it is built in a systems context and that the results it produces are fair and equitable and in or in keeping with the values of society as a whole.

Which do you want ?



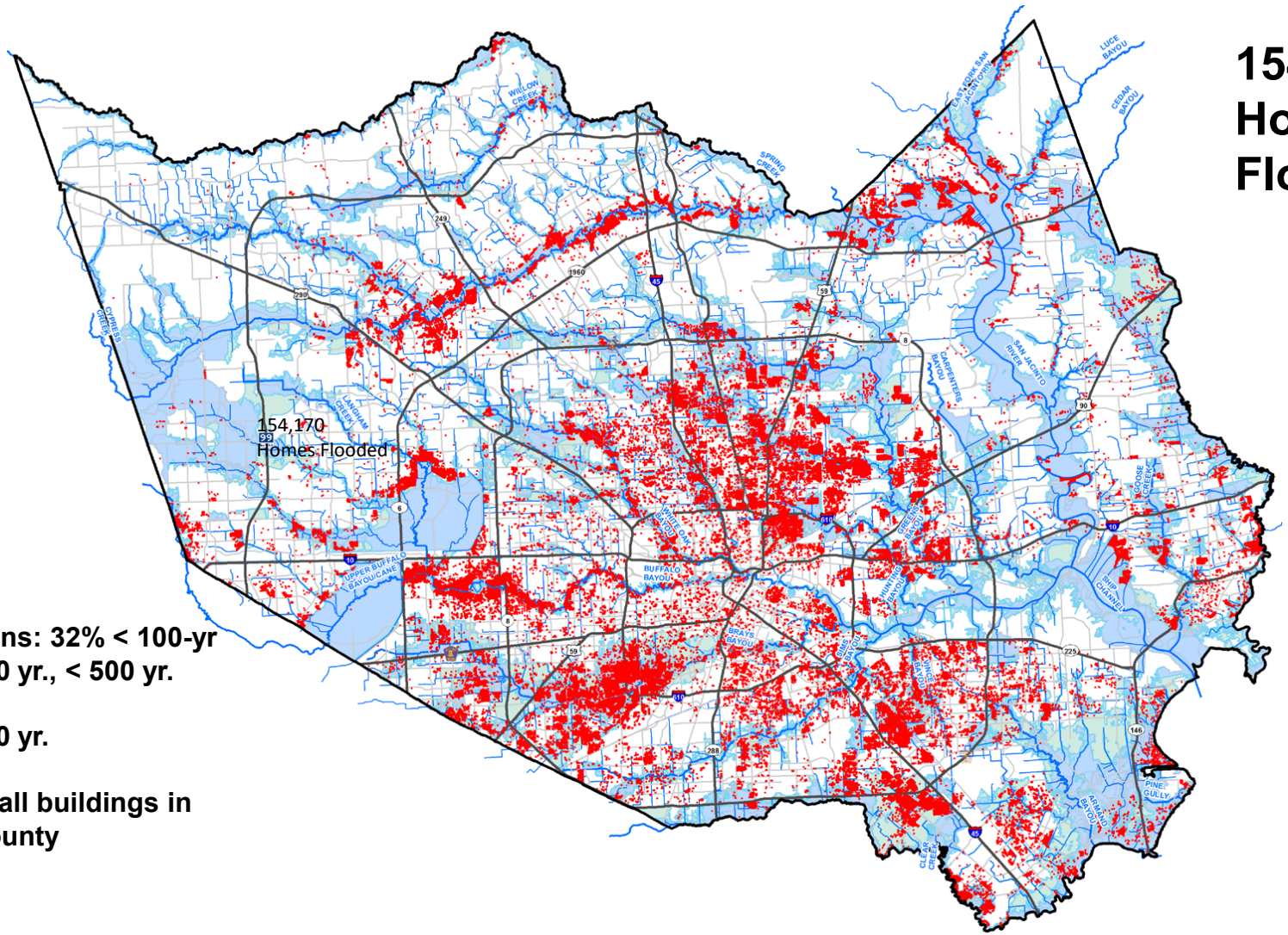
A picture illustrating the concepts of equality, equity and justice. Courtesy of Courtesy Advancing Equity and Inclusion: A Guide for Municipalities, by City for All Women Initiative (CAWI), Ottawa

Houston Area Development Change 1996-2010



Source: *National Oceanic and Atmospheric Administration*

The People Dimension!

