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IBRD Systems Analysis Approach

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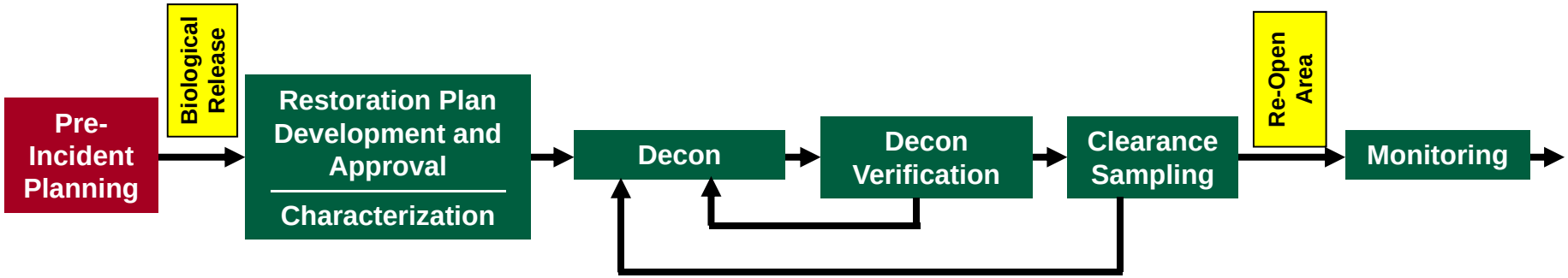
The restoration process for an indoor bio-release has been established…



Reference: DHS/USEPA Remediation Guidance for Major Airports after a Bioterrorist Attack, 2007

…what has not been established is the restoration strategy for a wide area urban bio-release

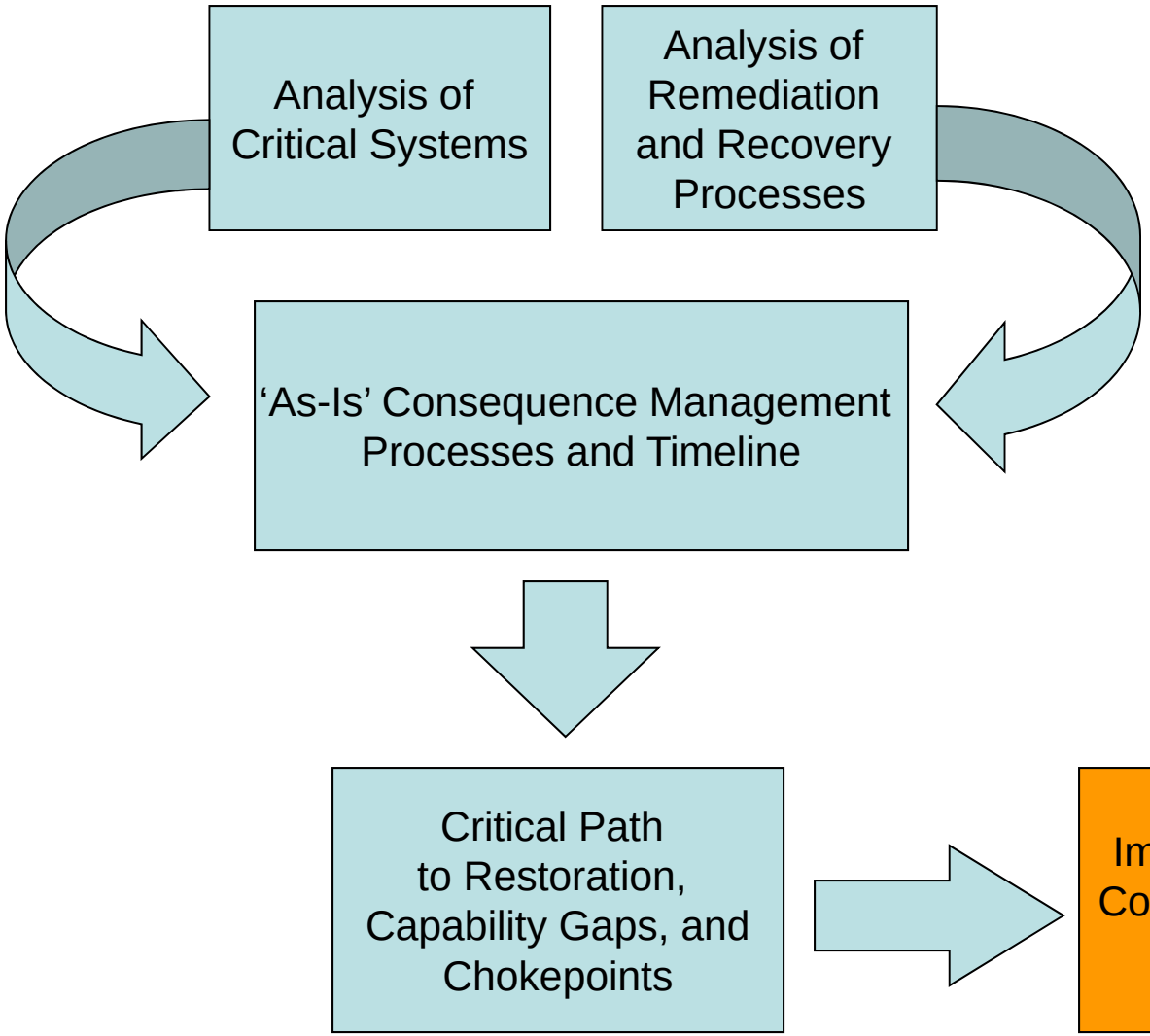
For example:
-- Given limited resources, what should be restored first?
-- What are appropriate methods for large-scale outdoor venues?

