

Critical Infrastructure Resilience

Through Communication, Coordination, and Collaboration



PRESENTED BY:

Dr. Tonya E. Thornton (Neaves)
Amb. (ret.) Richard D. Kauzlarich

George Mason University ~ Schar School of Policy and Government

MODERATED BY:
Steve Redifer

2020-02-26



DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

HDIAC is sponsored by the Defense Technical Information Center (DTIC). Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Defense Technical Information Center.

info@hdiac.org
<https://www.hdiac.org>

Critical Infrastructure Resilience: *Through Communication, Coordination, and Collaboration*

Dr. Tonya E. Thornton (Neaves)

Amb. (ret.) Richard D. Kauzlarich

**Homeland Defense and Security
Information Analysis Center**

CIP Webinar

February 26, 2020



Centers on the Public Service

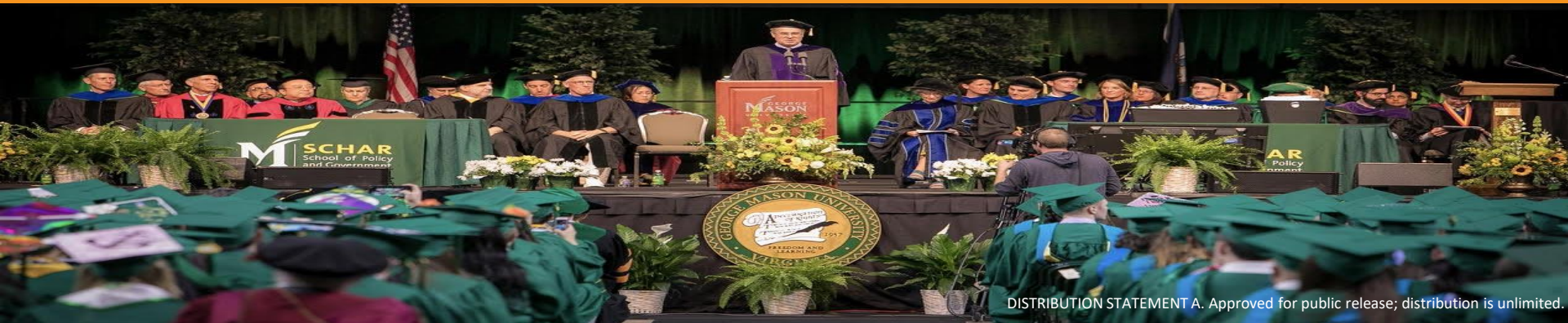
Director: Tonya Neaves

Mission: Drawing upon the mission of the Schar School of Policy and Government and its Master of Public Administration Program, the Centers assists the public sector in addressing emerging challenges that are unprecedented in both scope and complexity.

Center for Energy Science and Policy

Co-Directors: Richard Kauzlarich and Paul Houser

Mission: To build a vibrant interdisciplinary energy science and policy hub that develops integrative applied science and policy solutions for the energy security, sustainability and resilience challenges of Virginia and beyond.



Center for Resilient and Sustainable Communities

Established in 2019

Its vision is that communities world-wide can create life-changing social and economic opportunities through locally led, bottom-up resilience and sustainability initiatives supported by cross-cutting approaches and effective, replicable models.

Builds on Mason's Community Resiliency Lab

Oversees two major and complimentary initiatives: Collaborative Community Resilience and STARTides

OVERVIEW OF CRITICAL INFRASTRUCTURE

Critical infrastructure supports lifeline systems that are considered essential to the successful functioning of governance and society

The efficient delivery of government services relies on a functioning power grid, an operational communication network, an efficient transportation system, and clean water infrastructure, all toward ensuring national security

The capacity and equity of these systems are pressing problems for all sectors

This webinar focuses on the role of communication, coordination, and collaboration for critical infrastructure resilience, recognizing the increasing importance of multi-stakeholder partnerships

AGENDA

- I. Introduction – The Role of Sector Partnerships
- II. Identifying the Critical Systems
- III. Nexus between Critical Systems
- IV. Conclusion – Community Resilience and Sustainability

