



What NSF Is Looking for in E-CORE

A Guide for West Virginia Idea Development Based on Analysis of Successful Funded E-CORE Proposals

Purpose: This document is intended to help prospective contributors develop strong ideas for West Virginia's E-CORE concept. It is not a proposal template. Furthermore, prospective contributors should not attempt to recreate aspects of successful E-CORE proposals. Instead, this guide is intended to illustrate features of the E-CORE program by referring to concrete examples from successful proposals. This document is a guide to understanding what the NSF intends E-CORE projects to accomplish and how successful jurisdictions have translated statewide challenges into competitive ecosystem-building investments.

Understanding E-CORE

E-CORE Is Not Primarily a Research Grant

Wrong question for E-CORE:

"What research area should West Virginia invest in?"

Right Question for E-CORE:

"What statewide capability should exist in West Virginia that does not exist today?"

E-CORE projects are topic agnostic: not organized around a scientific topic. Instead, they are organized around an ecosystem problem.

Note on Methodology and Limitations: To better understand the intent of the E-CORE program, this document reviews all publicly available E-CORE awards and associated project materials. The analysis presented is drawn from the complete set of funded E-CORE projects, not a partial subset. The examples provided are intended to illustrate how jurisdictions have translated ecosystem challenges into infrastructure, partnerships, pathways, and other ecosystem-building mechanisms within the E-CORE framework. All of the examples in this document illustrate a key component of a successful E-CORE, not the totality of a given project's activities or the full scope or STaR's analytic review.

Examples

State	Problem	Solution
Mississippi	Research infrastructure is fragmented and difficult to access	Statewide research alliance and shared instrumentation system
Kentucky	Critical climate information is disconnected and difficult to use	Statewide climate-data platform
New Mexico	Emerging research institutions are disconnected from major research networks	Research pathways and cyberinfrastructure integration
South Carolina	Students lack coordinated STEM pathways	Statewide pathway and faculty-development system
Rhode Island	Research activity lacks coordination and public translation	Partnership and science communication infrastructure

Across funded projects, NSF repeatedly invested in:

- Research support systems
- Shared infrastructure
- Workforce pathways
- Administrative capacity
- Collaboration networks
- Research translation
- Cyberinfrastructure
- Community engagement
- Seed funding systems
- Partnerships between institution types

In concrete terms, E-CORE funds things like:

- Statewide researcher directories
- Instrumentation exchanges
- Seed-funding systems
- Faculty mentoring programs
- STEM pathway redesigns
- Administrative networks
- Governance structures
- Development of digital platforms

Feature #1: Solve a Statewide Bottleneck

Example: [Mississippi Research Alliance's](#) Instrumentation Access Mechanism

MISSISSIPPI'S PROBLEM:

RESEARCHERS OFTEN COULD NOT EASILY DISCOVER:

- AVAILABLE EQUIPMENT
- AVAILABLE EXPERTISE
- EXISTING FACILITIES
- POTENTIAL COLLABORATORS

MISSISSIPPI'S SOLUTION:

NOT TO BUY NEW EQUIPMENT – INSTEAD, BUILD A STATEWIDE COORDINATION MECHANISM THAT INCLUDED:

- SHARED RESOURCE EXCHANGE PORTAL
- RESEARCH NETWORK DIRECTORY
- INSTRUMENTATION VOUCHER PROGRAM
- SEED GRANT SYSTEM

Takeaway:

E-CORE funds a mechanism, not a discipline.

Potential examples:

- Collaborative proposal development
- Shared equipment access
- Faculty recruitment
- Community college transitions
- Industry research partnerships
- Research data sharing
- Internships
- Technology commercialization



Photo Credit: [https:// https://www.msresearchalliance.org/about-us](https://www.msresearchalliance.org/about-us)

"What barrier keeps West Virginia institutions from working together more effectively?"

