KANSAS CITYS, MISSOURI AND KANSAS FLOOD RISK MANAGEMENT PROJECT

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PRESENTATION OUTLINE

- USACE Civil Works Mission
- Kansas City Levee Proect History and Study
- USACE Levee Safety Program

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Civil Works - Value to the Nation

Recreation Areas
370 M Visitors/yr
Generating $18 B in
Economic Activity,
500,000 Jobs

450 Major Lakes &
Reservoirs

299 Deep Draft
Harbors

1/4 of Nation's
Hydropower:
$800 M + Sales

12,000 miles of
Inland Navigation
½ cost of Rail
or 1/10 of Trucking

400 miles of
Shore protection
Destination for
75% of U.S.
Vacations

627 Shallow
Draft Harbors

692 Dams
11,750 mi. of
Levees

Environmental
Infrastructure

153 Lakes
With Water
Supply Storage

Emergency
Operations

Stewardship of
11.7 Million Acres
Public Lands

Environmental
Restoration

Primary Civil Works Missions and Year Authorized

- Navigation (1824)
- Flood Risk Management (1936)
- Watershed Planning (1986)
- Ecosystem Restoration (1996)

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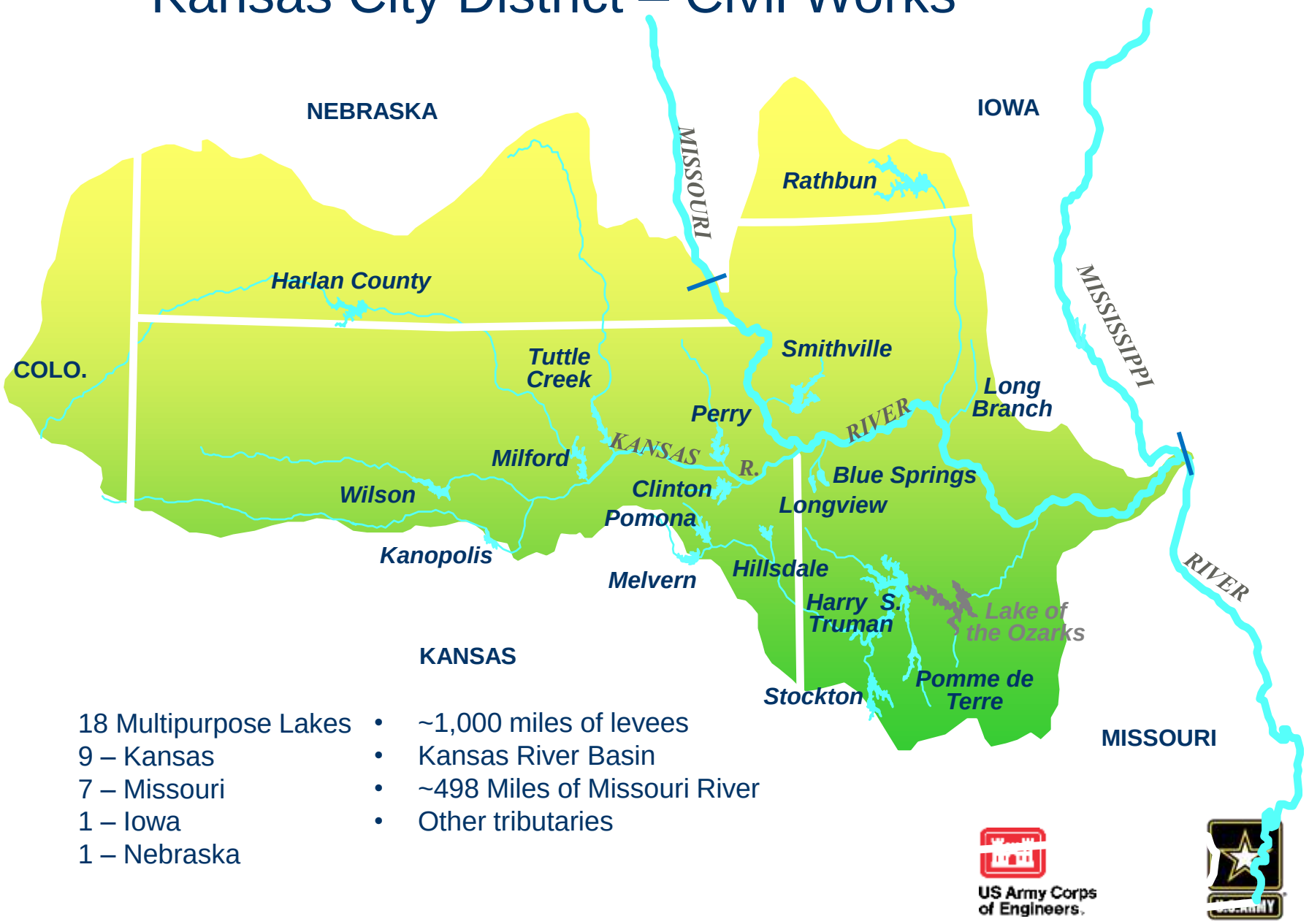
Kansas City District – Civil Works



