Leveraging NSF's Investments in Research – Support for Commercialization and Entrepreneurship

Fen Zhao
NSF's Innovation Corps Programs

National Science Foundation
WHERE DISCOVERIES BEGIN

To promote the progress of science;

to advance the national health, prosperity, and welfare;

to secure the national defense....

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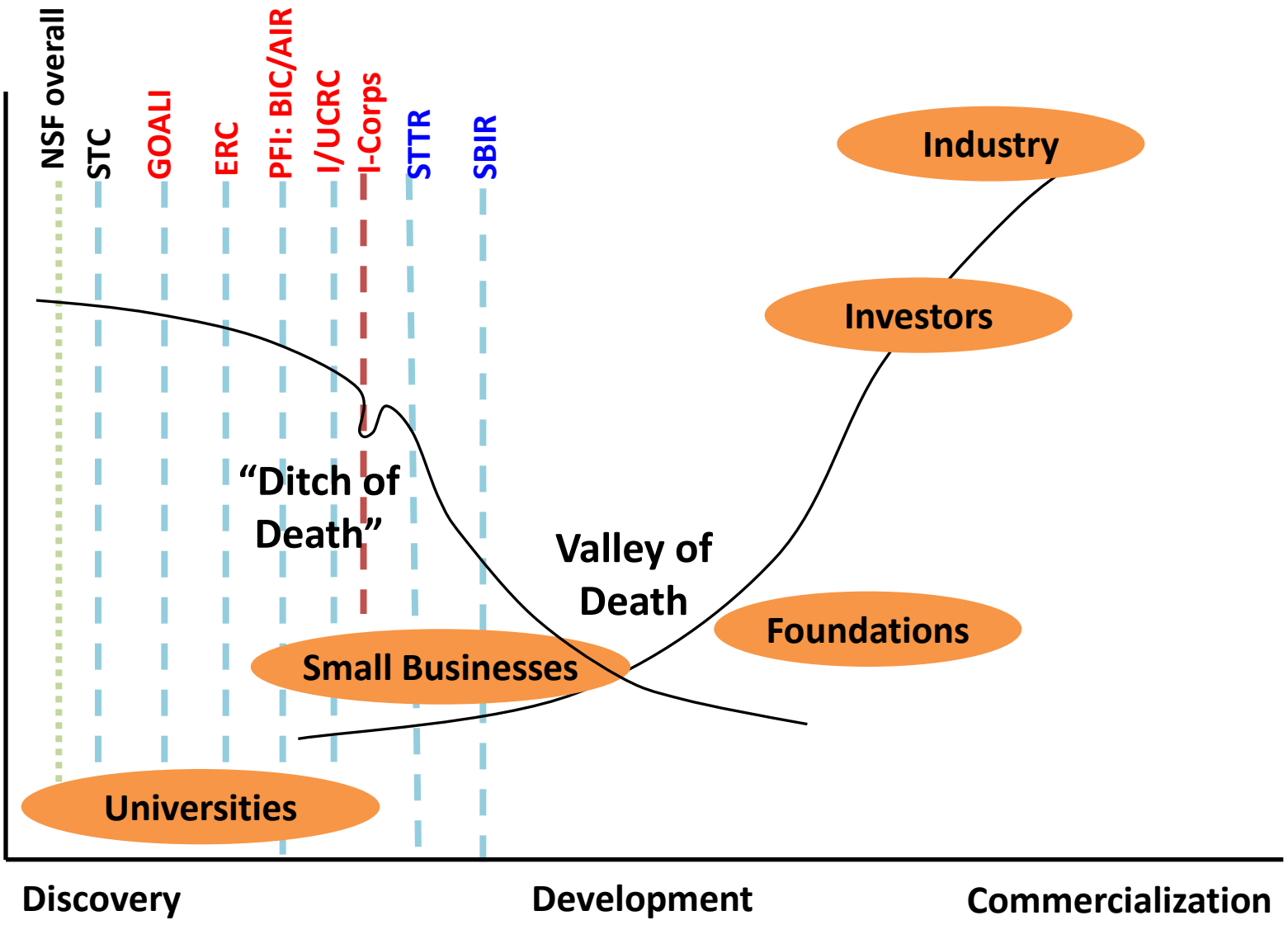
CISE's Economic and Societal Context

- The Directorate of Computer and Information Science and Engineering (CISE) is at the center of an ongoing, long-term societal transformation
- Advances in computing, communications, information technologies, cyberinfrastructure:
  - underpin economic prosperity, national security
  - drive U.S. competiveness and sustainable economic growth
  - accelerate the pace of discovery and innovation
  - are crucial to achieving national and societal priorities

Research to Commercialization: Filling the Gap



I-Corps is NSF's Response …
To Successfully Translate Innovations from Lab to Market

- Leverage NSF's investments and broaden the impact of NSF-funded research
- Prepare scientists and engineers to expand their focus beyond the laboratory into entrepreneurship and commercialization
- Promote the commercial success and societal benefit of new technologies funded by the US Government
- Turn ideas into companies
- Change the lives of researchers and the cultures of academic institutions

