The Intersection of Critical Infrastructure and Emergency Management

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The international community faces a series of disasters each year that *causes thousands of deaths*

and

costs billions of dollars

in recovery aid, disruption of commerce, and destruction of homes and critical infrastructure.

INTRODUCTION

Risk to disasters is increasing

Population growth will inherently result in an increase in places prone to disasters

Nexus between safety and sociocultural respect presents a variety of administrative challenges

It is the essential role of government to manage focusing events

Emergency management is the discipline of avoiding risks to hazards and dealing with both natural and manmade disasters in an effort to lessen their impact

- Began in 1980s
- Rooted in public administration
- Process orientation of developing policies
- Cycle-based framework
- Academic field and community of practice

A BRIEF HISTORY

Piecemeal approach
- Existed since early 1800s
- Rampant fires spread across New Hampshire
- 7th Congress pass number of relief measures

Broader stance began in the 1930s
- Onset of the Great Depression
- Reconstruction Finance Corporation to stimulate economic activity

Independent agency
- Between 1960 and 1978 disaster relief was created by the Federal Disaster Assistance Administration

Cabinet level position
- Executive Order 12148 by President Carter established the Federal Management Administration

CURRENT STATE

Independent agency
- Reversal of attention back on civil defense through the establishment of Department of Homeland Security in 2002
- Merged 22 agencies into a single department
- Focus on federal response and recovery measures

Administration is determined *ACTION* taken in pursuit of a conscious *PURPOSE*. It is the systematic *ORDERING* of affairs and the calculated *USE* of resources aimed at making those happen which one wants to happen.

~Karl Marx


EVENT INDEPENDENT
MITIGATE
PREPARE
EMERGENCY
MANAGEMENT
DOMAIN
RECOVER
RESPOND
EVENT DRIVEN PHASES

1. Mitigation

Preventing future emergencies or minimizing their effects

2. Preparedness

Preparing to handle an emergency

3. Response

Responding safely to an emergency

4. Recovery

Recovering from an emergency

CONCEPTUALIZING DISASTERS

DISASTER – a deadly, destructive, and disruptive **event** that occurs when a hazard interacts with human vulnerability

HAZARD – **source** of danger that poses a threat to life, health, property, or the environment

RISK – the **susceptibility** to death, injury, damage, destruction, disruption, stoppage, etc.

VULNERABILITY – **proneness** of people to hazards and risk based on varying factors as demographics and location, etc.

DETECTING HAZARDS

Process of identifying what hazard is about to occur, or what disaster has just taken place

Each is different and requires various methods of detection

- Senses, field feedback, dispatch, radio traffic, news, volunteers, meteorological/geological services, incident networks, hospitals, technology, etc.

Initial measures for detection center on the six serving men

- WWWWH

NATURAL HAZARDS

-Rooted in natural environment

-Considered acts of God

-Not preventable

-Associated with perceived ***lack of control***

HUMAN-INDUCED HAZARDS

-Caused by humans

-Result of human intent, negligence, error, or system failure

-Not predicted, thought to be preventable

-Identifiable parties to be held accountable

-Associated with perceived ***loss of control***

DISASTER TERMINOLOGY

Emergency – an unforeseen event that calls for immediate intervention and urgent care to prevent the continued risk to life, health, property, or the environment

Crisis – an abrupt event in which the turning point for a situation may become unstable and occur with little or no warning, negatively affecting an individual, group, community, or society

Calamity – an event of great misfortune in which a situation is seriously marked by great loss and lasting distress and suffering

Catastrophe – a violent and destructive event ranging from extreme misfortune to utter overthrow or ruin

RUN GOOGLE ANALYTICS VIEWER

FRAMING DISASTERS TODAY

Disasters are socially constructed phenomena

Consequences of disasters are often broad-based, long-term, and unanticipated

Examining the connection between social capital and political trust is paramount:

- Political trust is vulnerable
- Social capital can be weakened
- Remediation strategies have consequences

PLACE MATTERS

Place is part of human identity

Society is characterized by shared experiences

Tradition is not the only source of values

Social and political action takes place within shared histories

ISSUE IDENTIFICATION

The extent of social beliefs, political attitudes, and economic perspectives vary

Ideologies differ among a range of issues

Characterizing issues is a critical factor in defining problems

DETERMINING VULNERABILITY

Geographic location
- Country, state, city

Demographic factors
- Race, gender, age, education, income, etc.