CRITICAL INFRASTRUCTURE PROTECTION PROGRAM

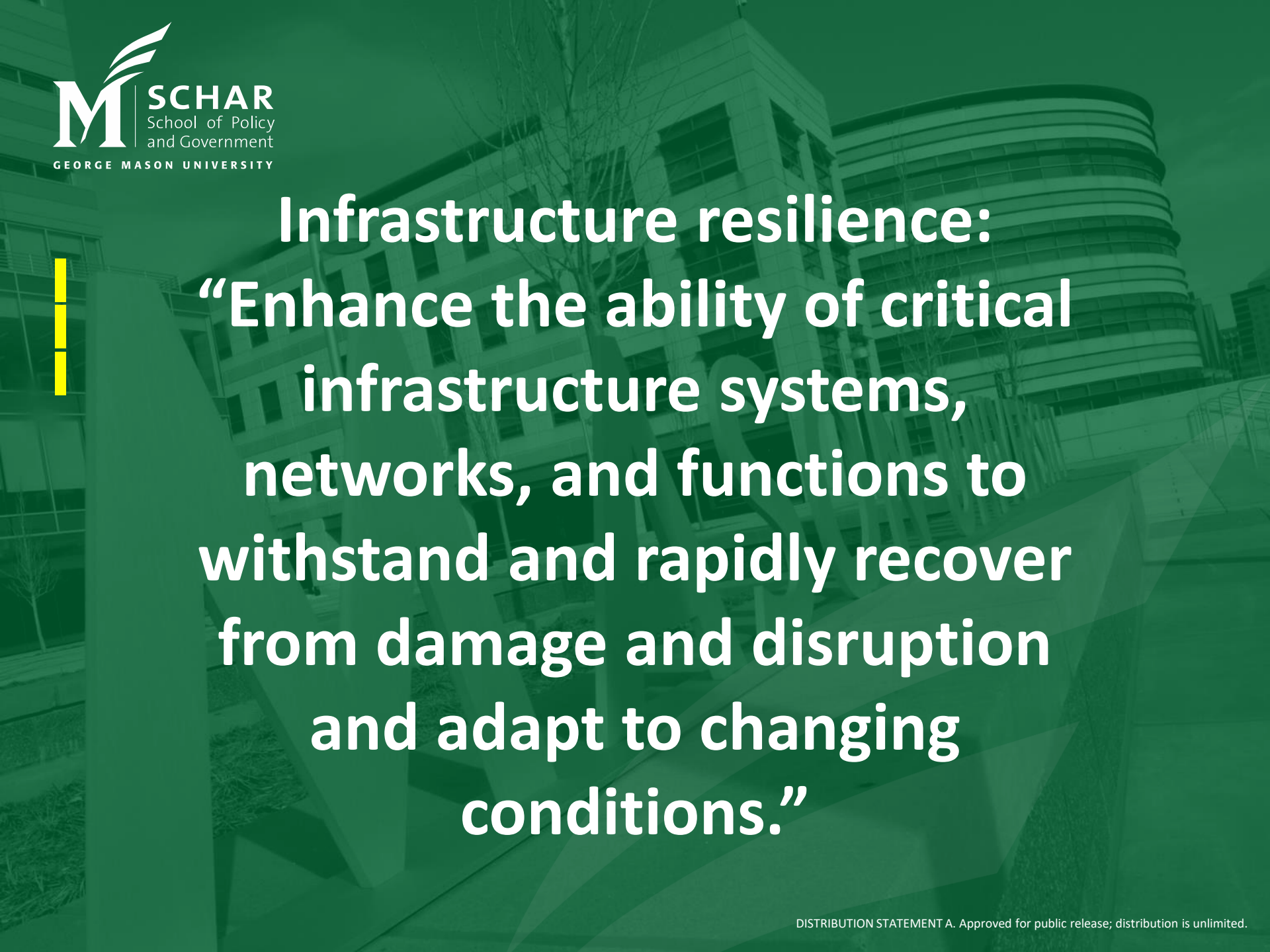
Systems are vulnerable

Critical infrastructure is considered essential to the successful functioning of governance and society

Since 1996, the US has had a wide-reaching Critical Infrastructure Plan Program

The National Infrastructure Protection Plan established 16 critical infrastructure sectors

No coherent definition of system resiliency



**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.”**

INTRODUCTION – ROLES OF PUBLIC-PRIVATE SECTOR PARTNERSHIPS

Key Questions:

1. What does resilience mean to public-private partnerships?
2. How do public-private partnerships influence more durable approaches to critical infrastructure?
3. How can public-private partnerships increase interaction between private operators and state/local authorities?
4. What measurable benefits do government and business leaders gain from public-private partnerships, especially in the DMV?