18 Multipurpose Lakes
9 – Kansas
7 – Missouri
1 – Iowa
1 – Nebraska

- ~1,000 miles of levees
- Kansas River Basin
- ~498 Miles of Missouri River
- Other tributaries

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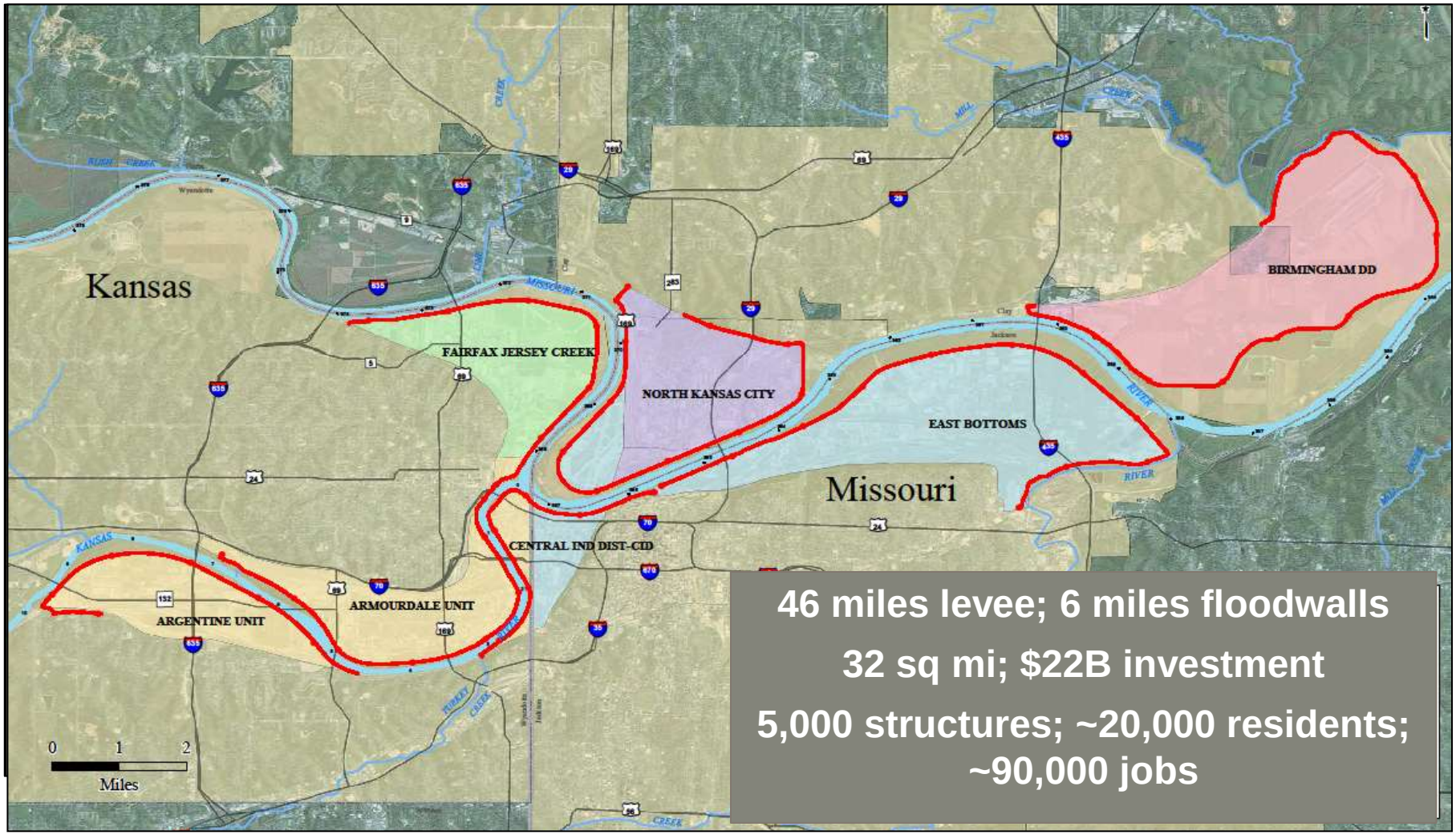
KANSAS CITY LEVEE SYSTEM



