



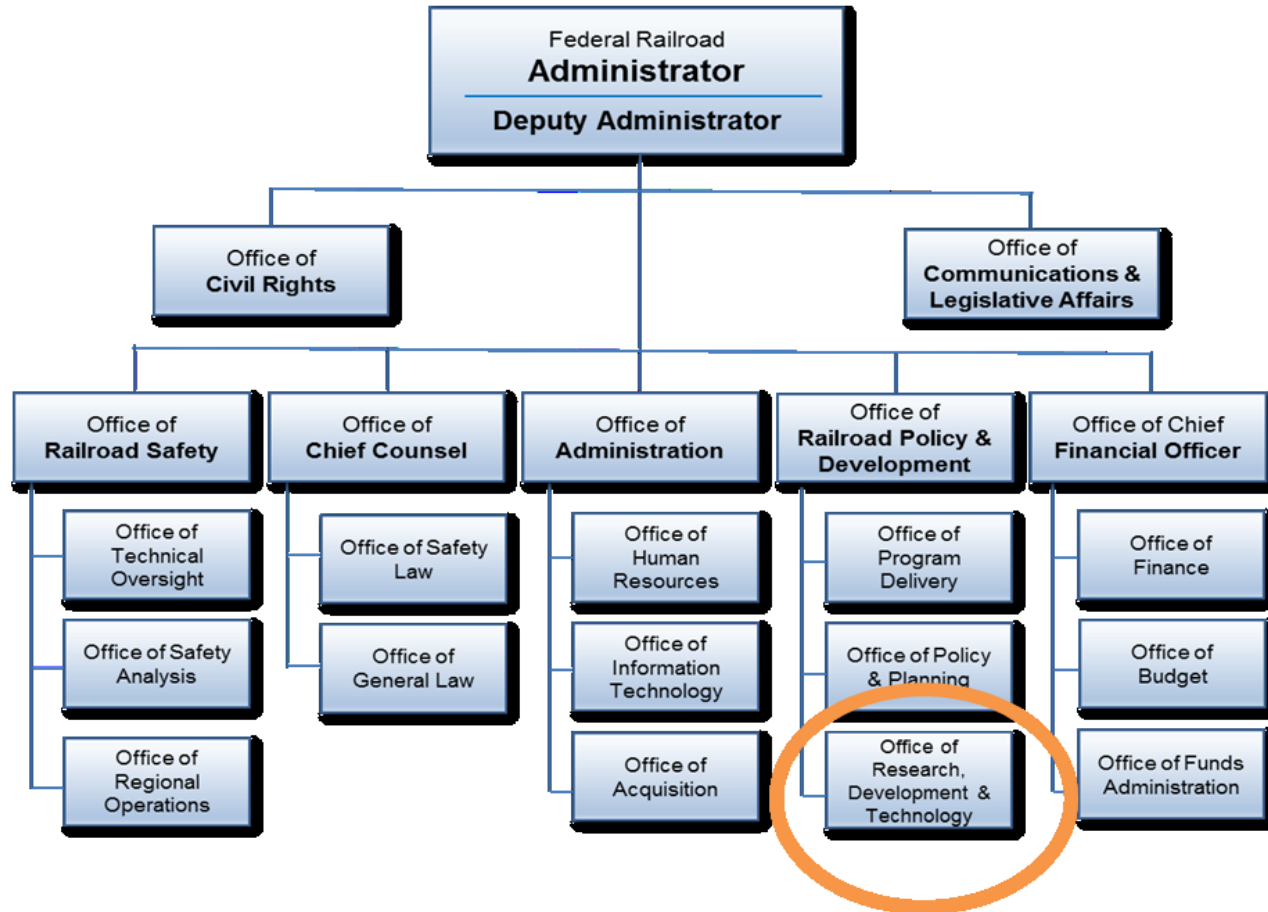
Federal Railroad Administration (FRA) Funding for Research Programs

Presented by:

Dr. Maryam Allahyar, Director of FRA's Office of Research, Development and Technology

