#### The High Cost of Ignoring Life Cycle Issues in Building Design

Gregg Lewis, AIA, LEED AP NRMCA

# "Disaster Losses exceed \$300 Billion (annual average) and growing!"

-UN International Strategy for Disaster Reduction (UN-ISDR), 2015



LESSONS FROM FAILING TO DEVELOP A STRONGER AND SAFER BUILT ENVIRONMENT

ARIS PAPADOPOULOS

#### Billion-Dollar Weather/Climate Disasters 1980-2012 (2012 Dollars)



Source: NOAA 2012

#### Number of Hurricanes and Damage by Decade



#### Number of Hurricanes and Per Capita GDP



#### **Great San Francisco Quake & Fire 1906**



#### Hurricane Katrina 2005



# Stuck in Response mode.

Disaster Relief

# Resilience focuses on local community.

# And less dependence on these guys.

## Or these guys who are in the same boat.

POLICE

# Nature

New York

Disaster is a signal of the failure of a society to adapt to its new environment.

## RESILIENCE

"IN OUR FAST-CHANGING WORLD, LOCAL GOVERNMENT LEADERS IN EVERY REGION AND OF EVERY SIZE, SHAPE, AND CULTURE INCREASINGLY FACE DIFFICULT QUESTIONS OF HOW BEST TO ENSURE A STRONG, SAFE, HEALTHY, PROSPEROUS, AND SUSTAINABLE COMMUNITY. COMMUNITY RESILIENCE IS THE HEART OF THIS CHALLENGE AND THIS OPPORTUNITY."

ROGER PLATT, President, U.S. Green Building Council

Central to Sustainability Avoidance, Enabling, Fortifying Proven Benefits

### How do we Adapt?

- 1. Adopt a Building Code
- 2. Encourage Voluntary "Code Plus" Construction
- 3. Adopt High Performance Building Standards
- 4. Build with Robust Materials



#### 1. Adopt a Building Code

#### Can We Afford to Adopt a Building Code?

ASHRAE study confirms just 17% of a building's total costs over its life are its cost of construction.

#### Can We Afford NOT to Adopt a Building Code?

Houses built under the new code still wouldn't have held up to a direct hit from an EF5 tornado like the one that devastated the city May 20, Mayor Glenn Lewis said. But the changes could save structures and lives in a less powerful storm, he said.

#### When did buildings become disposable?

#### When did buildings become disposable?

Not all of the structures we fight fires in today are lightweight but what are the

consequences of fighting fires in lightweight construction deploying traditional techniques? Injury or death / not every time but the RISK is increased ten-fold to the firefighter. Buildings are disposable. Buildings will be rebuilt with the assistance of insurance coverage or an empty lot will remain for many years into the future. I was having this kind of conversation with a South Bend IN firefighter one day and he said; "let me take you around the city and I



can show you empty lots that have been empty for more than 10 years because there was a building and it caught on fire". Either the building owner did not have adequate insurance or took the insurance money and did something else with it. His point was that the crews took risk for what – whatever was saved was bulldozed in and an empty lot remained 10 or more years later.

#### Buildings are disposable – Firefighters Are Not!

By Chief John Buckman





#### Safe Houses Save Lives Too

#### How well do you sleep at night?

"The Edgewater inferno makes it clear that we need new and improved building standards in New Jersey in order to protect residents and first responders," said Scott Rumana (R- Passaic, Bergen, Essex and Morris). "The lightweight wood construction used to build the Edgewater complex is the reason the fire raced through the luxury apartment development so quickly."

# **Drury Hotels Builds with Concrete for Quality and Long Term Value**

#### International Residential Code Statewide Adoptions





2. Voluntary "Code Plus" Construction

## **FORTIFIED® Building Programs**

- Hurricanes
- Tornadoes
- Earthquakes
- Floods
- Wildfires
- Severe winter weather





#### **Steps 1: Risk Assessment**



#### www.disastersafety.org

#### **Steps 2: Design**





#### **Step 3: Compliance**

- Four inspections:
  - Foundation
  - Roof Deck
  - Pre-drywall
  - Final



#### **Designation Certificate**



This designates that the residence located at

#### XXX Hurricane Alley Winter Haven, FL 33884

satisfied the Institute for Business & Home Safety's Fortified...for safer living® program requirements as of January 5, 2011.









FFSL #YYY

Remington Brown IBHS Sr. Engineering Manager FORTIFIED for Safer Living<sup>®</sup> Homes Pre-Hurricane Ike Bolivar Peninsula, Texas

> FORTIFIED for Safer Living<sup>®</sup> Homes Post-Hurricane Ike Bolivar Peninsula, Texas





#### **3. High Performance Building Standards**

#### **High Performance Building Standards**



#### = Improved Community Resilience

## High Performance Criteria



#### 4. Build with Robust Materials

#### **Robust Building Materials...**

- Versatile
- Strong
- Water Resistance
- Non-combustible
- Energy Efficient
- Durable



## ...Built to last



#### **Case Studies**









#### **Additional Cost of Fortified Construction**

#### **Estimate of Cost of FORTIFIED**

#### +3 to 10 percent to hard costs

Typical code construction

90 mph wind



FORTIFIED construction

110 mph wind



#### **Benefits of Natural Hazard Mitigation**

## Reduction



...every dollar spent on mitigation saved four dollars in avoided future losses.

- Property damage
- Business disruption
- Environmental damage
- Deaths, injuries and homelessness
- Cost of emergency response (ambulance and fire service)

## Conclusion

- Communities play a major role in resilience
- Voluntary programs (FORTIFIED) are valuable
- Most effective method is to change model building codes at the national level
- Build with more robust building material

 Disasters are inevitable, but their consequences need not be catastrophic with thoughtful design and planning

## **Questions?**