IBRD Systems Analysis will:

- Define critical systems
- Define restoration processes
- Determine how to apply limited restoration resources most efficiently to restore critical systems

IBRD systems analysis team will develop decision frameworks that help emergency managers prioritize the cleanup effort using science-based knowledge

In a wide area bio-release, critical systems in the urban area would be impacted and require restoration



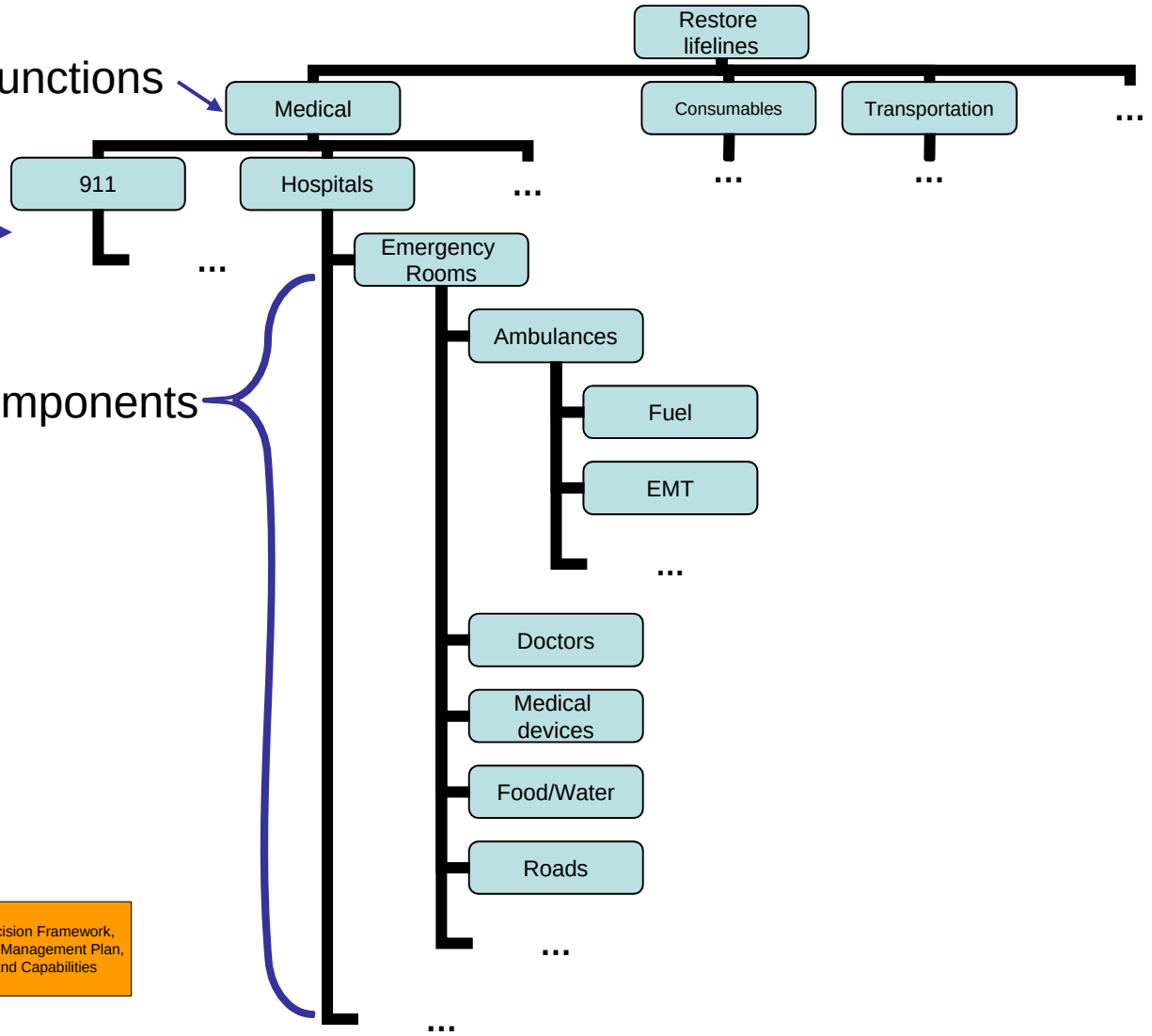
Critical Systems and Restoration Processes will be analyzed to develop IBRD program priorities