46 miles levee; 6 miles floodwalls

32 sq mi; $22B investment

5,000 structures; ~20,000 residents; ~90,000 jobs

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KANSAS CITY LEVEE SYSTEM FEATURES

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PROJECT HISTORY

- Kansas City floods in 1903 and 1908
- Early Local Flood Efforts
- Flood Control Act of 1936
- Flood Control Act of 1944

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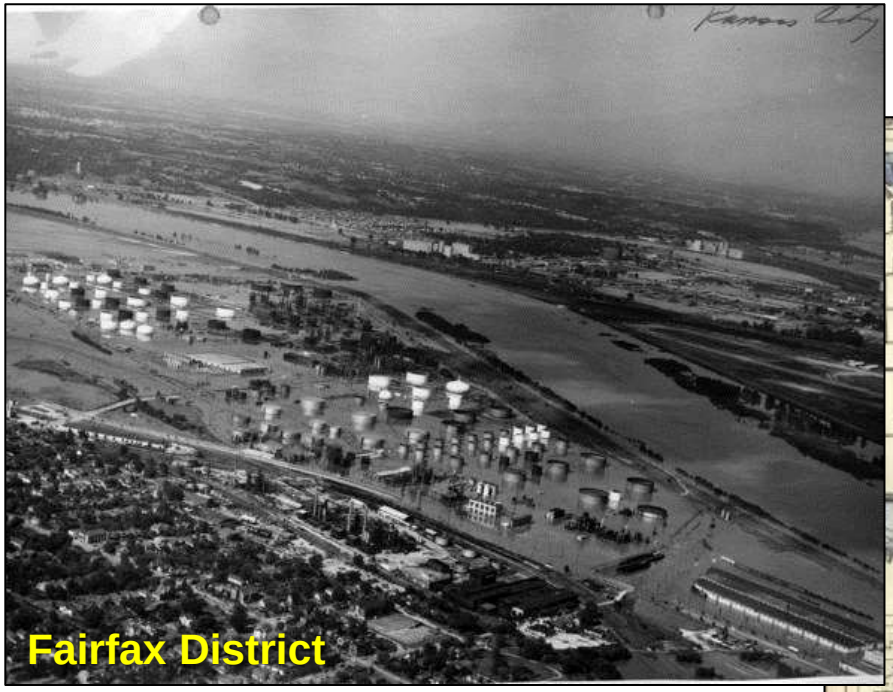
PROJECT HISTORY

Flood of 1951

- Kansas River Flood of Record
- Peak Flow ~510,000 cfs
- Multiple levee failures
- $462M damages (FY14: $8.23B)



PROJECT HISTORY

Flood of 1993

- Missouri River Event
- Passed Peak Flow ~543,000 cfs
- ~$4.5B damages prevented (FY14: $8.4B)

- 1993 performance concerns prompted Feasibility Study

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USACE FEASIBILITY STUDY

PURPOSE: Examine existing system performance and evaluate alternatives to identify and recommend a feasible plan to reduce flood risks while contributing to National Economic Development consistent with protecting the environment.

Study Process

- Identify problems and opportunities
- Inventory and forecast conditions
- Formulate, Evaluate, and Compare alternative plans
- Select a plan for recommendation

Plan Selection Criteria

Completeness, Effectiveness, Efficiency, Acceptability.