Cameron Stuart • Jeff Gordon • Rachael Sack • Frances Bourne

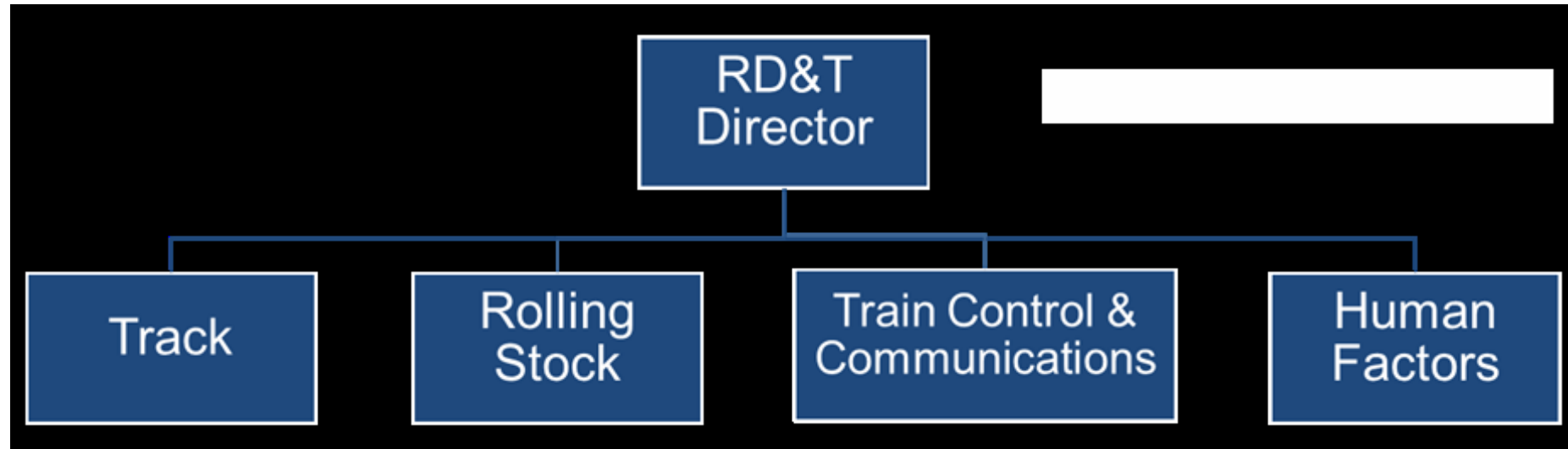
Federal Railroad Administration – Overview



FRA statistics:

- <1000 employees
- ~75% field/25% HQ
- Regulates over 700 railroads
- Annual research and development budget ~\$40 million

FRA Office of Research, Development and Technology (RD&T)



Mission: To ensure the safe, efficient, and reliable movement of people and goods by rail through applied research.

FRA Broad Agency Announcement (BAA) Research Programs

Presented by: *Cam Stuart, BAA Program Manager, Office of Research, Development and Technology*

Agenda

- What is a Broad Agency Announcement (BAA)?
- Why does FRA use the BAA process?
- General structure of FRA BAA programs
- Recent BAA program statistics

