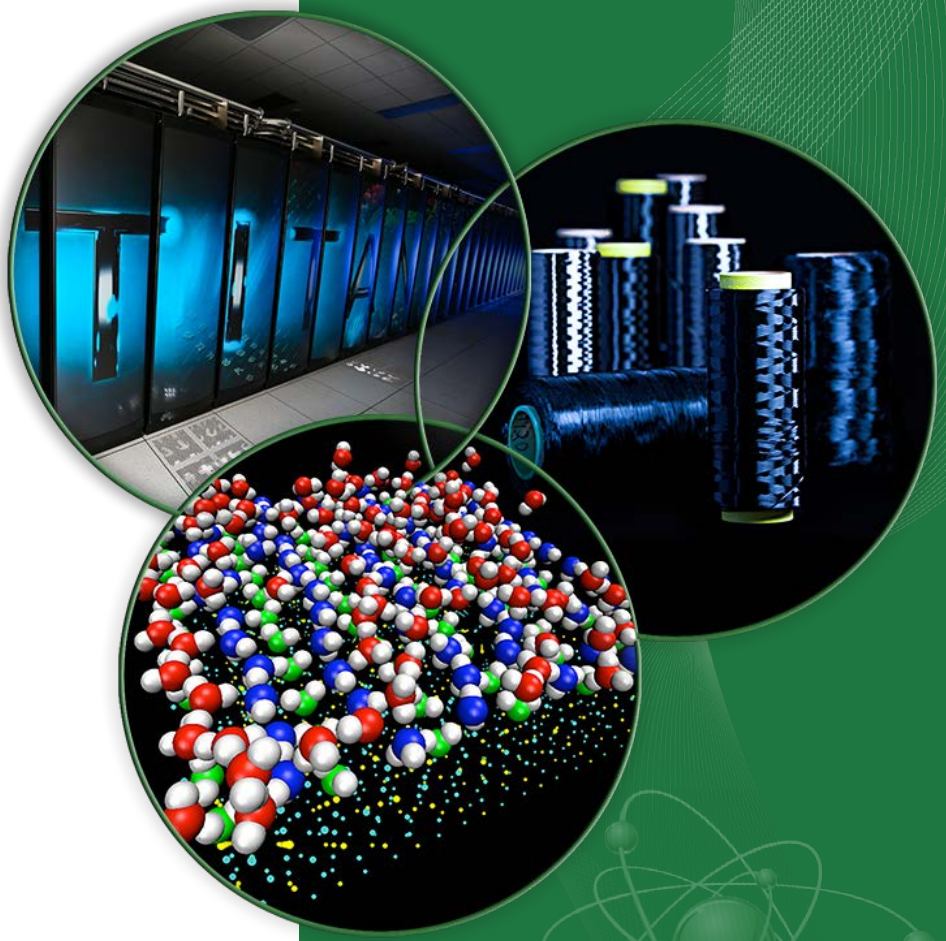
The Importance of Core Infrastructure



Presented to the

Commission to Review Effectiveness of National Energy Laboratories

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February 24, 2015

ORNL is managed by UT-Battelle
for the US Department of Energy

OAK RIDGE National Laboratory

Core infrastructure is important