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Problem Identification

Authorized system discharge (1962):

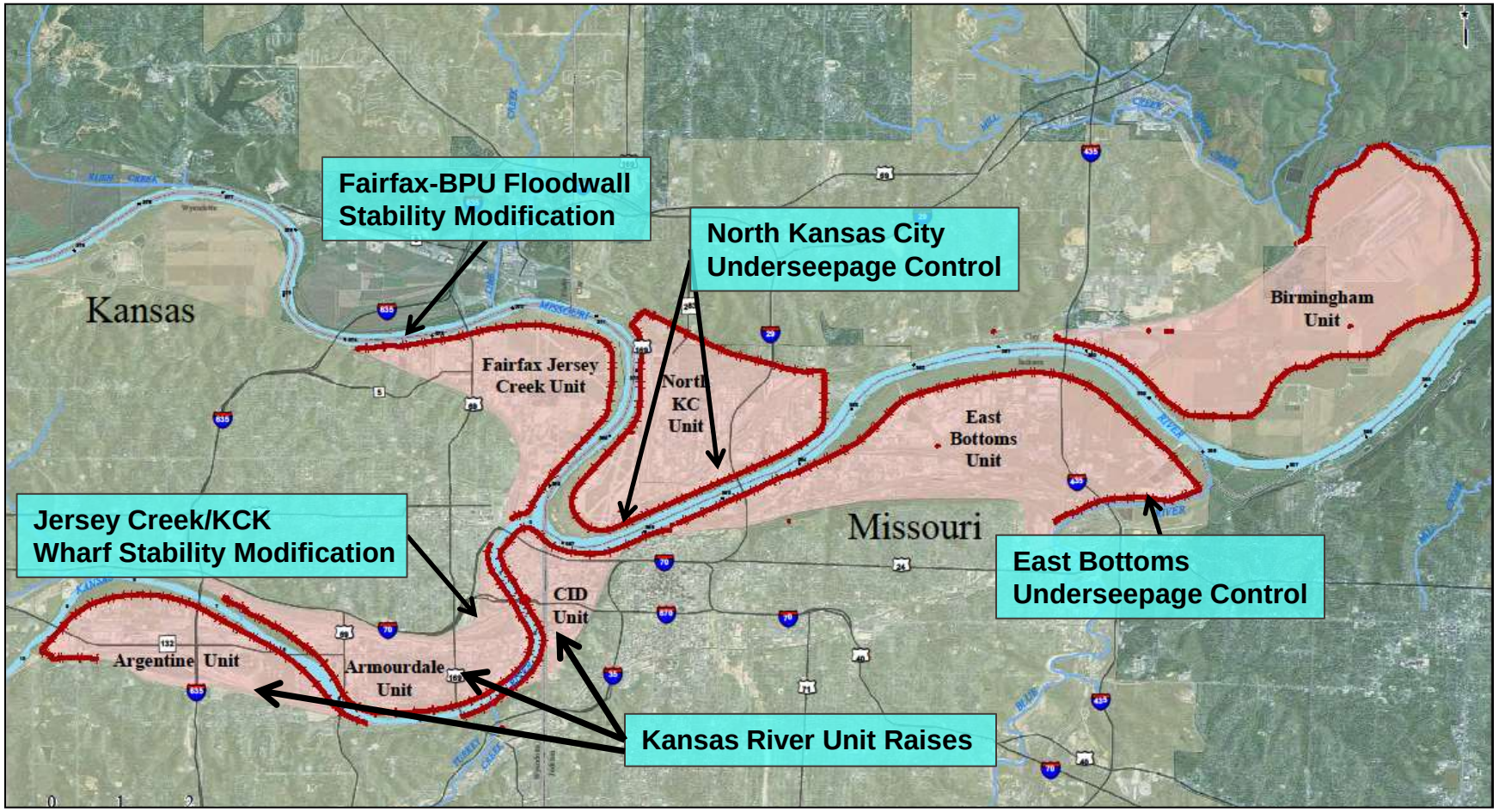
Kansas River	390,000 cfs	0.1%	(1/1000)
Missouri River (u/s)	220,000 cfs	5.0%	(1/20)
Missouri River (d/s)	610,000 cfs	0.08%	(1/1250)

Existing Condition Expected Performance:

Armourdale	3.69%	(1/27)
Argentine	1.34%	(1/75)
CID	0.47%	(1/213)
Fairfax-Jersey Creek	0.71%	(1/141)
North Kansas City	0.54%	(1/185)
East Bottoms	0.19%	(1/526)
Birmingham	0.13%	(1/769)

Opportunity: Identify modifications to establish a consistent level of performance across the system.