Feature #2: Build Pathways

Example: [South Carolina SC-CAPS's](#) Faculty and Undergrad Development Plan

SOUTH CAROLINA'S CHALLENGE: LOTS OF PUI, NOT MANY R-1

- OVER 30 PUI IN THE STATE
- PUI FACULTY STRUGGLE TO FIND TIME TO DEVELOP AS RESEARCHERS
- LOTS OF UNDERGRADS BUT NOT ENOUGH RESEARCH OPPORTUNITY TO SERVE THEM

SOUTH CAROLINA'S WORKFORCE IMPROVEMENT PLAN

- HIGH SCHOOL RESEARCH EXPERIENCES
- INTERNSHIP OPPORTUNITIES
- SEED GRANTS FOR EQUIPMENT
- UNDERGRADUATE RESEARCH
- FACULTY DEVELOPMENT
- INSTITUTIONAL GROWTH INITIATIVES

Takeaway:

Pathways are infrastructure.

A competitive concept might ask:

- How do students move from community colleges into research institutions?
- How do undergraduate researchers become graduate students?
- How do graduates remain in West Virginia's workforce?
- How do researchers connect with employers?

SC-CAPS - Three Core Programs

- **Experiential Learning Core** — Engages high school, transfer, and undergraduate students across all 11 campuses to build research skills, expand institutional research capacity, and broaden participation in STEM.
- **Building STEM Pathways Core** — Focuses on retention, on-time graduation, and career readiness through evidence-based strategies including articulation agreements, high school bridge programs, enhanced advising, and peer mentoring.
- **Faculty and Institutional Growth Core** — Supports faculty development through institutional commitments and programmatic initiatives designed to strengthen research competitiveness and secure long-term sustainability.

(Source: <https://scepscor.org/sc-caps/>)

NSF repeatedly funds systems that help people move through educational and workforce pipelines.

Feature #3: Create Networks

Example: [New Hampshire NH-LIFT](#)'s Broad-based Expansion of Research Opportunities

NEW HAMPSHIRE'S PROBLEM:
LOTS OF TALENT, BUT MANY SMALLER
INSTITUTIONS LACKED ACCESS TO:

- RESEARCH SUPPORT SERVICES
- ADVANCED INSTRUMENTATION
- MENTORING
- RESEARCH DEVELOPMENT EXPERTISE

NEW HAMPSHIRE'S SOLUTION:
NH-LIFT SOLUTION INCLUDED:

- RESEARCH SUPPORT CORE
IMPROVES PROPOSAL DEVELOPMENT AND RESEARCH SUPPORT ACTIVITIES.
- ACADEMIC INFRASTRUCTURE & RESEARCH FACILITIES CORE
BUILDS STATEWIDE ACCESS TO FACILITIES AND SPECIALIZED EQUIPMENT.
- EARLY CAREER RESEARCH PATHWAY CORE
CREATES MENTORING AND CAREER-DEVELOPMENT STRUCTURES.
- ADMINISTRATIVE CORE

Takeaway:

Networks are infrastructure.

A network becomes infrastructure when it:

- Has formal governance
- Provides services
- Coordinates resources
- Persists after the grant ends (i.e., is sustainable)

The Four Cores of NH-LIFT



NH- LIFT Co-PI, Dr. James Newcomb, Professor of Biology and Health Science at New England College, works alongside a student in the College's Summer Undergraduate Research Program. NH-LIFT will expand research opportunities like this to students throughout NH.

Research Support Core

Broaden funded research participation at non-R1 institutions and small businesses through improved research support and service capacity.

Academic Infrastructure & Research Facilities Core

Create a statewide network of core facilities to broaden access to advanced instrumentation and technical expertise in support of research, workforce training, and economic development.

Early Career Research Trainee Pathway Core

Increase student and early career researcher success through programming and partnerships to support mentoring, career development, and retention across the jurisdiction.

Administrative Core

Create a coordinated jurisdiction-wide culture of collaboration that connects the research environment for all participants.