Mission
Inadequate functionality

No place for microscope

Can't do specific pathogen free genetics

Unable to support supercomputer

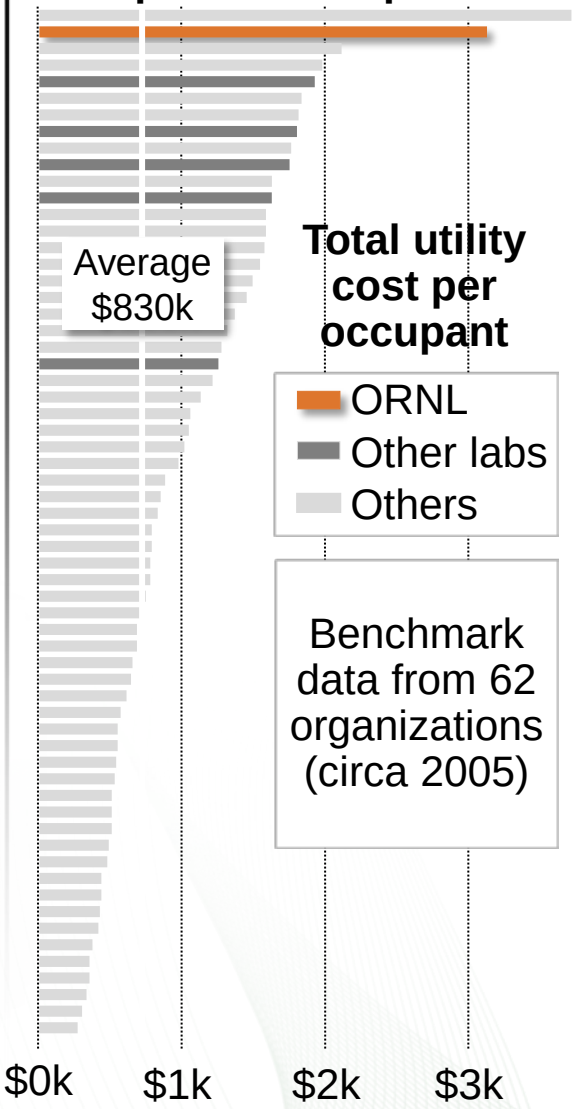
Safety
ES&H impacts

Near miss occurrence – fallen concrete

~25% of injuries due to legacy issues

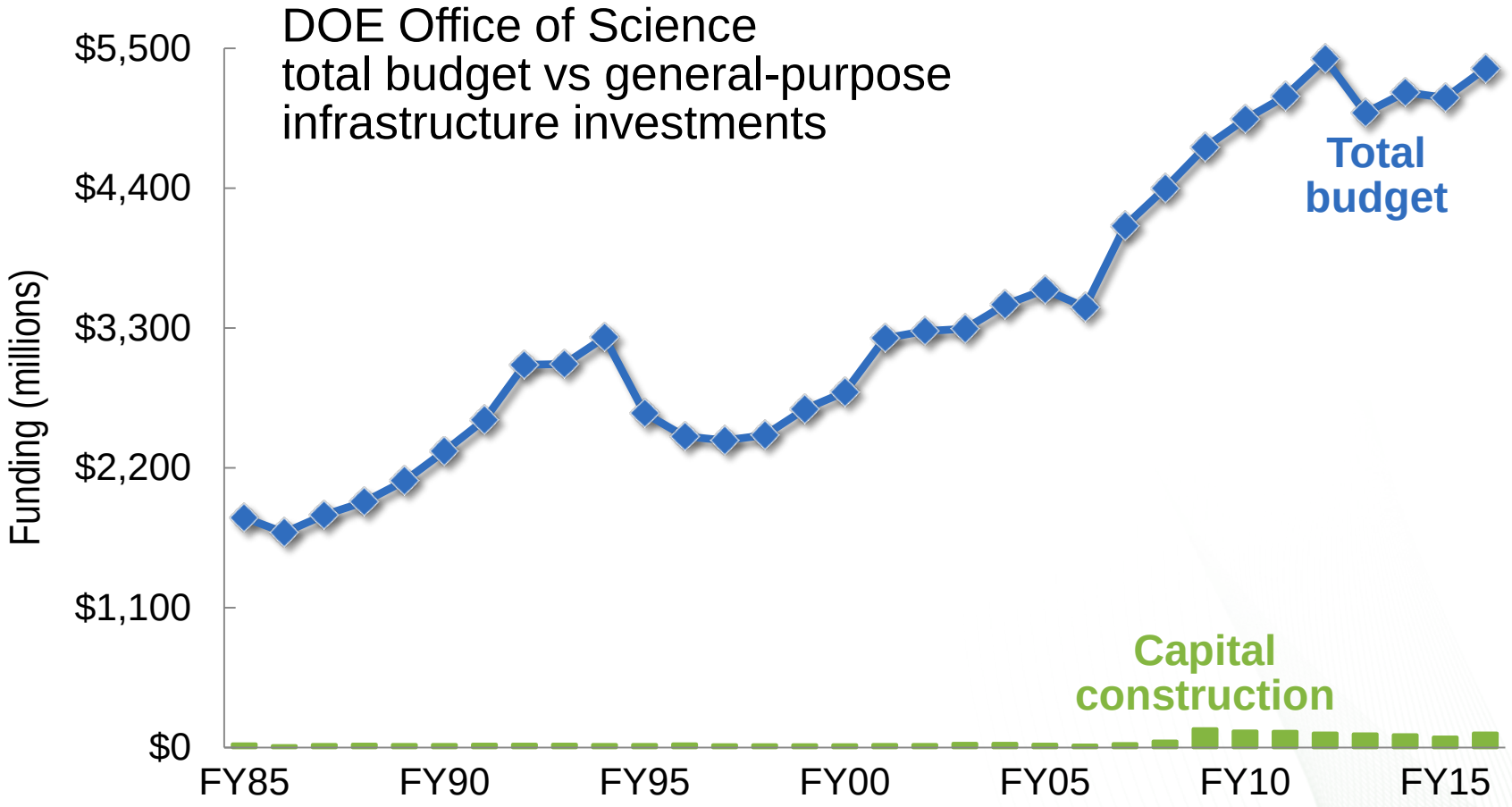
Failure in power supply to ventilation fans