Kansas City Levee Recommended Plan



Construction Complete: North Kansas City Unit relief wells

Construction Underway: BPU floodwall, Jersey Creek/KCK Wharf, East Bottoms relief wells

Pending Design: Argentine, Armourdale and CID Unit modifications.

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RECOMMENDED PLAN
BENEFITS AND PERFORMANCE

Economic Analysis

w/o Annual Damages	$124,296
Annual Benefits	$ 98,141
Annual Costs	$ 21,766
Benefit/Cost	4.5
Net Benefits	$ 76,375
Residual Damages	$ 26,155

Oct 2013 prices; 3.5% interest rate; 50 year period of analysis; $1000s

Annual Exceedance Probabilities

Unit	Existing	Future
Armourdale	3.69	0.14
CID	0.47	0.19
Argentine	1.34	0.17
East Bottoms	0.19	0.10
North Kansas City	0.54	0.19
Fairfax-Jersey Creek	0.71	0.12
Birmingham	0.13	NA

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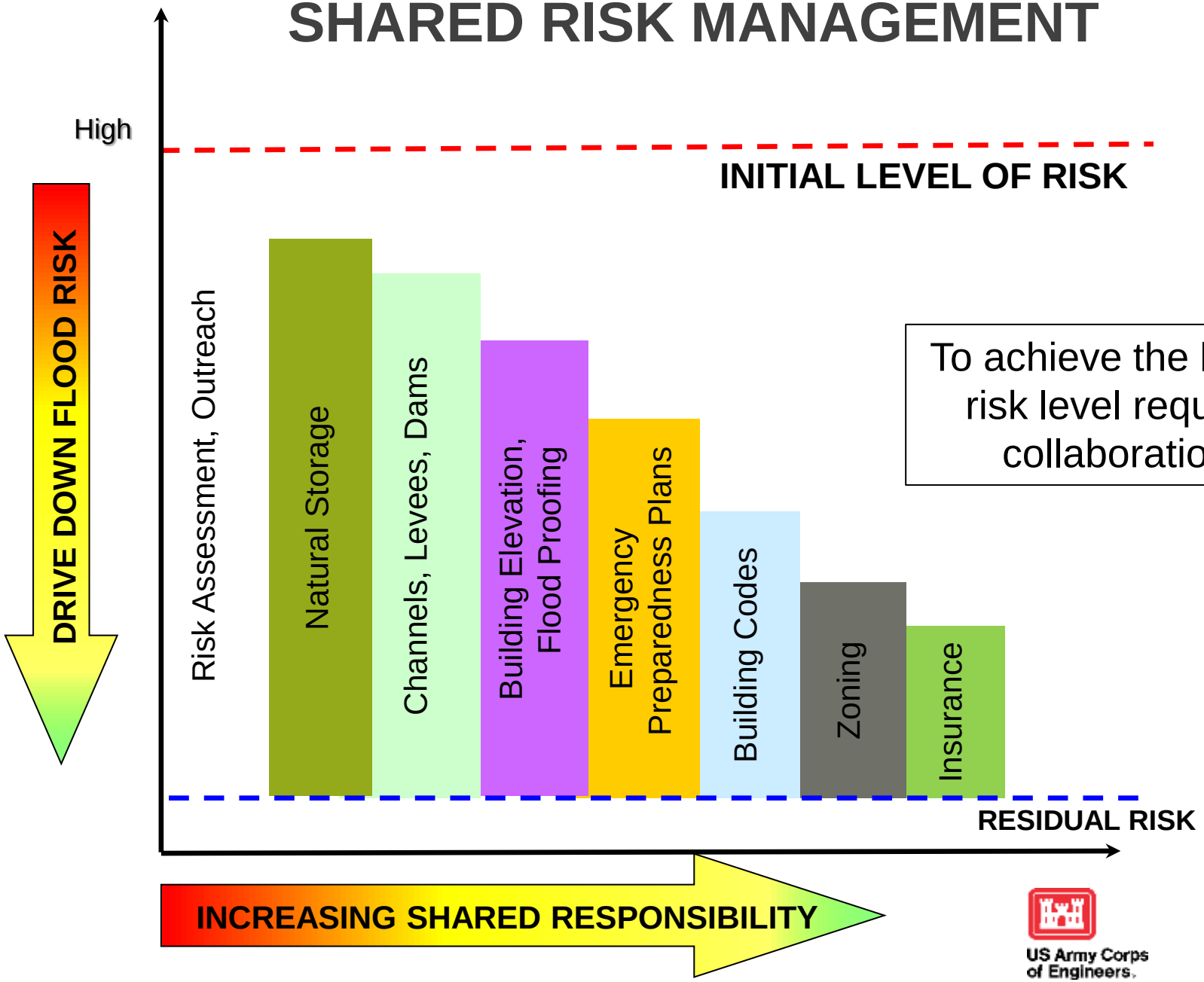
SHARED RISK MANAGEMENT