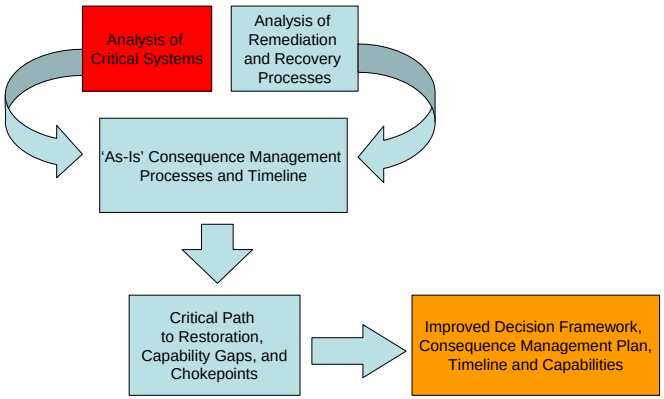
Analysis of Critical Systems will identify system components that must be restored after a bio-release

System Components diagrams will show:

- critical systems and functions
- critical operations
- critical operational components

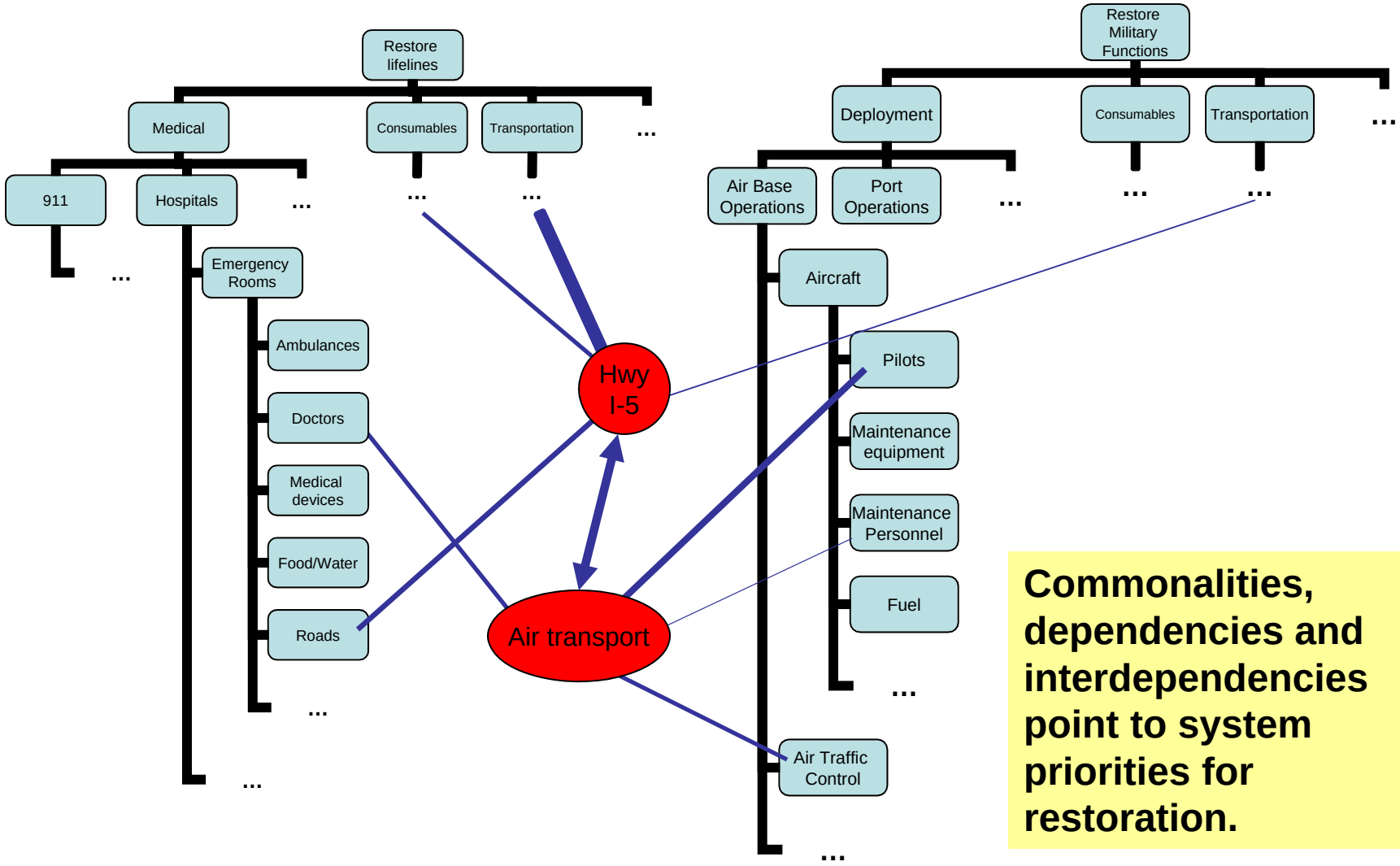
(Notional example)