Cost
Expensive to operate



OAK RIDGE National Laboratory

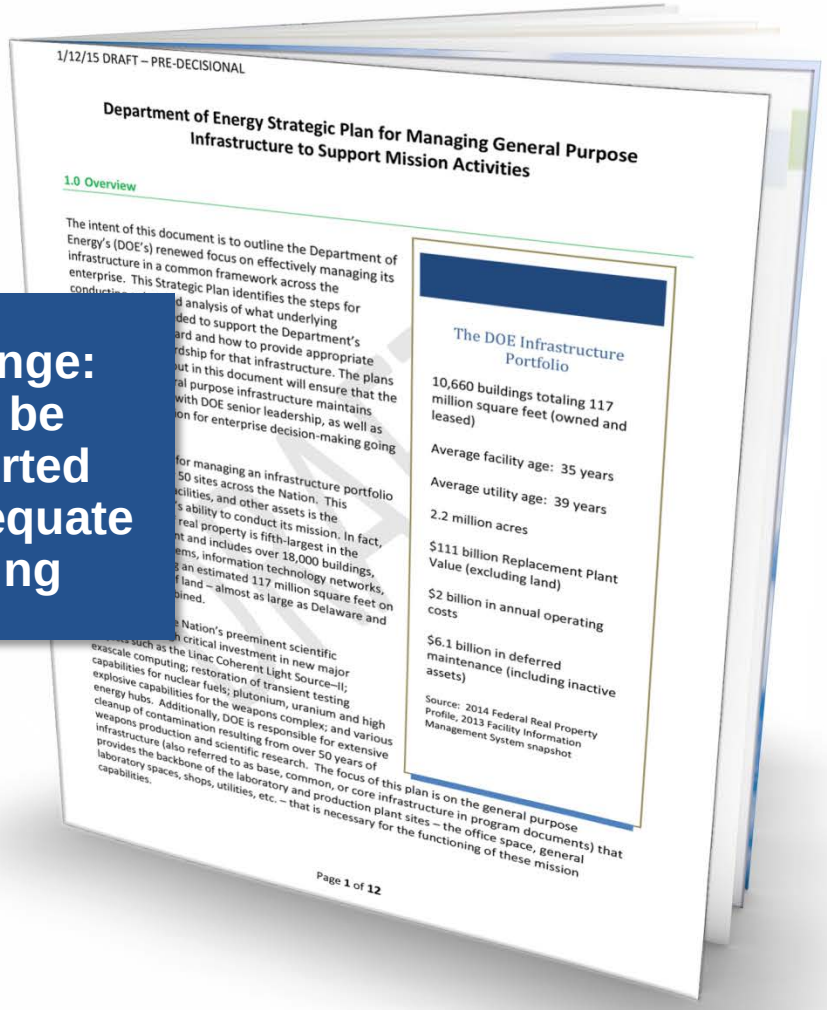
DOE's investment in core infrastructure has not kept up with needs