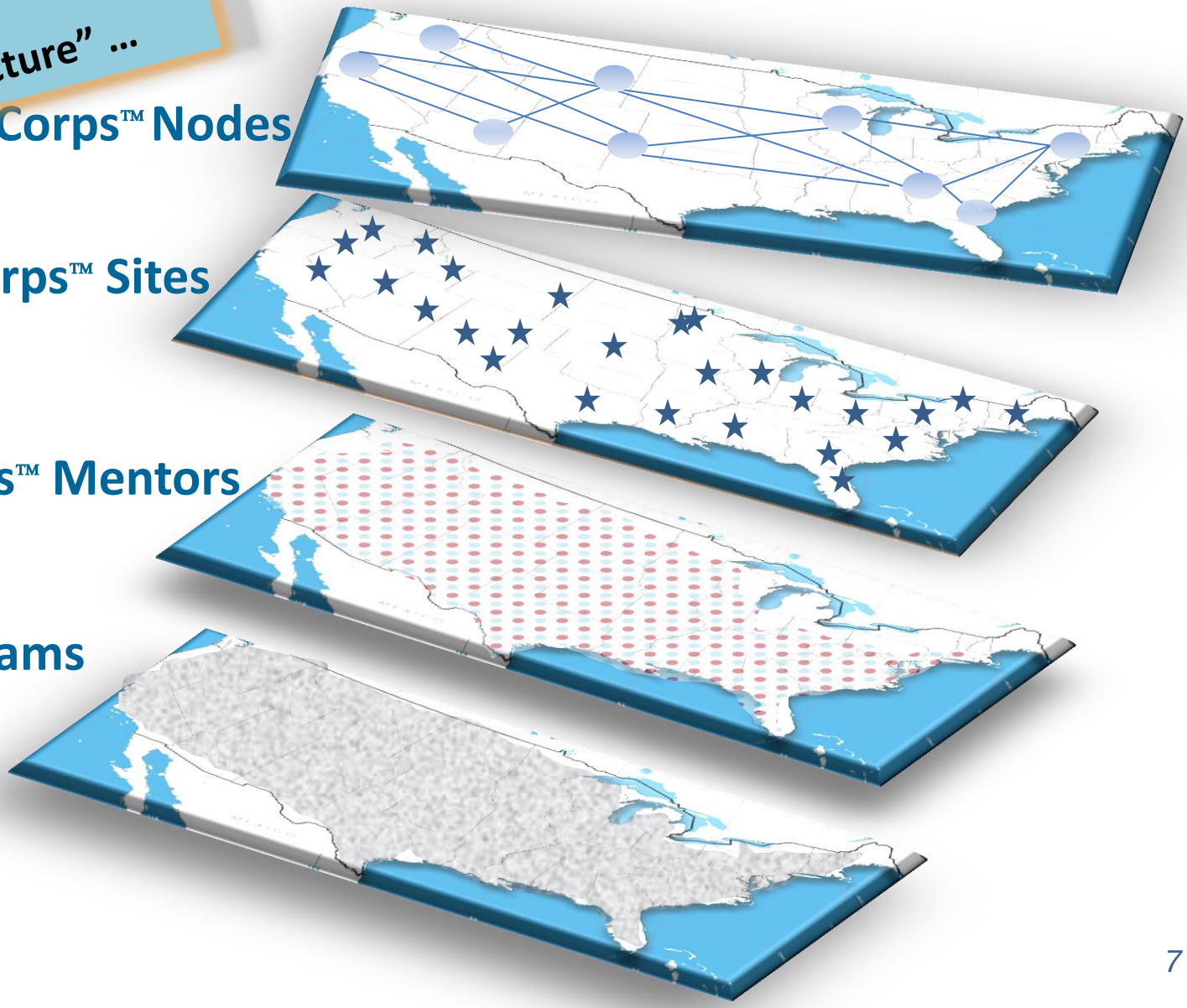
This is a "tall-order" – it's a "we're going to change the world kind of goal!"

I-CORPS™ NSF Innovation Corps

How are we achieving the I-Corps™ Objectives?

The "Big Picture" …

Building the Nation's I-Corps™ "Innovation Fabric"