INTRODUCTION – ROLES OF ACADEMIC-POLICY SECTOR PARTNERSHIPS

Key Questions:

1. Where do universities fit in with partnerships?
2. How can universities work together to develop appropriate resilience training opportunities?
3. Should international relations programs address resilience issues more directly in the context of state and institution building?
4. What is the role of academic and policy partnerships in preparing students and the workforce that impact resilience?

BUILDING PUBLIC-PRIVATE PARTNERSHIPS

They match resilience towards identifying and prioritizing actions to ensure continuity of essential functions and services

Permit partners to identify innovative ways in managing risk through advance research and development solutions

Permit insights for multi-year priorities through shared information

Reflect joint priorities and provide guidance for emergency plans

Leverage trusted relationships and develop expanded networks

USE OF THE ACADEMIES

Major role has been updating curricula through information and communication technologies and incentivize cybersecurity investments

Can enhance model capabilities:

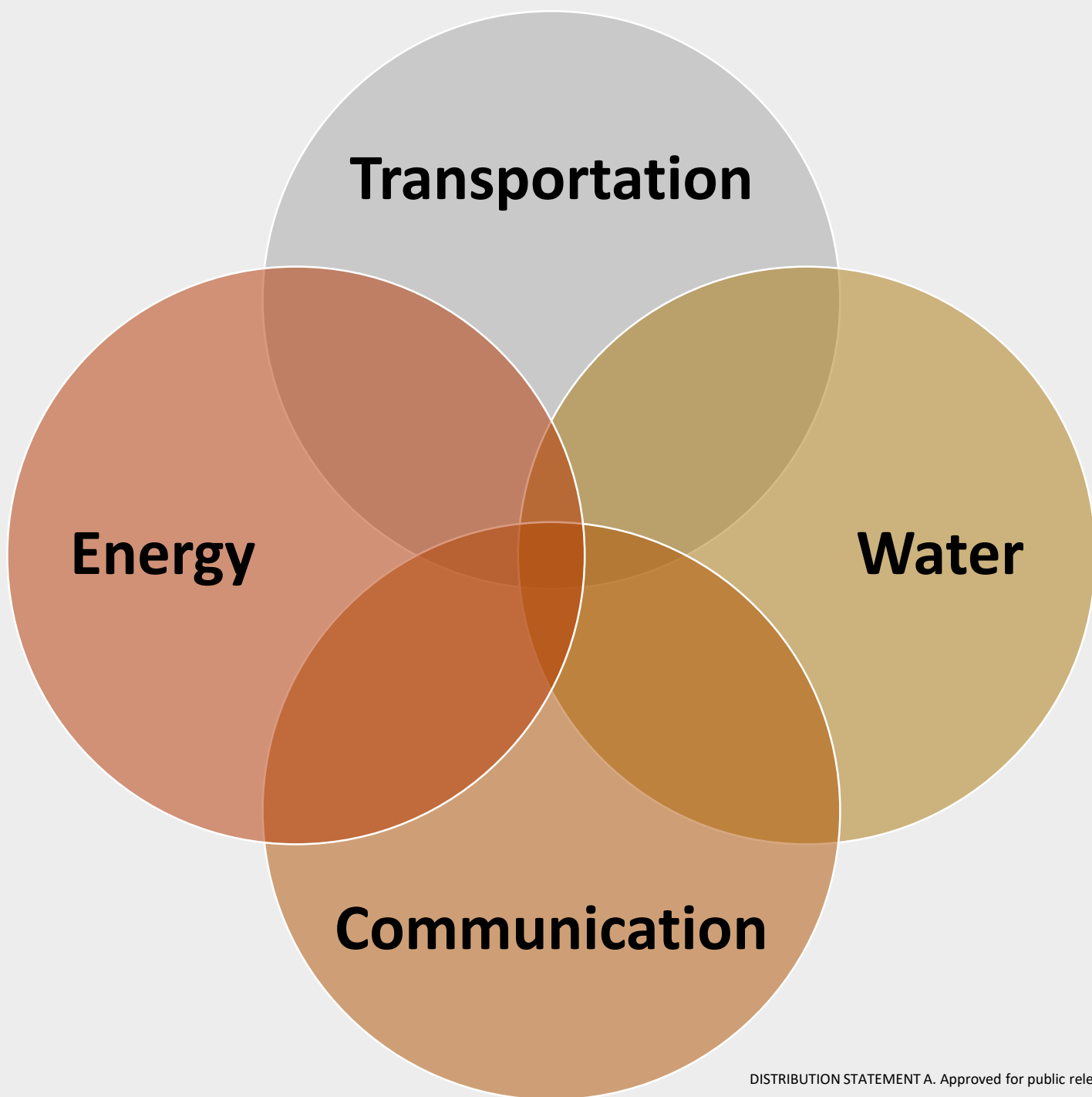
- Address analytic and policy capability gaps