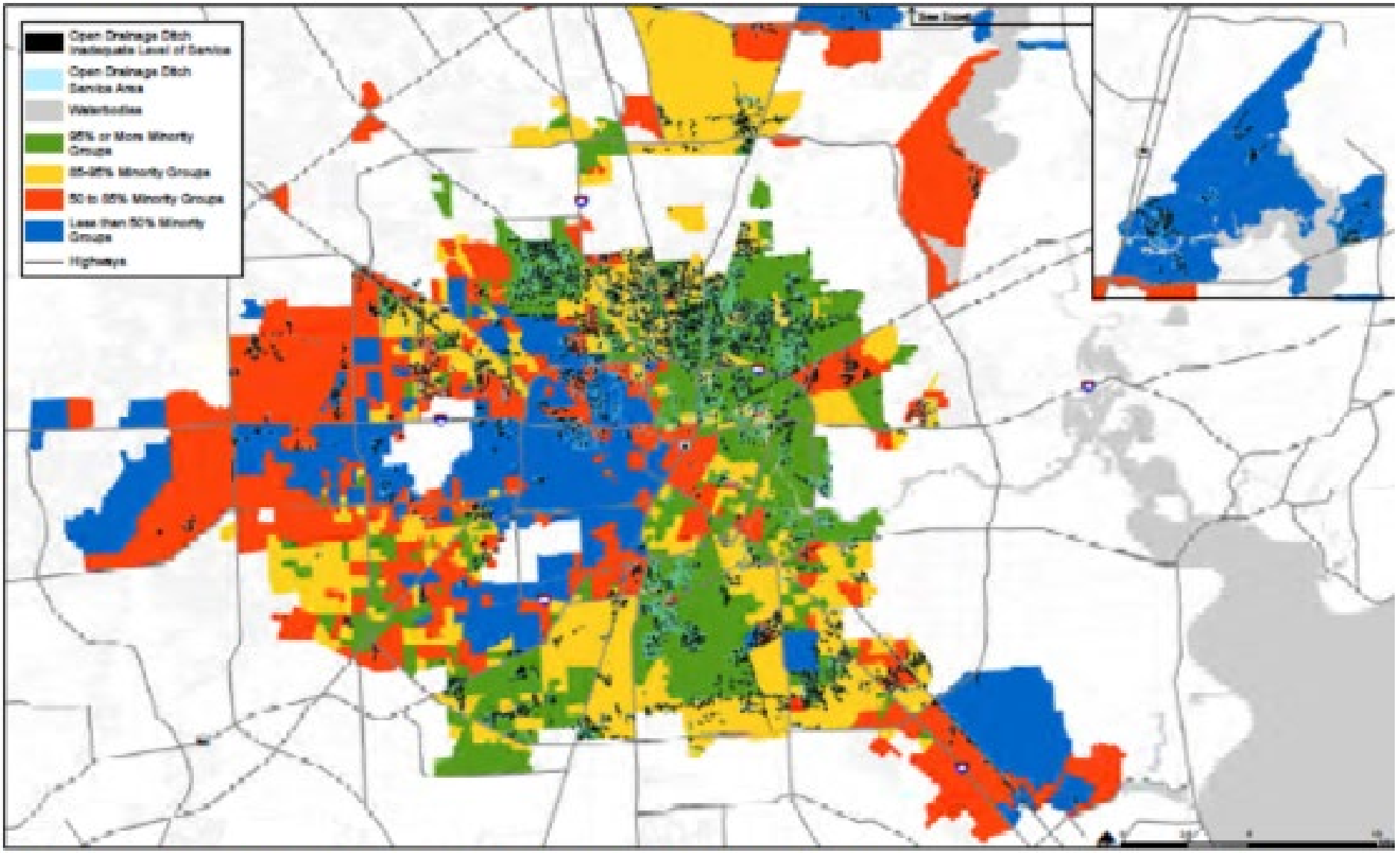


154,170 Homes Flooded

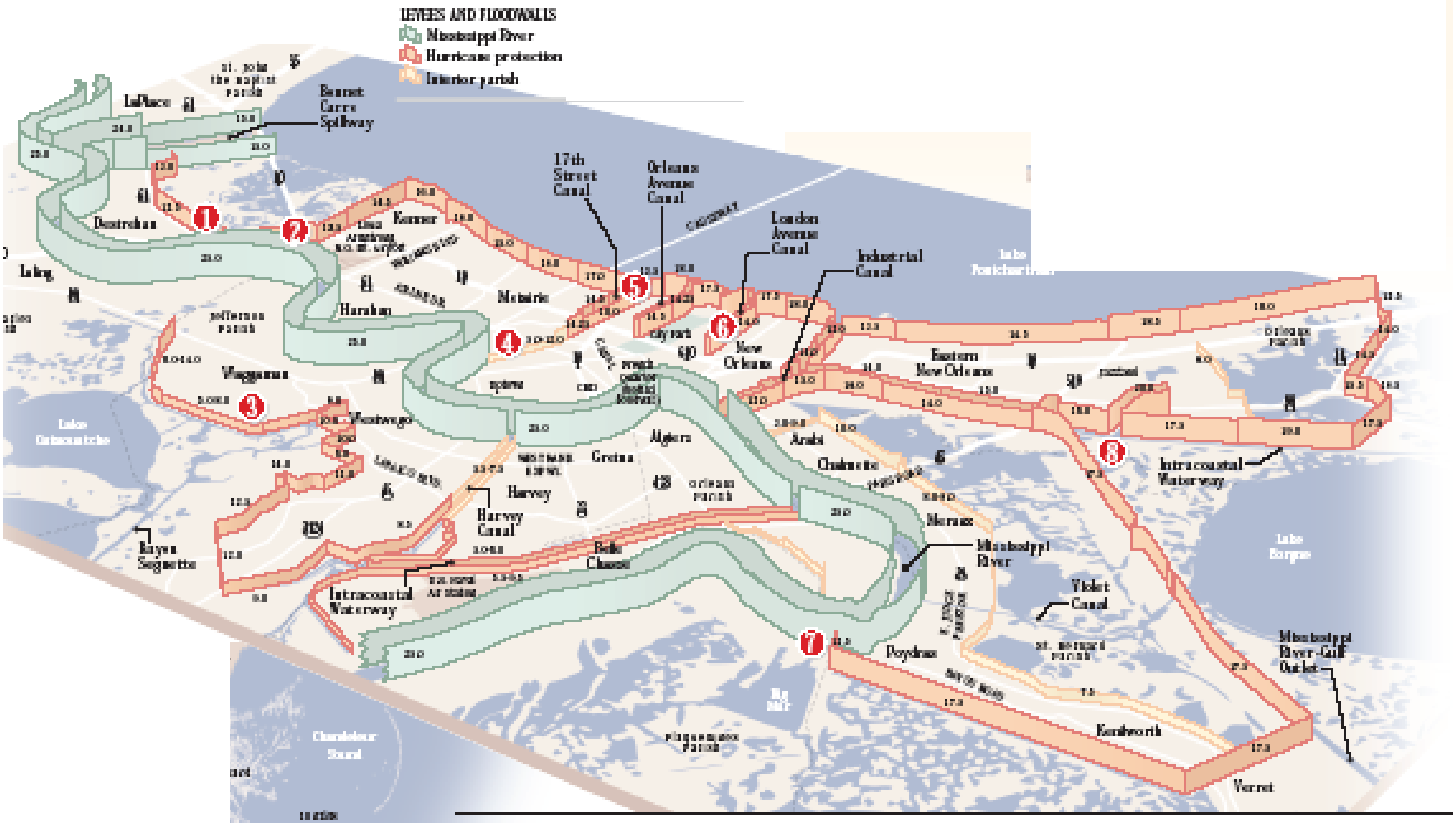
Floodplains: 32% < 100-yr
23% > 100 yr., < 500 yr.

46% > 500 yr.