I-CORPS™ NSF Innovation Corps

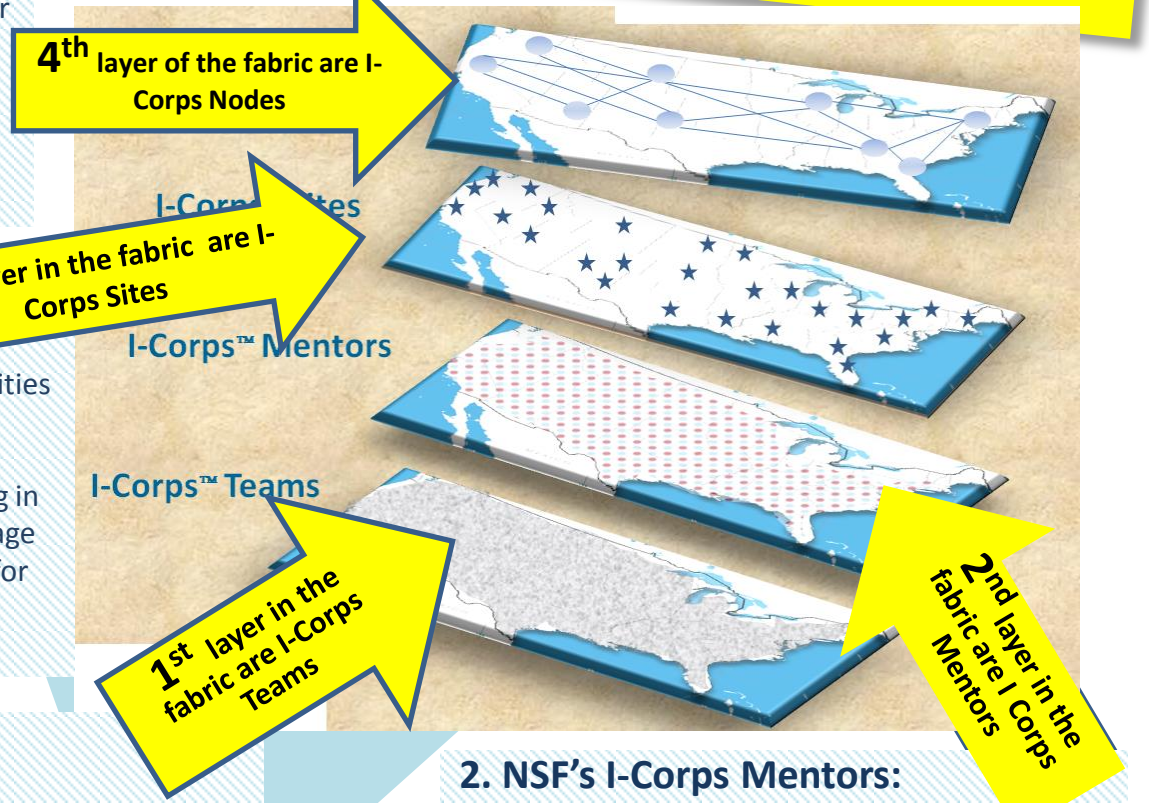
NSF is weaving the "fabric" of a National Innovation Network (NIN) with I-Corps

4. NSF's I-Corps Nodes:

- NSF's I-Corps **Nodes** Program funds collaborations among several regional universities ($1.25M/year for up to 3 years) to deliver lean start-up curriculum to NSF's I-Corps Teams, to build tools and processes to bolster start-up success, and to engage in research into entrepreneurship.
- As of '15 there are 7 Nodes.

3. NSF's I-Corps Sites:

- NSF's I-Corps **Sites** Program funds individual universities ($100K/year for up to 3 years), with already existing entrepreneurship centers.
- From the $100K award, the Site invests seed funding in their own local teams ($1K to $3K per team) to engage in lean start-up. Those teams then become eligible for NSF's I-Corps Teams Program and a $50K award.
- As of '15 there are 36 Sites.



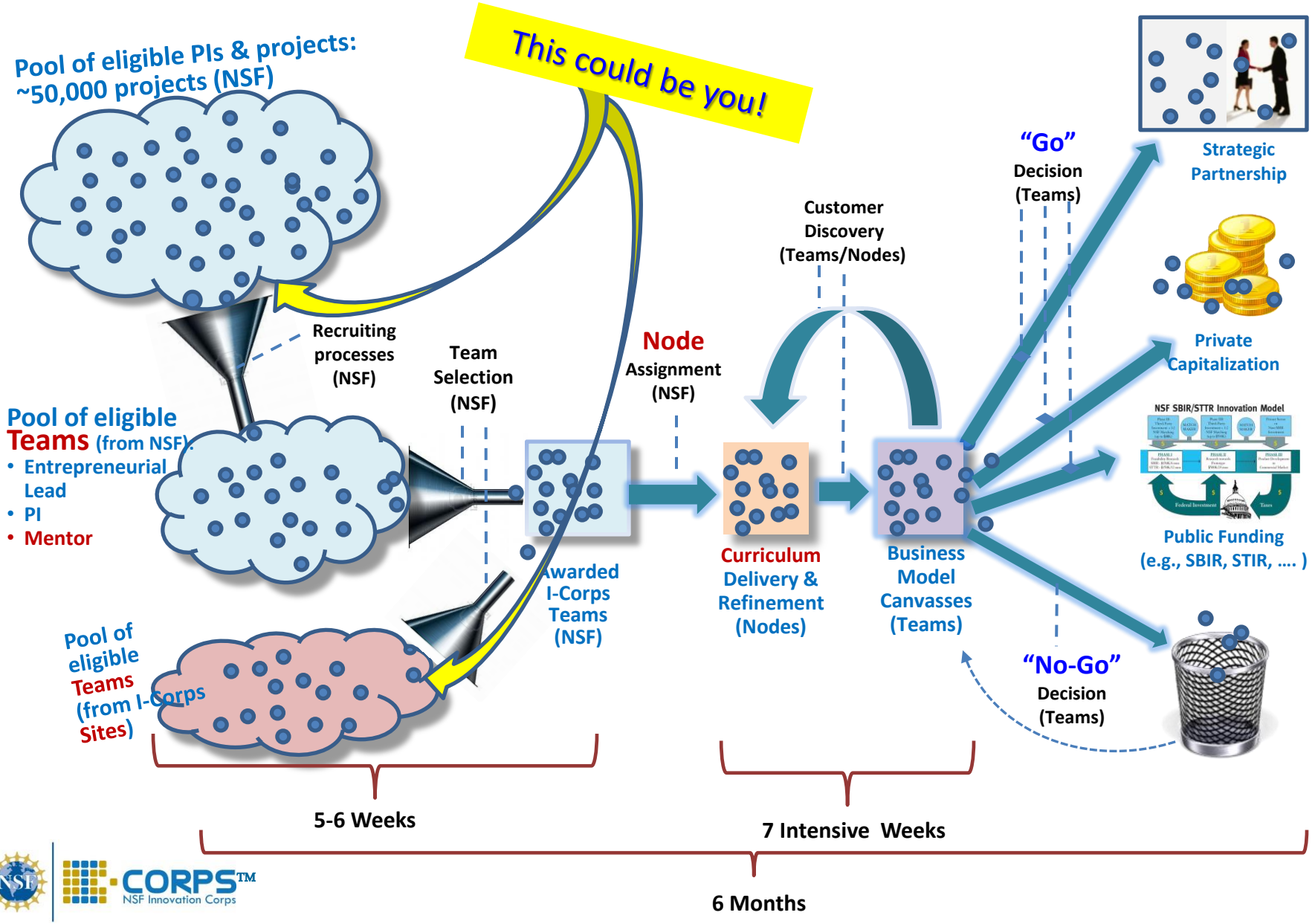
1. NSF's I-Corps Teams:

- NSF's I-Corps **Teams** Program funds teams of 3 people, where one is an NSF PI, one is an Entrepreneurial Lead, and one is a business Mentor, to commercialize an idea that had its origins in NSF-funded research.
- Awards are $50K/team.
- Teams are immersed in a seven week program based on lean start-up. I-Corps Teams funded ~600 teams from its beginning in 2011 until mid 2015.

2. NSF's I-Corps Mentors:

- NSF is sponsoring the creation of a national network of **Mentors** who are serial entrepreneurs and who volunteer to counsel and guide I-Corps Teams through the lean start-up process.

NSF Innovation-Corps Teams Flow Diagram



~600Teams completed I-Corps in past 4 years
>50% have already created start-up companies!!

Here are a few examples of I-Corps Team successes…

anchovilabs

New way to organize, browse and share your photos.

Acquired by Dropbox!

Developed software to annotate a large number of images quickly and accurately

Combining human input with an annotation algorithm
Facilitate image analysis

Founders

Serge Belongie
Professor at UC San Diego

Peter Welinder
Award-winning research in computer vision, machine learning and crowdsourcing.

Boris Babenko
Co-founder of @Anchovi Labs, Inc.

North Carolina A&T State University Crowned Champion in $100,000 ACC Clean Energy Challenge

Bioadhesive Alliance's winning technology, an environmentally friendly bio-based adhesive, is a sustainable alternative resource developed from the thermochemical liquefaction process converting swine manure to a bio-binder, while sequestering carbon and greenhouse gases otherwise released into the atmosphere.

… Bio-Adhesive Alliance was selected as the $25,000 grand prize winner. The start-up company is a spin-out from NC A&T State University that has developed an innovative technology to produce liquid asphalt from swine manure.

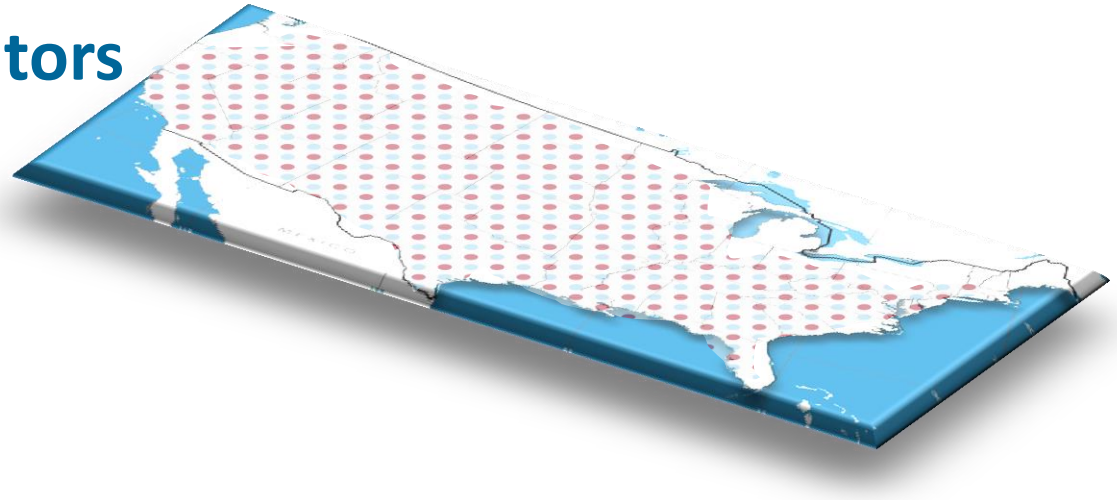
According to the company, "This technology provides a sustainable and cost-effective solution to swine manure treatment while reducing pavement construction and maintenance cost."

The Bio-Adhesive Alliance team completed the National Science Foundation's commercialization program known as I-Corps.