OAK RIDGE National Laboratory

Recent efforts to develop Strategic Infrastructure Plan is right approach

Challenge: Must be supported with adequate funding



1/12/15 DRAFT – PRE-DECISIONAL

Department of Energy Strategic Plan for Managing General Purpose Infrastructure to Support Mission Activities

1.0 Overview

The intent of this document is to outline the Department of Energy's (DOE's) renewed focus on effectively managing its infrastructure in a common framework across the enterprise. This Strategic Plan identifies the steps for ... analysis of what underlying ... to support the Department's ... and how to provide appropriate ... for that infrastructure. The plans ... in this document will ensure that the ... purpose infrastructure maintains ... with DOE senior leadership, as well as ... for enterprise decision-making going ...

... for managing an infrastructure portfolio ... 50 sites across the Nation. This ...cilities, and other assets is the ...'s ability to conduct its mission. In fact, ... real property is fifth-largest in the ...nt and includes over 18,000 buildings, ...ems, information technology networks, ... an estimated 117 million square feet on ...f land – almost as large as Delaware and ...bined.

... Nation's preeminent scientific ... critical investment in new major ... such as the Linac Coherent Light Source–II; exascale computing; restoration of transient testing capabilities for nuclear fuels; plutonium, uranium and high explosive capabilities for the weapons complex; and various energy hubs. Additionally, DOE is responsible for extensive cleanup of contamination resulting from over 50 years of weapons production and scientific research. The focus of this plan is on the general purpose infrastructure (also referred to as base, common, or core infrastructure in program documents) that provides the backbone of the laboratory and production plant sites – the office space, general laboratory spaces, shops, utilities, etc. – that is necessary for the functioning of these mission capabilities.

The DOE Infrastructure Portfolio

10,660 buildings totaling 117 million square feet (owned and leased)

Average facility age: 35 years

Average utility age: 39 years

2.2 million acres

$111 billion Replacement Plant Value (excluding land)

$2 billion in annual operating costs

$6.1 billion in deferred maintenance (including inactive assets)

Source: 2014 Federal Real Property Profile, 2013 Facility Information Management System snapshot

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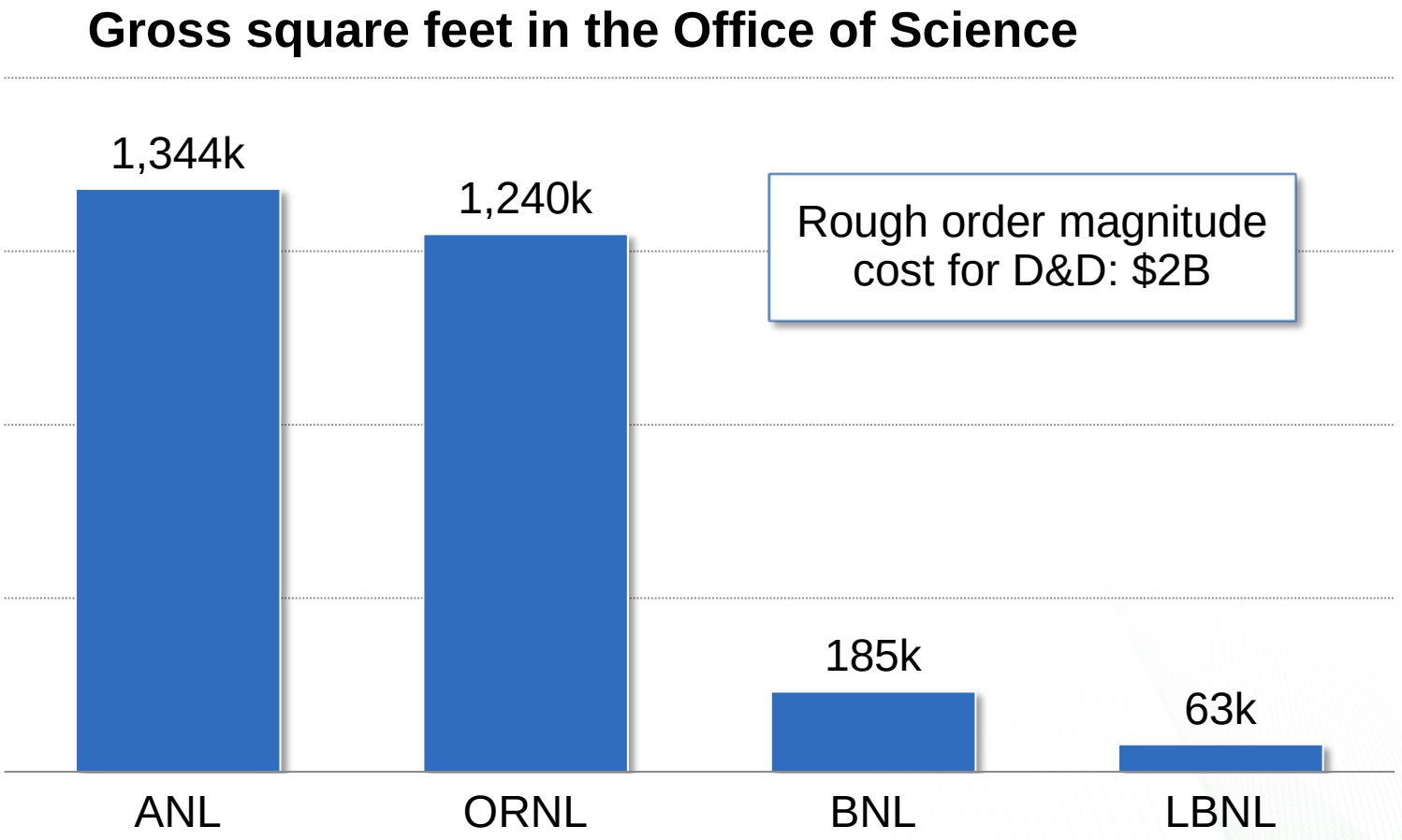
As a complex we still carry a significant burden of excess facilities