To achieve the lowest risk level requires collaboration.

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USACE Levee Safety Program Mission and Objectives

Topeka, Kansas 1993

Assess the integrity and viability of levees and recommend actions to assure that levee systems do not present unacceptable risks to the public, property, and the environment.

Osawatomie, Kansas – July 2007

- Hold Public Safety Paramount
  - Reduce Economic Impacts
  - Maximize Cost Effectiveness
- Develop Reliable and Accurate Information
  - Build Public Trust and Acceptance

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USACE LEVEE SAFETY PROGRAM

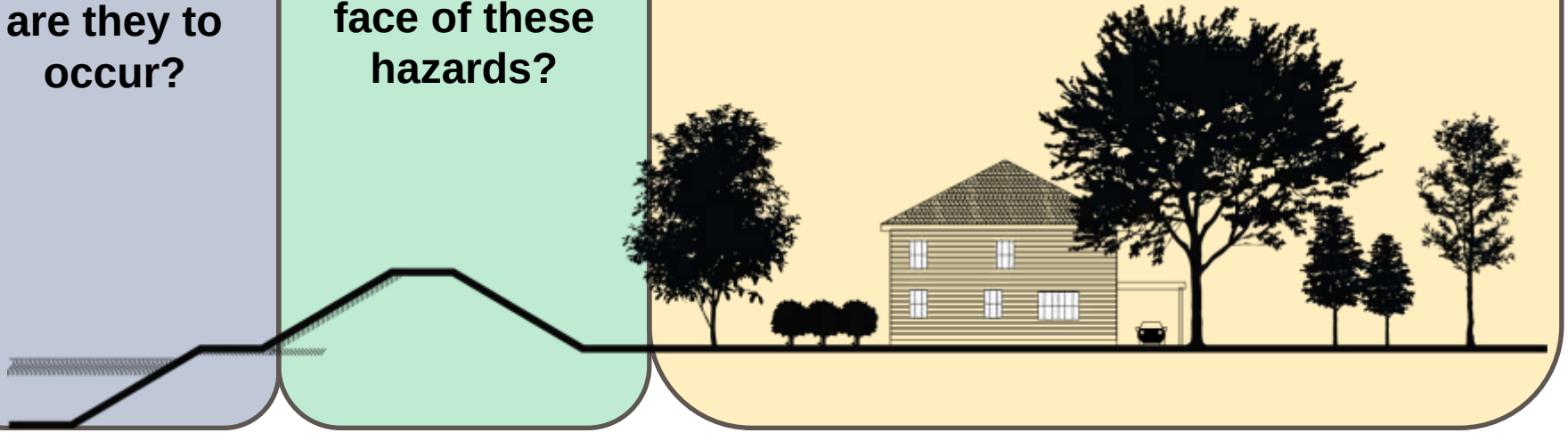
DEFINITION OF RISK

Risk = f(Hazard, Performance, Consequences)

What are the hazards and how likely are they to occur?

How will the infrastructure perform in the face of these hazards?

Who and what are in harms way? How susceptible to harm are they? How much harm is caused?



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CONSEQUENCE RISK MANAGEMENT

Continued diligent maintenance according to current standards
Transparent risk communication to floodplain users
Emergency planning and preparedness
Floodplain management planning
Non-structural flood risk mitigation

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Questions?

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