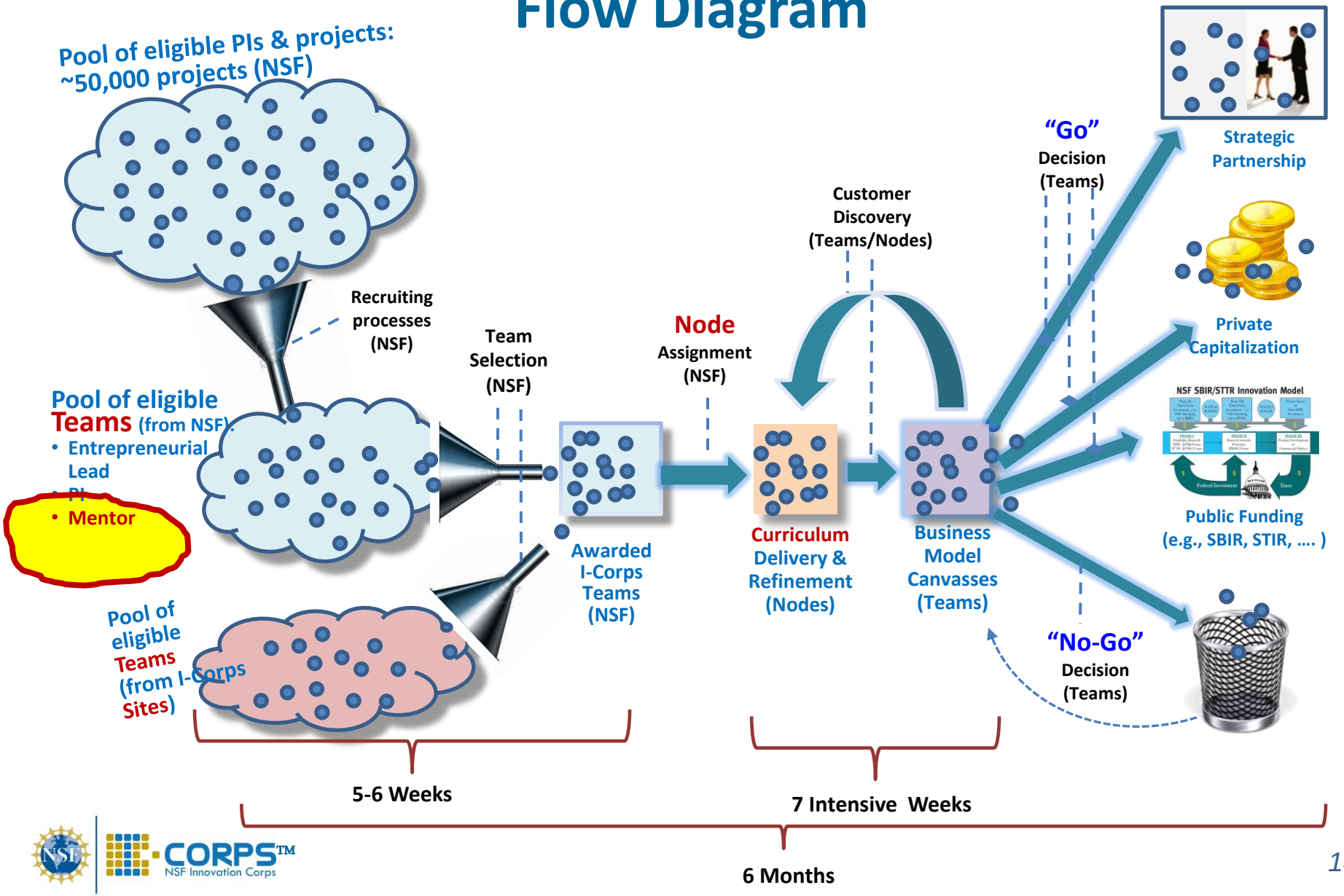
Bio-Adhesive Alliance

The I-Corps™ "National Resource Activity -- Mentors

I-Corps™ Mentors



NSF Innovation-Corps Flow Diagram



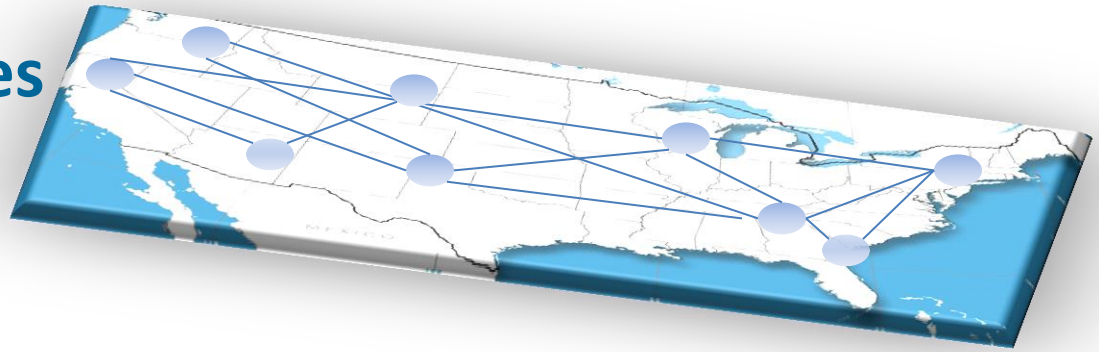
I-Corps™ Mentors