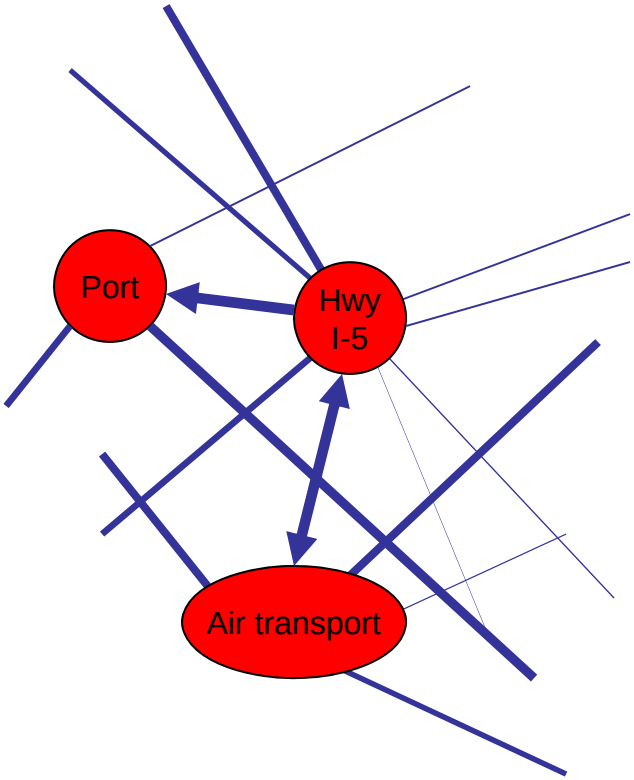
Critical Systems components are interdependent, and create a complex system network

There are many common critical operational components.
Critical functions and operations depend on other functions and operations.
These interdependencies are at different system levels and have different weights.