Other factors
- Growing population
- Persistent poverty
- Drawn urbanization
- Increased diversity
- Enhanced globalization
- Further industrialization
- Improper land use and inadequate construction
- Expanding sense of entitlement

EVEN MORE VULNERABILITY

Weak emergency management

Humans are dependent upon the climate they live in

Changes in global average temperature have always occurred

Impacts natural environment as a vicious cycle

Caused by several factors:

- Plate tectonics (millions of years)
- Orbital fluctuations (hundreds of thousands of years)
- Milankovitch theory are cycles as based on eccentricity, tilt, and procession
- Atmospheric variations (any time)

HIGH THREAT PARADIGM

Threats are no longer normal and static

Assailants are engaging in *entrepreneur-like* activities with the support of technology

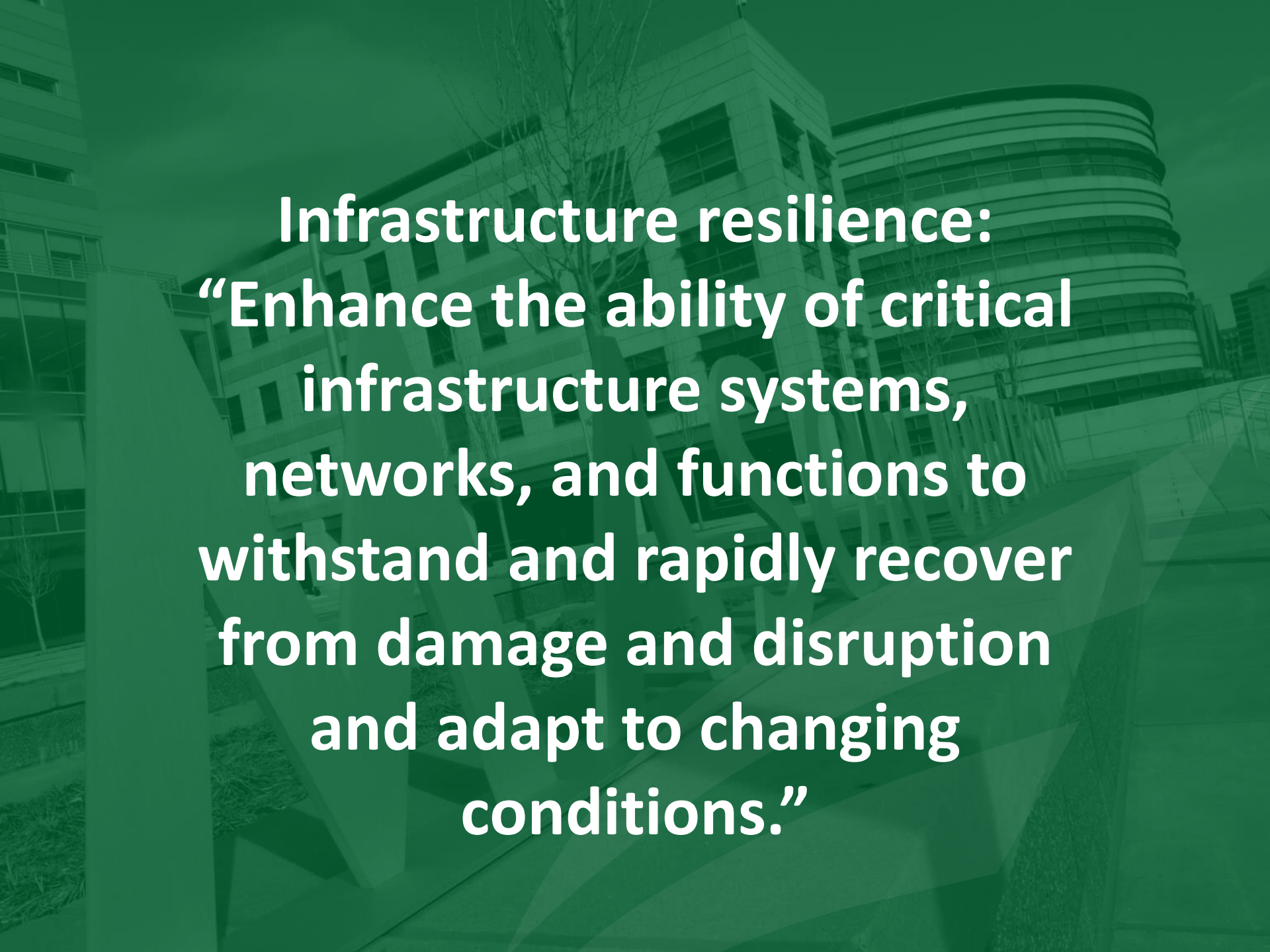
There is no longer a *lack of imagination* but, instead, a *lack of adaptability*