Who is accountable for life cycle cost of facilities?

Line item construction	Operation	D&D
1–4 years	5–40 years	Years?
Program responsibility	Program responsibility	

Transformation is possible, but it does take investment

Alternative financing is only 1 tool and it has limited application

	Private Sector	DOE
Cost/gross ft^2	$210	$322
Schedule	18 months	29 months
Safety	1 recordable injury	2 DART cases
Quality	 Class A	 Class A

397,000 ft^2

50,000 ft^2

UT-Battelle used a 3 part funding strategy to address aging infrastructure at ORNL

DOE

Major science facilities and infrastructure

- Pushing the edge of science and engineering
- Single-purpose “machines”
- Basic stewardship responsibility

State

Joint institutes with University of Tennessee

- Building collaborations for shared research opportunities
- Training of faculty and students
- Economic development for the state

Private Sector

COLLIERS KEENAN

Commercial laboratory and office space

- Public/private partnership enables government access to private financing
- Takes advantage of commercial practices – faster and cheaper

We have made substantial progress in updating ORNL's research campus

DOE Programmatic Investments		DOE Infrastructure Investments		Private Sector Investments			State of Tennessee Investments	
✓	Ultratrace Forensics Laboratory ($14M)	✓	Advanced Microscopy Laboratory ($5M)	✓	Computational Sciences Building		✓	Joint Institute for Computational Sciences ($10M)
✓	SANS Guide Hall at HFIR ($4M)	✓	Conference Center ($16M)	✓	Engineering Technology Facility	$72M total	✓	Joint Institute for Biological Sciences ($12M)
✓	Center for Nanophase Materials Sciences ($65M)	✓	High-bay area for fusion experiments ($5M)	✓	Research Office Building			
✓	Spallation Neutron Source ($1,400M)	✓	Chemical and Materials Sciences Building ($95M)	✓	Multiprogram Research Facility ($40M)		✓	Joint Institute for Neutron Sciences ($8M)
✓	Guest House ($9M)	✓	Numerous utility and hardscape projects (~$15M/year)					
✓	MAXLAB ($16M)							

ORNL’s East Campus Today

But we have more to do

FY15 Lab Plan presented to the Office of Science

5 objectives drive our most pressing infrastructure needs

- Sustain world leadership in neutron sciences
- Sustain world leadership in HPC
- Preserve core nuclear capabilities
- Revitalize core infrastructure
- Reduce impact of legacies

Questions