Photo Credit: www.nhepscor.org/photos/nh-lift/

Feature #4: Connect Underutilized Institutions

Example: [New Mexico RIO-NM](#)'s Inclusion of Disparate Institutions

NEW MEXICO'S TATIC: FOCUS ON EMERGING RESEARCH INSTITUTIONS (ERI)

- COMMUNITY COLLEGES
- HISPANIC-SERVING INSTITUTIONS
- TRIBAL COLLEGES

MANY HAD BEEN DISCONNECTED FROM LARGER RESEARCH NETWORKS.

CONNECT THEM HOW?:

- **CYBERINFRASTRUCTURE CORE**
CONNECTING INSTITUTIONS THROUGH SHARED DIGITAL SYSTEMS.
- **RESEARCH PATHWAYS CORE**
CREATING PATHWAYS FOR STUDENTS, FACULTY, AND RESEARCHERS.
- **PILOT PROGRAMS**
TESTING NEW APPROACHES.
- **SEED AWARDS**
HELPING ERIS LAUNCH ACTIVITIES AND BECOME MORE COMPETITIVE.



Takeaway:

Inclusion are infrastructure.

Questions for West Virginia:

- Which institutions are disconnected from research activity?
- Which regions are isolated?
- Which populations face barriers to participation?
- What structures would permanently reduce those barriers?



RIO-NM is organized around three cores:

Cyberinfrastructure Core (CI Core)

Build research cyberinfrastructure capacity at New Mexico's higher education institutions

Research Pathway Core (Pathways Core)

Connect researchers, faculty, and students at New Mexico's higher education institutions with resources and programs.

Administrative Core (Admin Core) will

Administer the RIO-NM project to promote excellence and ensure compliance with funder and institutional policies.

(Source: <https://www.nmepscor.org/projects/rio-nm>)

Feature #5: Build Platforms

Example: [Kentucky CAPTIVATE-KY](#)'s Data Access Angle

KENTUCKY'S PROBLEM: DATA WAS NOT ORGANIZED INTO A USEABLE SYSTEM

- **FRAGMENTED DATA**
- **DIFFICULT TO USE**
- **WORKFORCE PATHWAYS**

KENTUCKY'S SOLUTION: BUILD A STATEWIDE PLATFORM THAT INCLUDES:

- **DATA AGGREGATION**
- **VISUALIZATION TOOLS**
- **PUBLIC ACCESS SYSTEMS**
- **ENVIRONMENTAL DATA**
- **CURRICULUM**
- **TEACHER TRAINING**
- **CYBERINFRASTRUCTURE FOR INFORMATION SHARING**

Takeaway:

Platforms are infrastructure.

Examples include:

- Data repositories
- Research portals
- Collaboration systems
- Equipment-sharing platforms
- Workforce-information systems
- Proposal-development platforms

CAPTIVATE Collaborators

CAPTIVATE KY is led by the Kentucky Science and Engineering Foundation (KSEF) and supported by a growing network of statewide partners.



Photo Credit: www.ksef.kstc.org/captivate-ky/

A platform can serve many disciplines simultaneously.

Lessons from the E-CORE Portfolio

The following infrastructure models appear repeatedly across funded projects.

Shared Research Assets

Examples:

- Mississippi
- New Hampshire
- Oklahoma

Common features:

- Core facility networks
- Instrument sharing
- Researcher directories
- Access systems

Workforce Pathways

Examples:

- South Carolina
- South Dakota
- North Dakota

Common features:

- Student pipelines
- Teacher support
- Research experiences
- Career pathways

Cyberinfrastructure

Examples:

- Kentucky
- New Mexico
- Puerto Rico

Common features:

- Data platforms
- Shared computing
- Digital research environments
- Statewide information systems

Governance and Coordination

Examples:

- Mississippi
- Arkansas
- Rhode Island

Common features:

- Steering committees
- Statewide offices
- Partnership management
- Ecosystem coordination

Broadening Participation

Examples:

- New Mexico
- Vermont
- North Dakota

Common features:

- Tribal colleges
- Emerging institutions
- Rural communities
- Underrepresented populations

Developing a Strong West Virginia Concept

Consider the following questions when writing a white paper:

Problem

What statewide barrier currently limits research competitiveness?

Scale

Does the problem affect multiple institutions, sectors, or regions?