SO WHAT IS A HIGH THREAT

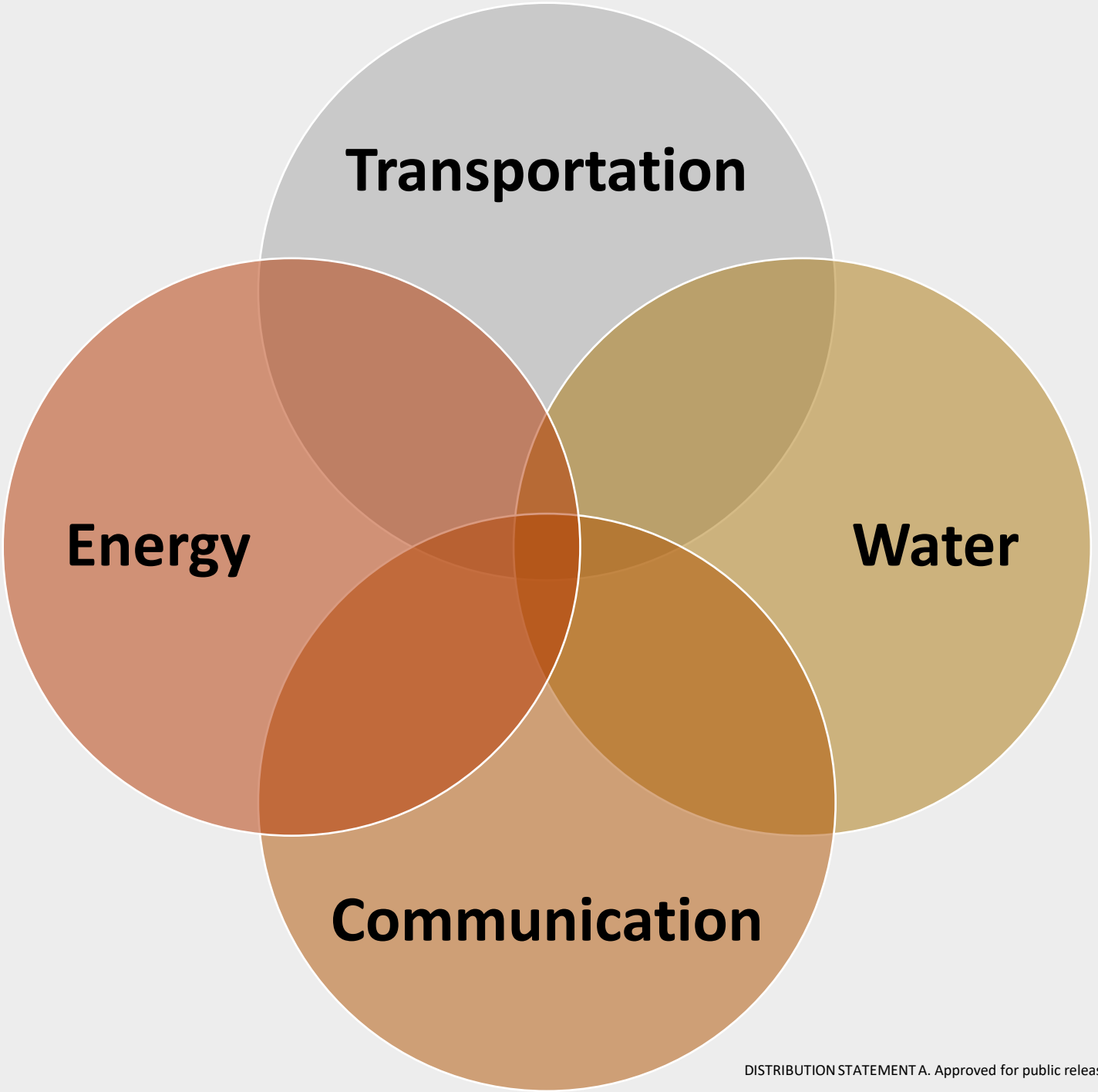
Atypical emergencies and complex attacks include active shooters, riot violence, marauding, etc.