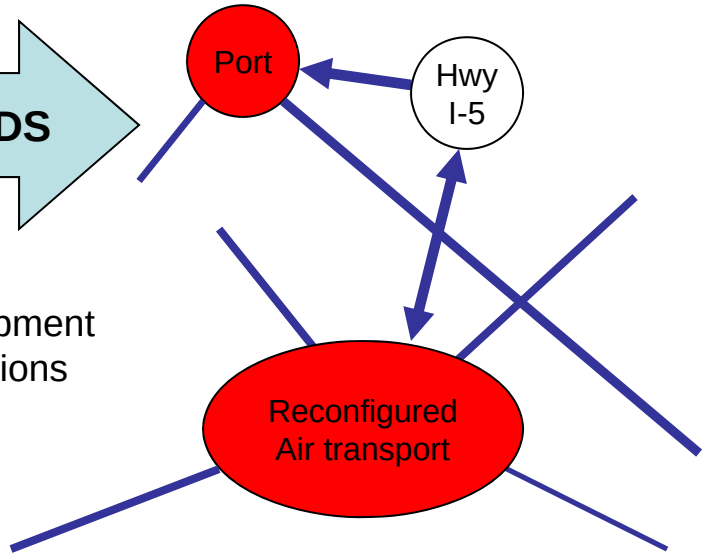
Commonalities, dependencies and interdependencies point to system priorities for restoration.

Work-around opportunities for Critical System components may shift restoration priorities

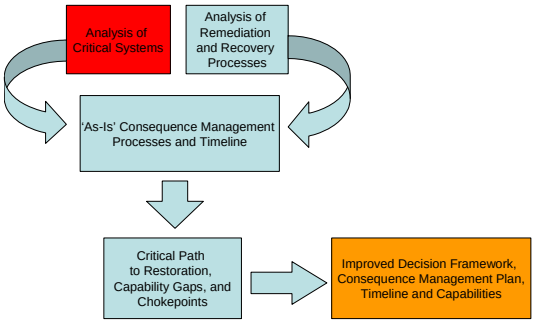


WORK-AROUNDS

For example:
-- substitution of equipment
-- relocation of operations



(work-around may be temporary)



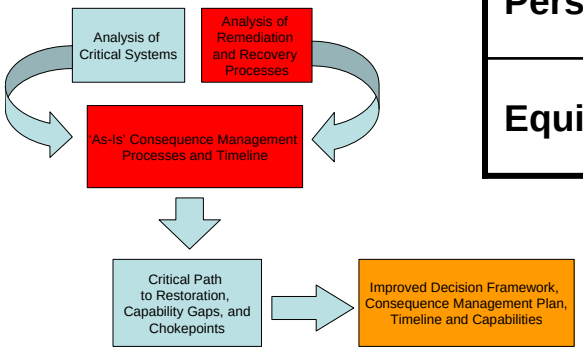
Analysis of Restoration Processes will identify existing capabilities and gaps

The systems analysis team will research and analyze the following areas:

Data gathering on as-is processes

Analysis

	Existing Capabilities (Local, Military, State, Federal)	Capacity/ Amount (Local, Military, State, Federal)	Limitations/ Gaps
Strategies, Plans	**X**		**X**
Technology	**X**		**X**
Roles and Responsibilities	**X**		**X**
Policy	**X**		**X**
Personnel	**X**	**X**	**X**
Equipment	**X**	**X**	**X**



The results from the Critical Systems analysis and Restoration Process analysis will be optimized to determine a Critical Path to Restoration