Mentor-Related Developments

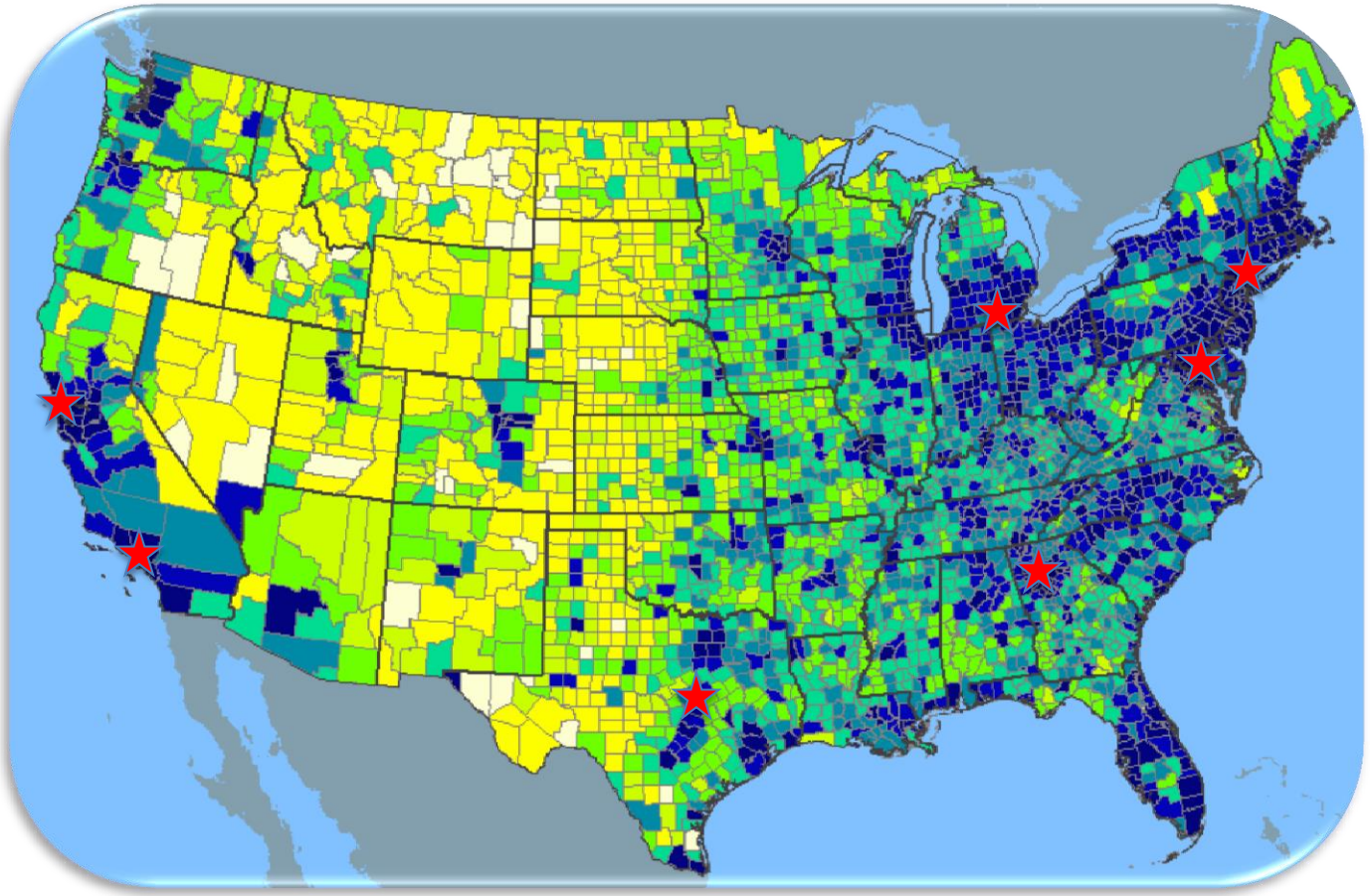
- LinkedIn
- ~500Mentors
- Re-cycling among Mentors!
- Mentor Focus-Session at Immersion-Curricula Venues
- DC/MD/VA Node: Developing Resources for Mentors and a National Mentors Network