~ 10% of all buildings in Harris County



Open Drainage Ditch Service Areas in Houston, Texas

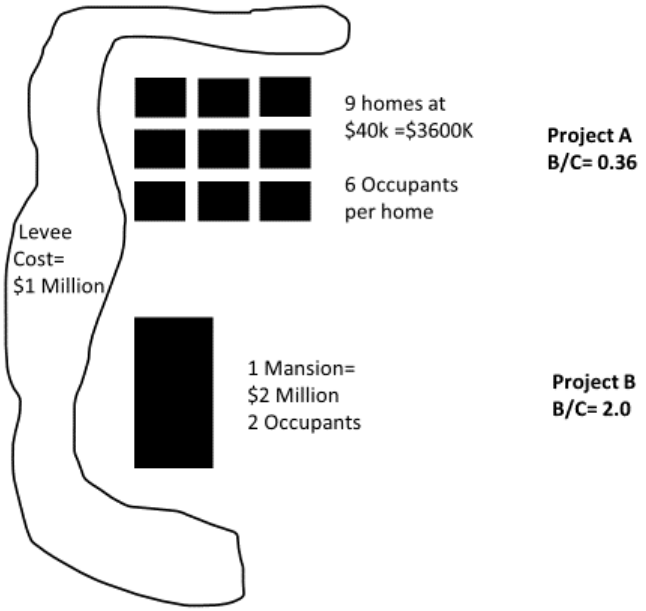

LEVEES AND FLOODWALLS
Mississippi River
Hurricane protection
Interior parish
St. John the Baptist Parish
LaPlace
Bonnet Carre Spillway
Destrehan
Kenner
17th Street Canal
Orleans Avenue Canal
London Avenue Canal
Industrial Canal
Lake Pontchartrain
Metairie
Harahan
Jefferson Parish
Waggaman
Westwego
Lake Cataouatche
New Orleans
Eastern New Orleans
Orleans Parish
Algiers
Gretna
Harvey
Harvey Canal
Arabi
Chalmette
Meraux
Belle Chasse
Bayou Segnette
Intracoastal Waterway
Mississippi River
Violet Canal
Lake Borgne
Mississippi River-Gulf Outlet
Poydras
St. Bernard Parish
Kenilworth
Verret
Plaquemines Parish
Chandeleur Sound

Challenges to Producing Equitable Engineering/Infrastructure Solutions

- **Inclusive Education – Overcoming Tunnel Vision**
  - Who Teaches/Preaches Social Justice/Equity?

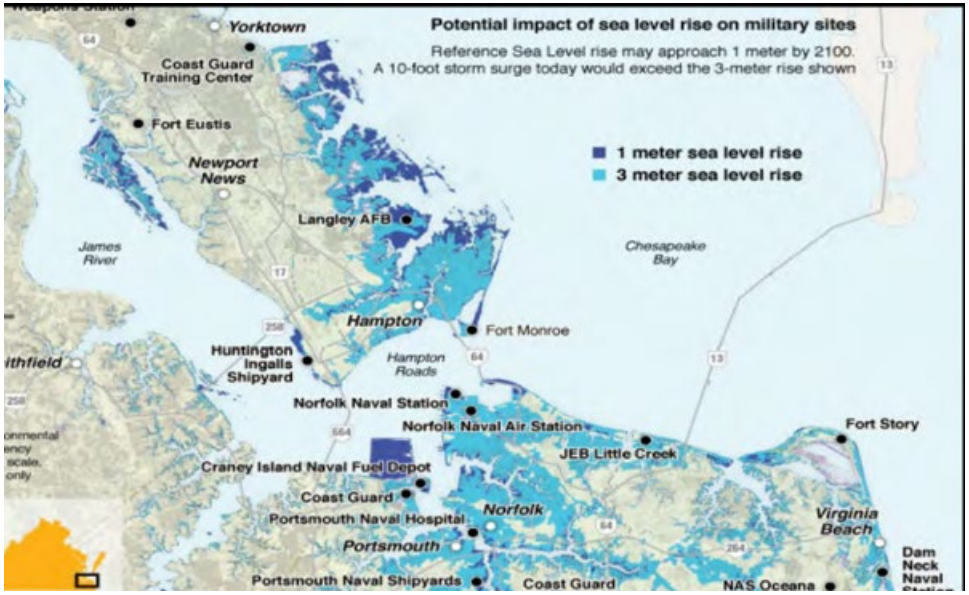
Challenges to Producing Equitable Engineering/Infrastructure Solutions

- **Inclusive Education - Tunnel Vision**
  - Who Teaches/Preaches Social Justice/Equity?
- **Limited Analysis – Single Focus BCA**



Challenges to Producing Just Infrastructure Solutions

- **Inclusive Education - Tunnel Vision**
  - Who Teaches/Preaches Social Justice/Equity?
- Limited Analysis – Single Focus BCA
- 19th Century Governance –Turf –Agencies Working Together



Challenges to Producing Equitable Engineering/Infrastructure Solutions

- **Inclusive Education - Tunnel Vision**
  - Who Teaches/Preaches Social Justice/Equity?
- Limited Analysis – Single Focus BCA
- 19th Century Governance –Turf Agencies Working Together
- Roll-Over – Project vs Holistic/System Solutions

"Policy will only get better when engineers get involved to create holistic solutions."