- Develop collaborative exercises

- Test corrective actions

- Evaluate transition from steady state to incident response

- Share lessons learned and corrective actions



Transportation

Energy

Water

Communication

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 BETWEEN CRITICAL SYSTEMS

Continuity Planning for Critical
Infrastructure

Financial and Political Risks to
Critical Infrastructure Resilience

Your Guide to U.S. Critical Infrastructure





The national community faces a series of disasters each year that causes hundreds of deaths and costs billions of dollars in recovery aid, disruption of commerce, and destruction of homes and critical infrastructure.

FRAMING 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



NATURAL HAZARDS

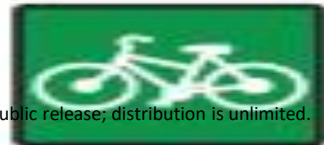
- Rooted in natural environment
- Considered acts of God
- Not preventable
- Associated with perceived ***lack of control***

MAN-MADE 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***



**ARE YOU
PREPARED?**



HIGH THREAT PARADIGM

Threats are no longer normal and static

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

Atypical emergencies and complex attacks

Complex attacks differ due to the lack of any long-term planning

There is no longer a *lack of imagination* but now a *lack of adaptability*

RISK TO DISASTERS

Risk to disasters is increasing

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

It is the essential role of government to manage focusing events

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

CONCEPTUALIZING DISASTERS FURTHER

Disasters are socially constructed phenomena

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

Understanding risks associated with societal problems is the basis for analyzing risk/vulnerabilities and deterring/mitigating unwanted actions/events

Examining the connection between social capital and political trust is paramount

ADDED COMPLEXITY

Hazards are not mutually exclusive

Hazards have many agents

Human vulnerability tends to exacerbate impacts

Weak emergency management still exists

Expanding sense of entitlement

Each must be assessed in terms of risk and probability associated with each hazard

IMPLICATIONS OF CRITICAL INFRASTRUCTURE FOR EMERGENCY 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

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



Be prepared!