The I-Corps™ "Regional Activity -- Nodes

I-Corps™ Nodes



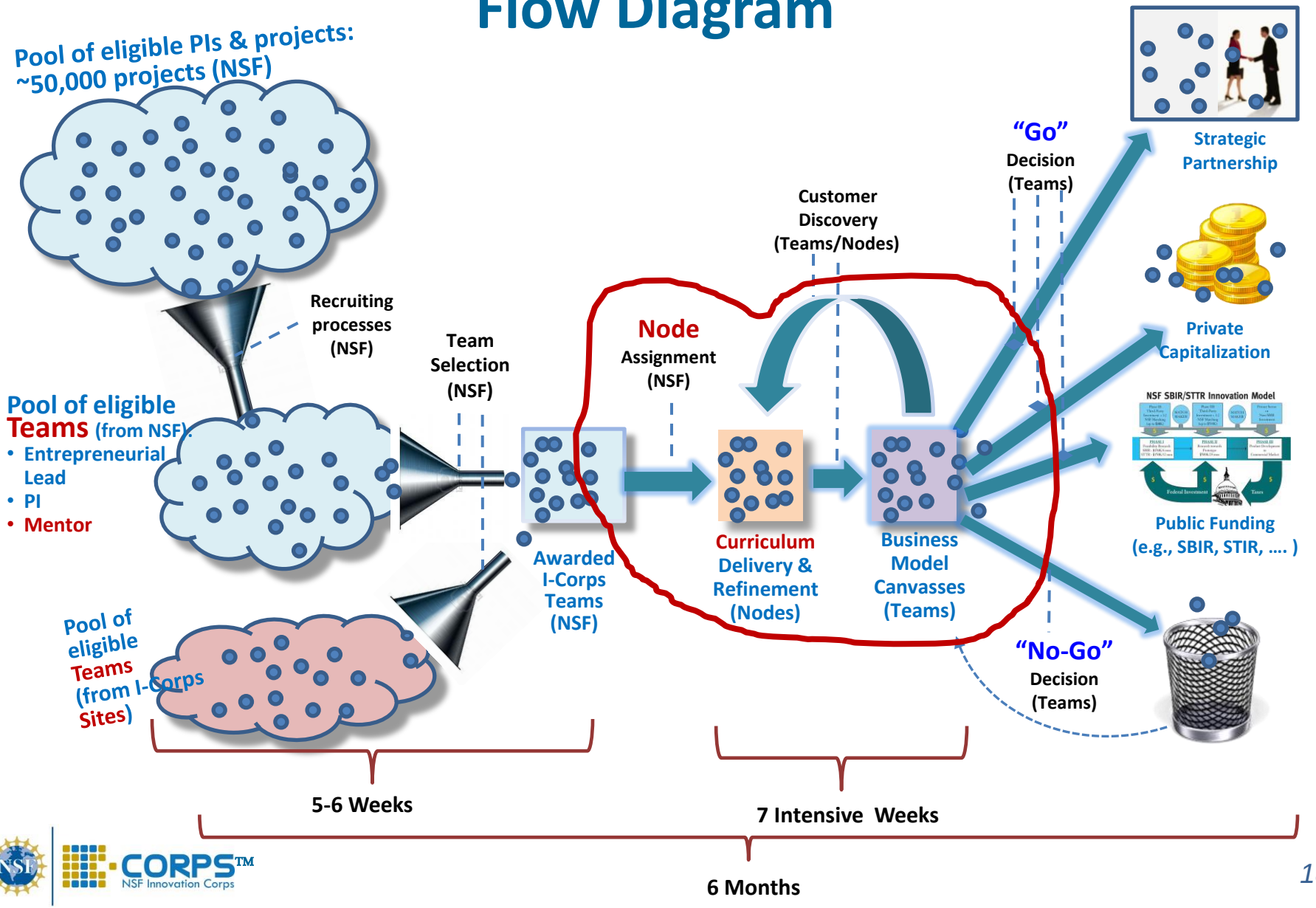
I-Corps™ Nodes



Level 1 – *Regional Training* + **Level 2 –** *Develop Tools and Resources* + **Level 3 –** *Blue Sky Research*