Prioritize critical systems

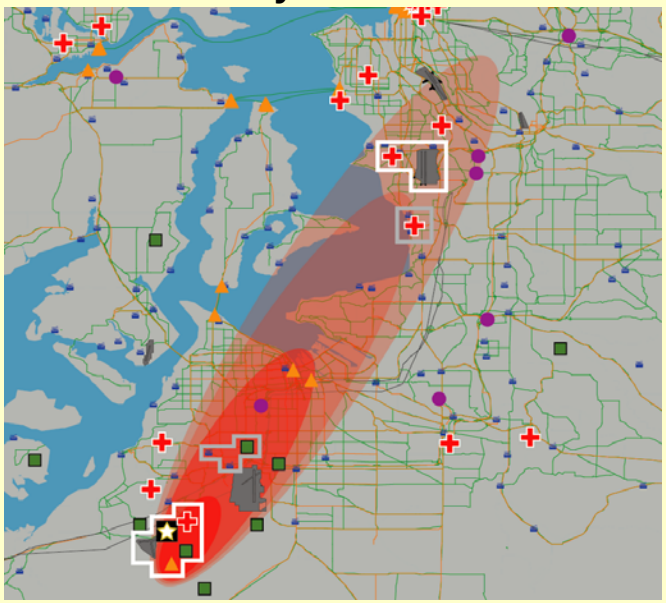
Facility A: required for > 25% operations
Facility B: temporary workaround possible & enables 85% ops
Outdoor Area X: required for access to Facility A
Critical Equipment Y: required
Personnel vaccination: increases acceptable contam level to __
…etc

Functionality #1 (e.g. transportation routes)

Functionality #2 (e.g. port operations)

Functionality #3 …

Determine and visualize contamination levels of critical systems



Assign limited restoration resources to system priorities

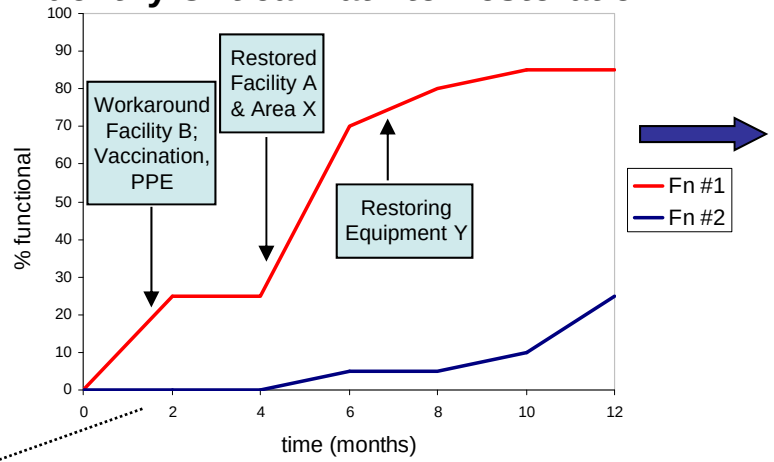
Facility A: remediate, Priority A; requires ___ equipment for ___ days
Facility B: work-around; defer remediation
Outdoor Area X: decon to __ background level, priority A; requires ___
Critical Equipment Y: decon, priority B; requires ____
Vaccinate key ops personnel; issue __ PPE
…

Functionality #1 (e.g. transportation routes)

Functionality #2 (e.g. port operations)

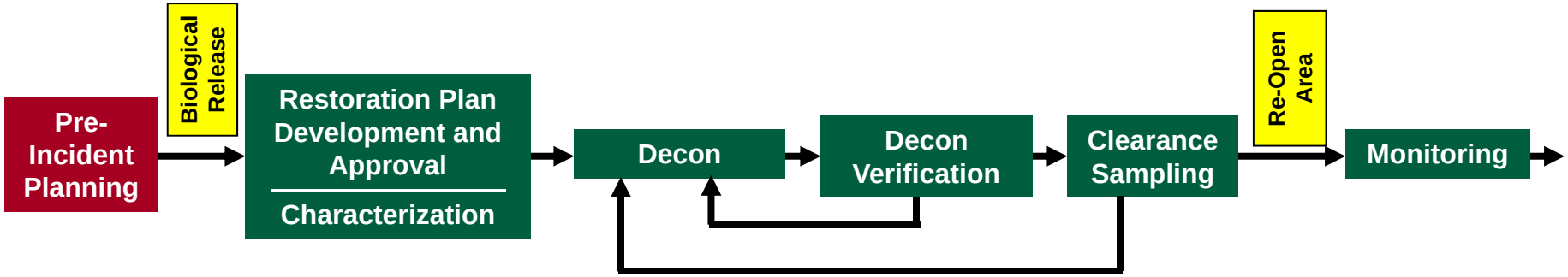
Functionality #3 …

Identify Critical Path to Restoration



Note: Also requires trade-off analysis re limited resources and would benefit from end-to-end systems model