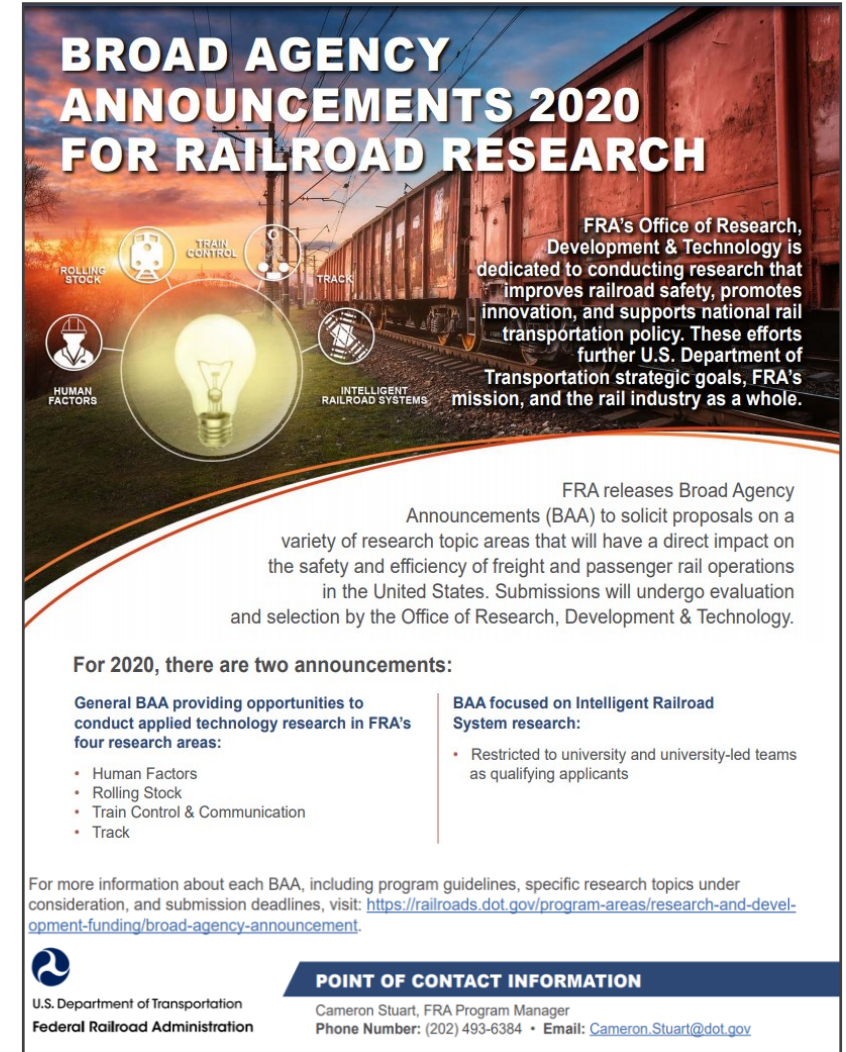
What Is a Broad Agency Announcement?

- A Broad Agency Announcement is a general announcement of an agency's intent to conduct or support **basic** or **applied** research.
 - Defined by the Federal Acquisition Regulation (FAR)
 - Not for development of specific products or systems
 - Only used when meaningful proposals with varying approaches are anticipated (FAR 35.016)
- A BAA contains:
 - A broad or specific description of research interest (generalized Statement of Work [SOW])
 - Proposal submittal schedule, instructions, and evaluation criteria



What Is a Broad Agency Announcement?

- The BAA is a **competitive**, open procurement process
 - FRA solicits research ideas
 - From the entire technical marketplace
 - That will directly impact the safety and efficiency of freight and passenger rail in the United States
- Awards can be contracts, grants, or co-ops
 - 100% of FRA awards have been contracts (fixed-price or cost type)
- Agency guidance/discussion occurs prior to formal proposal submittal (FAR 15.604)



BROAD AGENCY ANNOUNCEMENTS 2020 FOR RAILROAD RESEARCH

FRA's Office of Research, Development & Technology is dedicated to conducting research that improves railroad safety, promotes innovation, and supports national rail transportation policy. These efforts further U.S. Department of Transportation strategic goals, FRA's mission, and the rail industry as a whole.

FRA releases Broad Agency Announcements (BAA) to solicit proposals on a variety of research topic areas that will have a direct impact on the safety and efficiency of freight and passenger rail operations in the United States. Submissions will undergo evaluation and selection by the Office of Research, Development & Technology.

For 2020, there are two announcements:

<p>General BAA providing opportunities to conduct applied technology research in FRA's four research areas:</p> <ul style="list-style-type: none">• Human Factors• Rolling Stock• Train Control & Communication• Track	<p>BAA focused on Intelligent Railroad System research:</p> <ul style="list-style-type: none">• Restricted to university and university-led teams as qualifying applicants
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For more information about each BAA, including program guidelines, specific research topics under consideration, and submission deadlines, visit: <https://railroads.dot.gov/program-areas/research-and-development-funding/broad-agency-announcement>.

**U.S. Department of Transportation
Federal Railroad Administration**

POINT OF CONTACT INFORMATION
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Why Does FRA Use the BAA Process?