NSF I-CORPS™ NSF Innovation Corps

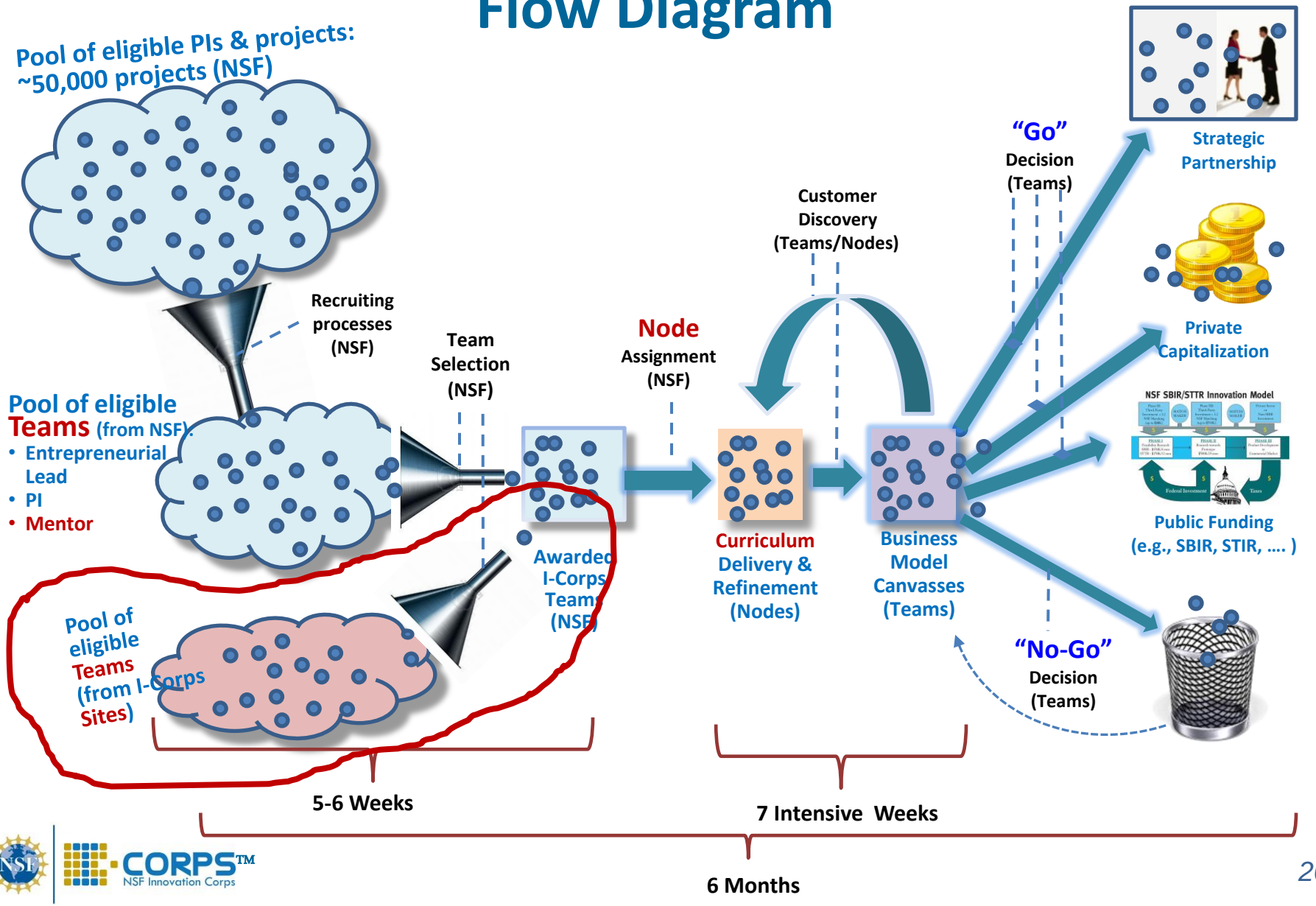
NSF Innovation-Corps Flow Diagram



The I-Corps™ Local Institutional-Level Activity -- Sites

I-Corps™ Sites

NSF Innovation-Corps Flow Diagram



I-Corps™ Sites

Motivation for I-Corps Sites Program:

- A need to **increase the pool** of potential NSF I-Corps Teams by supporting local teams whose projects are likely candidates for commercialization.
- **Leverage intellectual assets** of academic institutions and instill a **culture of entrepreneurship** in universities

Sites are funded at **single academic institutions**:

- with **already existing** innovation or entrepreneurial units,
- to enable them to **nurture teams** of students and/or faculty who are engaged in projects having the potential to be transitioned into the marketplace.

Sites can be **funded** up to $100,000/year for up to 3 yrs.

Sites provide:

- infrastructure, advice, resources, networking opportunities, training, and
- **modest funding** ($1,000 to $3,000 total to individual teams) to enable groups to transition their work into the marketplace or into becoming I-Corps Team. Approx. **30** teams per institution per year.

Sites can serve as "feeders" to produce I-Corps-eligible teams

I-Corps™ Sites

Year 1 – 4 Sites Awards:

- *University of Toledo*
- *UCSD*
- *University of Akron*
- *University of Illinois -- Urbana-Champaign*

Year 2 – 11 Sites Awards:

- *CMU*
- *MIT*
- *RIT*
- *San Diego State*
- *University of Southern Cal*
- *University of Central Florida*
- *University of Chicago*
- *University of Delaware*
- *University of Minnesota*
- *University of Texas – SA*
- *University of Utah*

Year 3 – 21 Sites Awards:

- Brigham Young University
- Howard and Hampton Universities
- Michigan Technological University
- New Jersey Institute of Technology
- Oregon State University
- Purdue University
- SUNY at Stony Brook
- Tulane University
- University of Alabama Tuscaloosa
- University of California-Los Angeles
- University of Connecticut
- University of Houston
- University of Iowa
- University of Louisville
- University of North Carolina at Charlotte
- University of Pennsylvania
- University of Pittsburgh
- University of Rochester
- University of South Florida
- University of Washington
- University of Wisconsin-Milwaukee

A couple of examples of Site innovations …

PhotoniCare

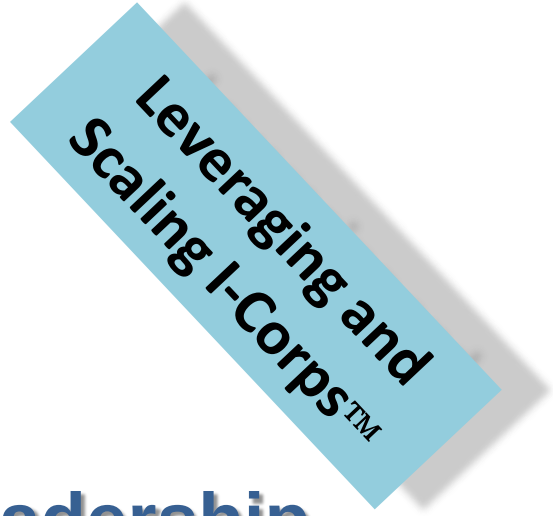
A new light on everyday health concerns

This project was developed at the University of Illinois which is one of NSF's **Innovation Corps Sites** – NSF's I-Corps Sites fund teams at universities to help them commercialize research.

This I-Corps Site Team developed an improved otoscope that enables physicians to quickly and accurately diagnose middle ear infections during routine examinations. In contrast to the traditional otoscope, *which hasn't changed in over a century since its inception*, the PhotoniCare CLEARVIEW™ allows the physician to look through the ear drum to directly observe and characterize effusions and biofilms responsible for infection in the middle ear.

Scaling to Other Federal Agencies

- ARPA-E
- USDA
- DHS
- NSA
- NIH
- …



States and Educational Leadership

- State Legislatures (NY, Ohio, CA, …)
- Academic Leadership
- National Sites Curriculum
- …

Thank you

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