Complex attacks differ due to the lack of any indication of a long term planning process or prior preparation

Key difference is that a coordinated attack requires the indication of insurgent long term planning



Infrastructure resilience:
"Enhance the ability of critical infrastructure systems, networks, and functions to withstand and rapidly recover from damage and disruption and adapt to changing conditions."



ENERGY SYSTEMS

Sustainable and resilient energy grids (electric and pipelines) critical

Energy production and distribution systems owned by private sector

Public/private sector cooperation necessary for disaster response planning and anticipating future challenges of integrating decentralized power into existing infrastructure

Understanding “codependent” infrastructure networks important

WATER SYSTEMS

Water is one of the most important “codependent” networks

Restoration of powers to water pumping facilities critical

Climate change causing either water shortages or flooding

Meeting these water-related challenges involves both public-private partnerships and community engagement

TRANSPORTATION SYSTEMS

Transportation (and communications) systems depend on reliable energy infrastructure to function after a disaster

Without power, fuel pumps do not work to keep people and goods moving

As electric vehicles (EVs) become more important, restoring electric power for charging EVS

Looking further ahead, EVs may become secondary storage for increasingly decentralized electric power distribution grids

COMMUNICATION SYSTEMS

Increasingly complex (and integrated) communications systems heightened importance of robust cybersecurity policy

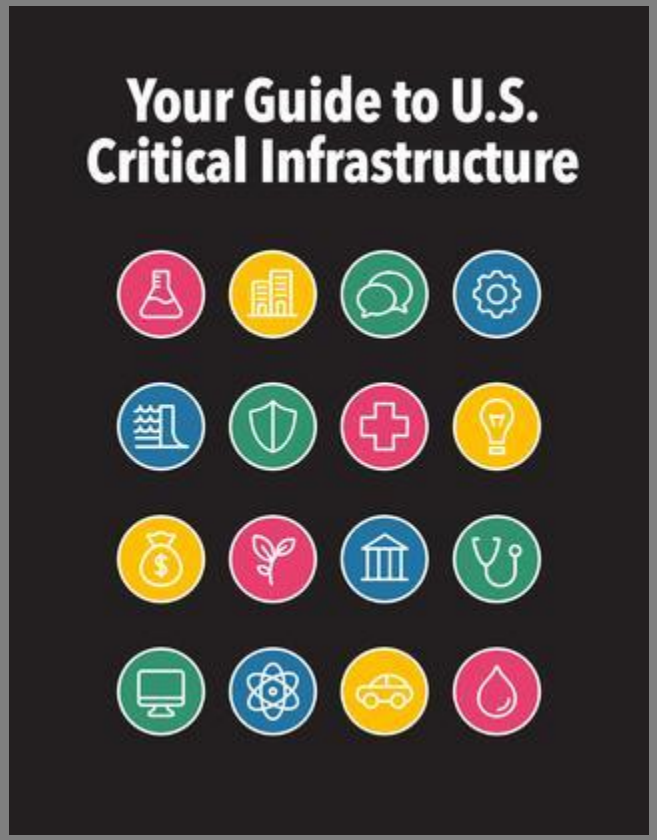
As energy grids decentralize and require functioning communications systems, an integrated response is necessary for enhanced resilience and sustainability

The pace of technology change in the communications sector has outstripped the ability of policy makers and power grid operators to understand vulnerabilities and effectively respond to disasters