- Efficient method to solicit research
 - No detailed SOW needed
 - Short research topics!
 - Straightforward evaluation process
 - Guaranteed competition
- Targets tough challenges
 - Solutions are unknown
 - Generates creative approaches
 - Encourages new participants in railroad research



General Structure of FRA BAA Programs

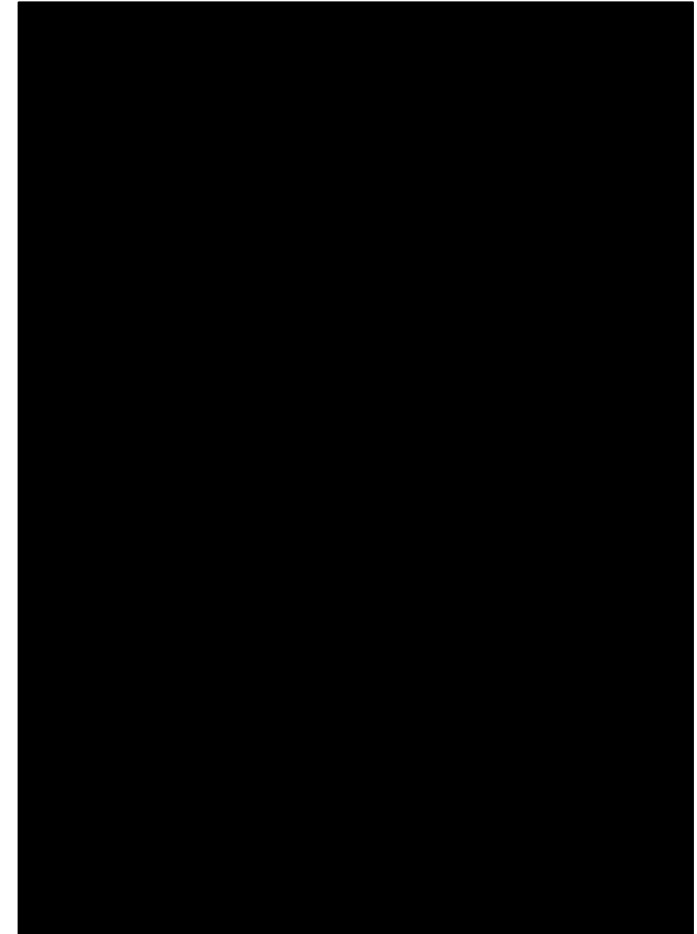
- **Documents:**

- BAA – contains strategic objectives and all requirements for participation in the program
- BAA “Appendix C” (most BAA programs) – separate set of specific research topics for response



Announcement to Award:
8 – 12 months

- **Announcement:** beta.sam.gov
- **Eligibility:** open, except for university-only programs
- **Two-phase process**
 - Concept papers – 5 pages, 2-month open period
 - Proposals – by invitation, up to 20 pages
- **Evaluations:** all by federal employees
- **Award size (general):** \$150K – \$1M



Recent BAA Statistics

High-Speed Intercity Passenger Rail (HSIPR) BAA

FY 2011–2013

Funding
\$30
million

60+
awards

Annual Research BAA

FY 2013–Present

Funding is variable from annual allocations to RD&T divisions

100+
awards

Intelligent Railroad Systems BAA

*FY 2018, 2020**

**Open until June 26, 2020*

University or university-led teams only

\$1 million
per year
FY 2017–2020

3
awards to date

University Research BAA

FY 2019

\$2 million
for university/
university-led
teams only

Proposal
evaluations
completing
June 2020

Other Questions

- Process after project is funded?
- How to get on distribution lists for programs?
- How to learn about solicitations for research ideas?*



- Do applicants receive feedback, whether project is funded or not?
- How to keep in touch with project progress?
- What happens after research is completed?