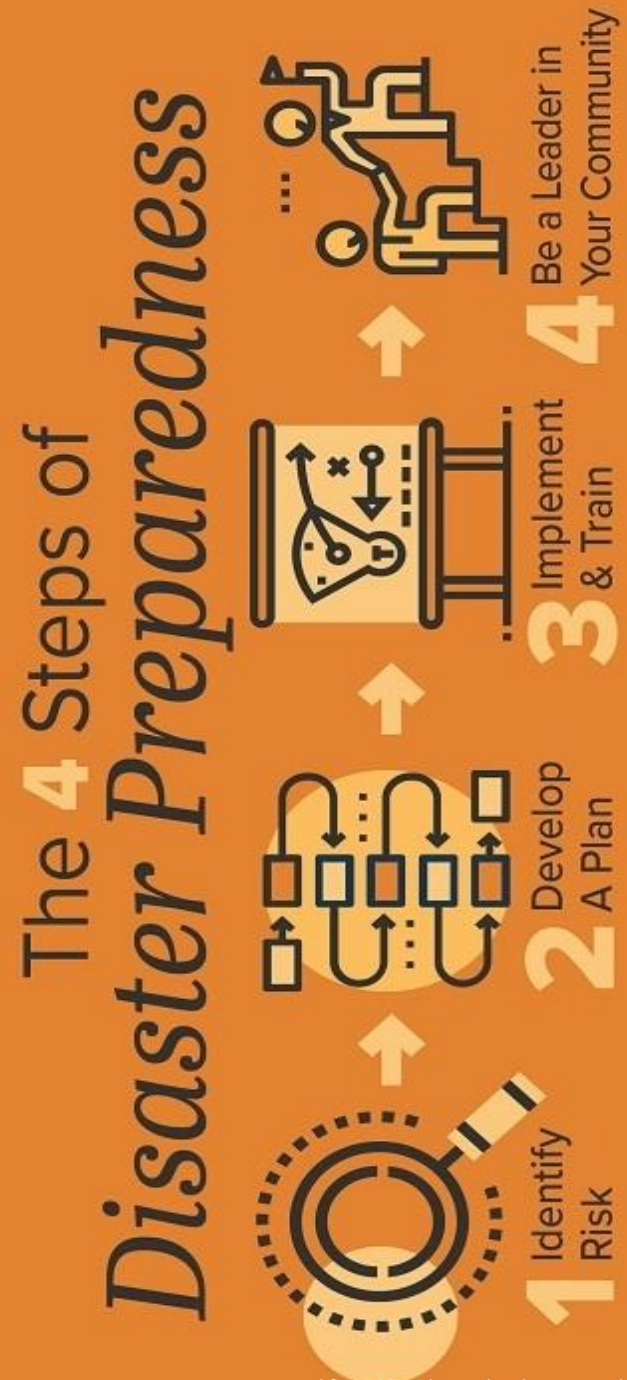
LOCAL SOLUTIONS

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

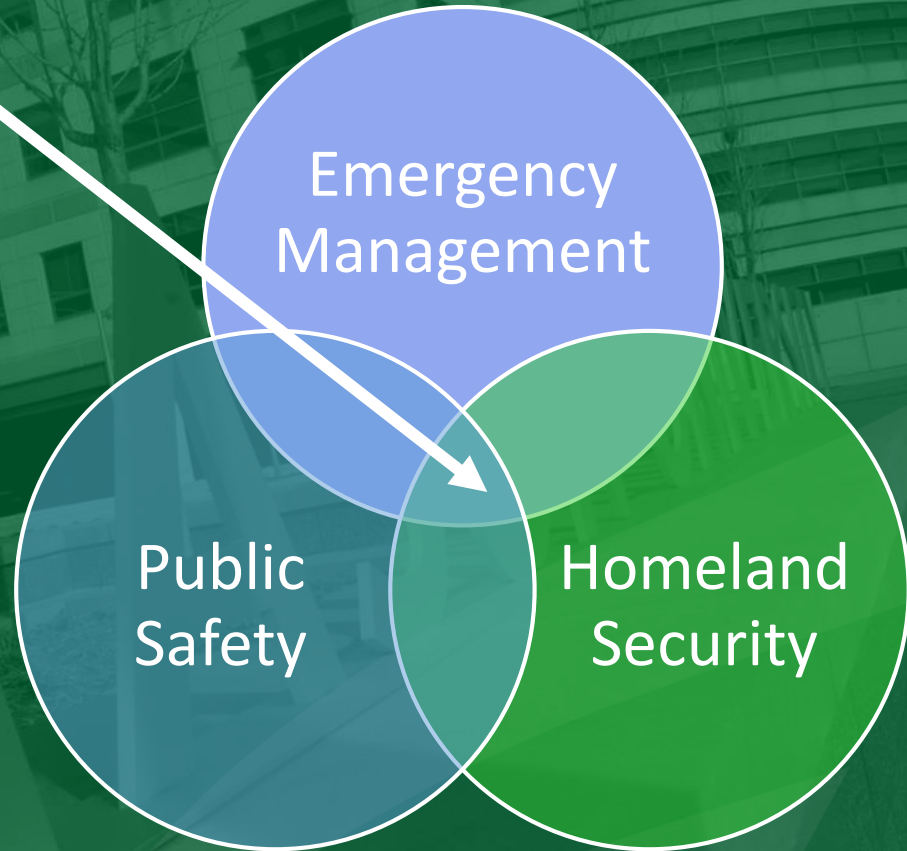
A framework for resiliency and sustainability should be developed in an integrated manner



A New Framework

An Integrated Approach to Resiliency and Sustainability

(utilization of the 3 C's)





Dr. Tonya T. Neaves
tneaves@gmu.edu
703/993.9377

Amb. (ret.) Rich Kauzlarich
rkauzlar@gmu.edu
703/993.9652