NEXUS BEWTEEN CRITICAL SYSTEMS

Continuity Planning for Critical Infrastructure

Financial and Political Risks to Critical Infrastructure Resilience



IMPLICATIONS OF CRTICAL INFRASTRUCTURE FOR EMRGENCY MANAGEMENT

There are long-term trends and drivers in critical infrastructure which have implications for emergency management

--Aggressiveness with which infrastructure construction is pursued

--Whether the public or private sector is expected to fund infrastructure

--Continuing to rely on large, centralized infrastructure projects or moves toward developing smaller-scale projects

--The incorporation of technology into physical infrastructure

--The government's role in providing and securing information infrastructure

CONNECTION OF CIP TO EMERGENCY MANGEMENT

Emergency managers will be greatly affected by how the nation approaches infrastructure over the next few decades

--Aging or failing infrastructure

--Poor land use planning

--Reliance on information networks

DIFFICULTIES REMAIN

-Crisis-reactive approach

-Hazard zone attraction

-Fragmented systems perspective

DECISION REMEDIES

-Designing preferable models such as the 3C's

-Situational awareness

-Think critically

-Try to return to a period of normalcy as quickly as possible

GLOBAL CHALLENGES

Disasters occur within a limited geography

Traditional crisis models have typically focused on post-crisis response

Policymakers are ill equipped to handle many of the social, environmental, and economic elements

If communal networks are disrupted, there will be a lasting impact on the community