From the critical path analysis, we will identify and prioritize Capability Gaps and Chokepoints that the IBRD program will address



For example:

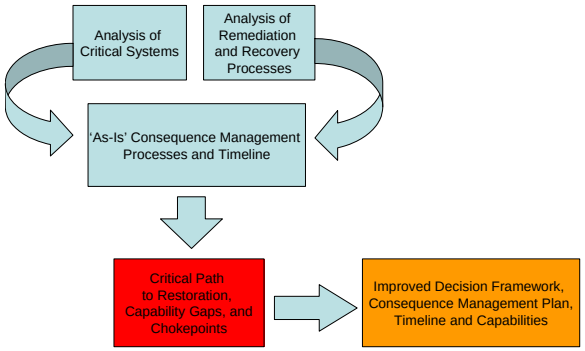
-Consequence management plans

-Critical path analysis
-Decision support tools

-Decon technology for facilities
-Decon technology for outdoor areas
-Decon technology for sensitive equipment
-Personnel Protective Equipment

-Sampling strategies
-Detectors
-Sampling methods
-Viability tests

-Monitoring strategies
-Long term monitoring technologies

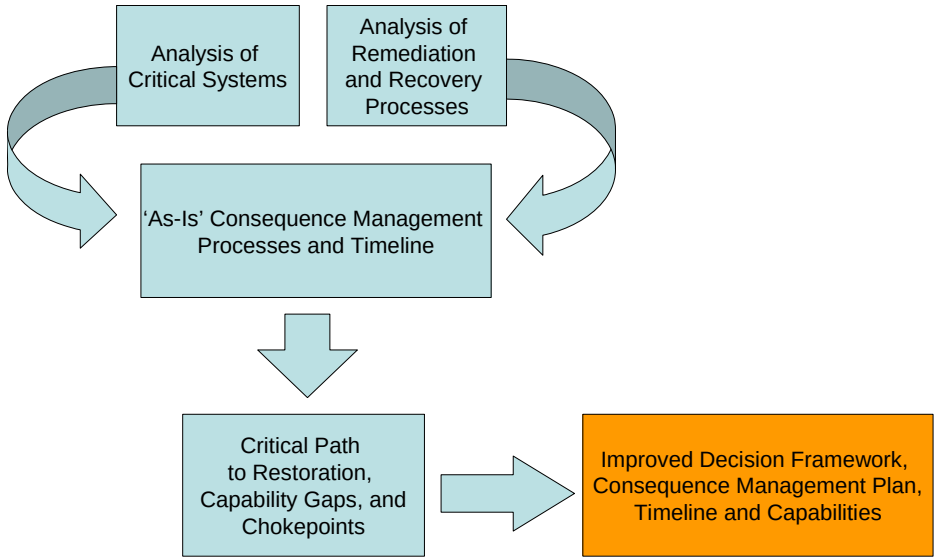


Scenario

- Based on National Planning Scenario #2, tailored for the Northwest region– affects civilian and military systems
- The scenario starts at the end of the initial response phase (days after the initial BioWatch positive)
- Initial conditions for the scenario:
  - Outdoor BioWatch detector positive
  - Positive secondary surface samples, both civilian area and military base
  - Sick people?
  - Evacuation: area and people

Why is this analysis useful?

- Systems analysis will provide a decision framework and a better understanding of critical paths for restoration in a wide area bio-attack and other catastrophic incidents in your community
- Systems analysis will inform IBRD program investments in technology to give the nation better restoration capability
- Analysis results will feed into improved consequence management and restoration plans
- Resulting decision framework will feed into a national architecture for bio-restoration



Systems Analysis Process

- Develop scenario (Apr 07)
- Gather data (Apr-Aug 07)
  - Interviews with local, military, state and federal decision-makers
  - Examination of existing plans
  - Literature search
- Workshops: to examine interdependencies and interactions (within and between civilian and military systems) (Aug 07)
- Analysis (Apr-Dec 07)