– Jose Aguilar

BUILDING RECOVERING

Perhaps, now is the time to fully join 21st century holistic infrastructure systems development and Planners, Engineers, Environmentalists, Sociologists, Housers, Developers, Medical Personnel, Scientists

Acknowledgement

The Center for Rural Enterprise and Environmental Justice

SANDY!

29-30 October 2012

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Thank You!

Remember:
Nature Bats Last
VUCA

- Flooding is not fair: the inherent natural differences of the
- landscape, plus the legacy of differential interventions, are the
- causes of some areas being flooded much more frequently than
- others. Every intervention in FRM tends to prioritize one group or
- location over another, creating further inequality and ‘unfairness’.
- Maximizing the utility of an investment, whilst ensuring that it
- is distributed through an equitable process that also protects
- the most vulnerable members of society, raises a number of
- practical problems. Providing protection to one community but
- not another is unfair; providing a higher level of protection to
- one than to another is unfair. However providing a common
- level of protection to all is impossible, and even if achievable
- would be inefficient. The desire to manage flood risk more
- fairly promotes the use of nationally consistent nonstructural
- strategies that are available to all (for example better forecasting,
- improved building codes and grant\compensation schemes).
- Such an approach offers a greater contribution to equality and
- vulnerability-based social justice principles than the status quo
- of providing engineered solutions to the few.

- Philosophers have analysed fairness and ‘social justice’ for centuries. Three social justice models – procedural equality,
- Rawls’s maximin rule (Rawls, 1971) and maximum utility –are the most relevant to FRM and embody the principles
- currently employed in FRM decision-making today (Table 5). In this regard it is important to separate procedural equity
- (‘is everyone treated the same?’) from outcome equity (‘doeseveryone face the same (residual) risk?’). The former is at leastossible and may be realistic. At a national or regional scale the
- latter is naïve and unattainable. At a very local scale it may bepossible but it is generally still difficult to attain.
- In seeking to provide a fair approach, FRM decision-makersaim to address all three of the justice principles: that is, to
- maximize utility while ensuring that investment is distributedthrough an equitable process and that the most vulnerable
- members of society are protected. This requirement raises number of practical problems. To manage flood risk more
- fairly in the future, a move in the direction of governmentfunding of nationally consistent nonstructural strategies that
- are available to all (for example better forecasting, improvedbuilding codes and grant\compensation schemes) offers
- a greater contribution to equality and vulnerability-basedsocial justice principles than the status quo. Simply putting
- most effort into protecting parts of the population (by flooddefence means) is demonstrably unfair, although it may beeffective and efficient.

Justice principle (type)	Rule/criteria	Meaning for FRM	Potential implications for FRM
Equality (procedural)	All citizens to be treated equally	Every citizen should have the equal opportunity to have their flood risk managed	A greater focus on vulnerability reduction and state-sponsored self-help adaptations that can be provided for all – avoiding the inherent unfairness in providing structural solutions that benefit the few
Maximin rule (distributive)	Options chosen to be those that favour the worst-off best	Resources should be targeted to the most vulnerable	Need to identify, and target assistance at, the most vulnerable members of society, even when greater economy returns can be found elsewhere
Maximize utility (distributive)	Options chosen to be those that secure the greatest risk reduction per unit of resource input	Assistance provided to those members of society to which the benefits offer the greatest gain to society	Need to identify a set of measures that deliver the greatest risk reduction for minimum resource. This is likely to be associated with a broad range of measures. The greatest risk reduction, for the most vulnerable, is most likely to be provided in the form of nonstructural responses, for example state-assisted self-help homeowner adaptations and improved preparedness, with more capital-intensive structural solutions provided to areas of high economic activity.