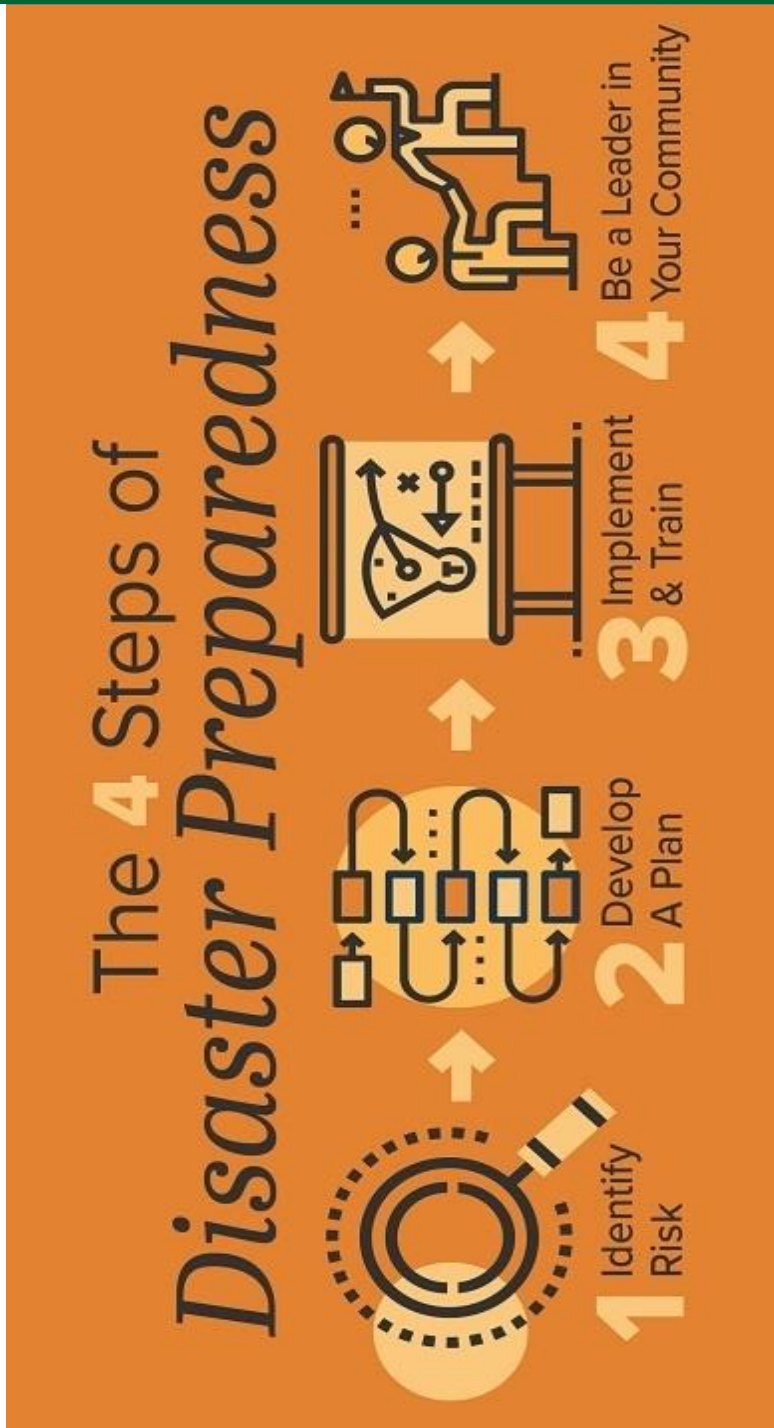
LOCAL SOLUTIONS

Understanding disaster meaning is essential to problem-solving

Increased communication and enhanced cooperation should be viewed as a relevant means to ideological bridge building

Decision-making models have highlighted a need for collaborative partnerships

A framework for emergency operations should be developed in an integrated manner



A New Framework

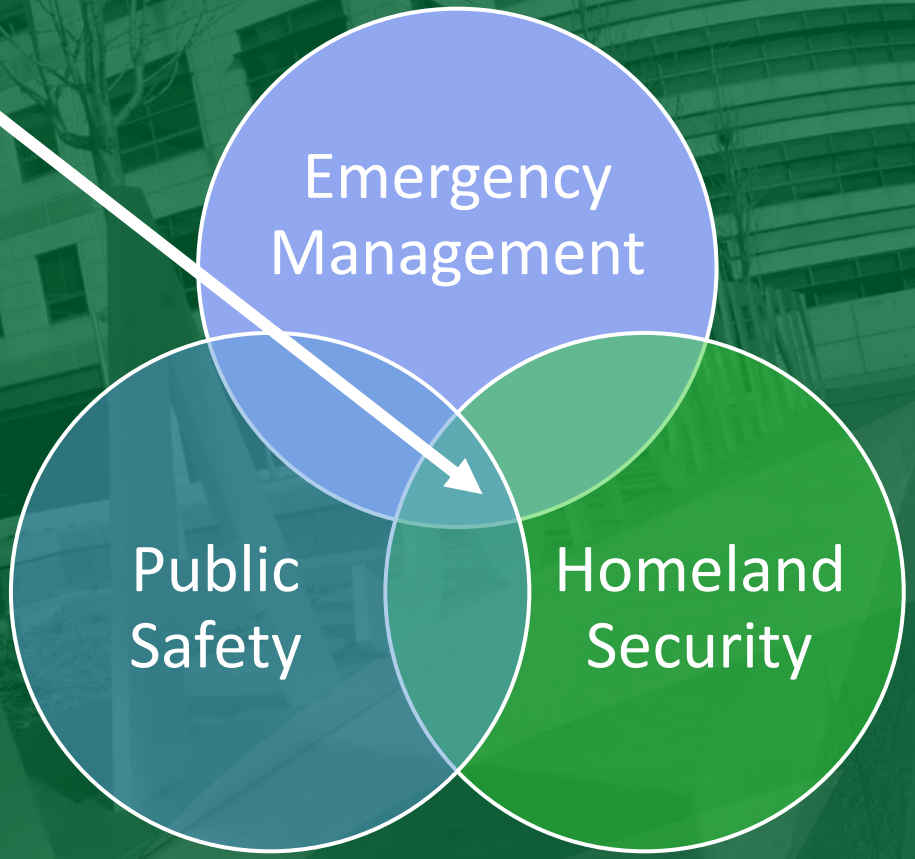
An Integrated Approach to Resiliency and Sustainability

(*utilization of the 3 C's*)

Increased **Communication**

Enhanced **Coordination**

Meaningful **Collaboration**



Future Prescriptions

It has become important for decision-makers to ask/answer questions of *why*, *where*, and *why there*

Policymakers have attempted to reduce the impacts associated with disasters by *anticipating the unexpected*

Given the *limited opportunities* for crisis-related experience, decision-making, mental models, and situational awareness research on crises have highlighted a further need for effective emergency management

Local authorities are becoming the *force multipliers* for state and federal officials in addressing new hazards and threats

THANK YOU & QUESTIONS

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