How does your solution relate with priorities already found in [Vision 2030](#), the West Virginia State Science & Technology Plan?

Sustainability

What remains after NSF funding ends?

How does your solution make use of resources and institutions already present in West Virginia?

Partnerships

Who must work together for success?

Consider:

- Community colleges
 - Industry
 - State government
 - Nonprofits
 - Workforce organizations
 - Community stakeholders
-

Infrastructure

What new capability will exist?

Examples:

- A statewide network
- A platform
- A workforce pathway
- A governance mechanism
- A facility-sharing system
- A research support system

Impact

How will West Virginia be different in five years?

"West Virginia will have _____ that it does not have today."

All E-CORE-funded programs to date:

Jurisdiction	Award Title	Award Number	Project Website	Abstract
Arkansas	E-CORE RII: Arkansas Nexus for Excellence in Technology, Workforce, Outreach and Research Knowledge	2438206	https://arnetwork.aralliance.org/	Award Details and Abstract
Delaware	E-CORE RII: Strengthening Partnerships for Advancing Research Capacity in Delaware	2438144	Delaware EPSCoR Research Core Areas - Delaware EPSCoR	Award Details and Abstract
Guam	E-CORE RII: Optimizing Research Infrastructure in Guam	2438132	E-CORE - Guam EPSCoR	Award Details and Abstract
Kentucky	E-CORE RII: Technology for Innovative Visualization, Aggregation & Training in	2438201	CAPTIVATE KY Kentucky Science & Engineering Foundation	Award Details and Abstract

	Environmental Preparedness and Resilience for Kentucky			
Louisiana	E-CORE RII: Louisiana Networks of Excellence for Tomorrow	2437963	LA-EPSCoR-Update-V.16.1.pdf	Award Details and Abstract
Maine	E-CORE RII: Strengthening Maine's Research Ecosystem and Pathways Through Strategic Capacity Building	2412130	https://umaine.edu/epscor/projects/	Award Details and Abstract
Mississippi	E-CORE RII: Mississippi Research Alliance	2433435	https://www.msresearchalliance.org/	Award Details and Abstract
Nebraska	E-CORE: Nebraska Strengthening Partnerships for Innovation, Research, and Education (NSPIRE)	2539252	epscor.nebraska.edu/nspire/	Award Details and Abstract
New Hampshire	E-CORE RII: New Hampshire Long-term Investment to Fuel Transformative Research	2412054	https://www.nhepscor.org/projects/nh-lift	Award Details and Abstract
New Mexico	E-CORE RII: Research Infrastructure Optimization for New Mexico	2435071	https://www.nmepscor.org/projects/r-io-nm	Award Details and Abstract
North Dakota	E-CORE RII: Sustainable Programs Advancing Research and Knowledge across North Dakota	2438102	SPARK-ND ND EPSCoR	Award Details and Abstract

Oklahoma	E-CORE: Oklahoma Research, Innovation, and Opportunity Network	2539517	https://www.onenet.net/grant-funded-project-expands-oklahomas-research-network-to-four-additional-campuses/	Award Details and Abstract
Puerto Rico	E-CORE: Research Infrastructure for AI-based Sustainable STEM Technologies in Puerto Rico	2539413	UPR secures \$9 million to advance AI research	Award Details and Abstract
Rhode Island	E-CORE RII: Rhode Island Inclusive Network for Excellence in Science and Technology	2433276	https://web.uri.edu/rinsfepscor/rinest/	Award Details and Abstract
South Carolina	E-CORE: South Carolina Collaborative Academic Pathways in STEM	2539219	SC-CAPS – South Carolina EPSCoR	Award Details and Abstract
South Dakota	E-CORE RII: South Dakota Research Ecosystem Network: Advancing STEM Education	2412056	NSF funds South Dakota STEM education pathways - Dakota State University	Award Details and Abstract
Vermont	E-CORE RII: The Science and Technology Research Initiative for the Vermont Economy	2438168	NSF STRIVE Vermont STEM Research, Education & Innovation	Award Details and Abstract