Small Business Innovation Research (SBIR) Program

Presented by:

Jeff Gordon, SBIR Program Manager, Office of Research, Development and Technology (FRA)

Rachael Sack, USDOT SBIR Program Director, Volpe National Transportation Systems Center



U.S. Department of Transportation
Federal Railroad Administration

Agenda

1. What is the Small Business Innovation Research (SBIR) Program?
2. Who is eligible and how is a project selected?
3. How does FRA select its topics?
4. How can I learn more?

SBIR Overview

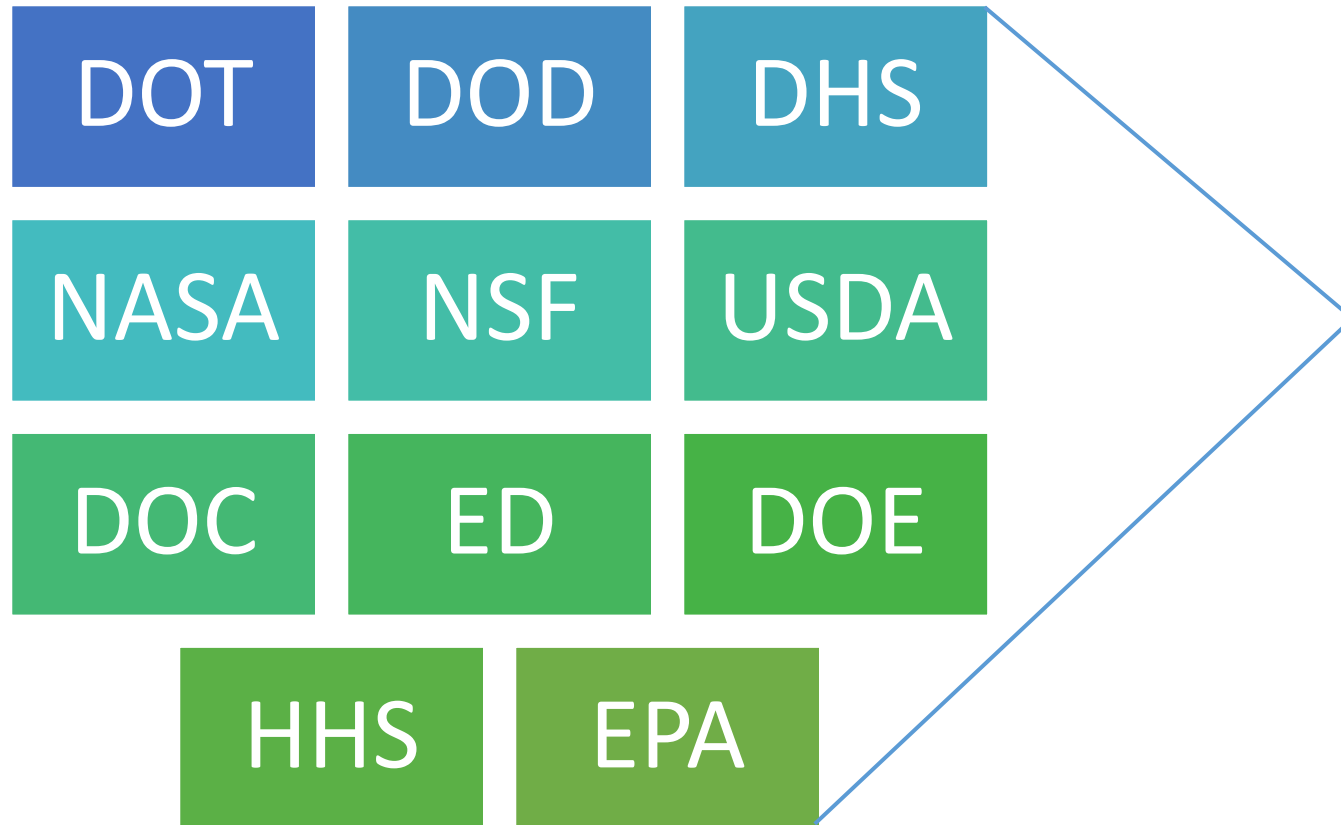
Congress established the SBIR Program* in 1982 to:

- Meet federal **research and development (R&D) needs**
- Increase private-sector **commercialization** of innovation derived from federal research and development funding
- Stimulate technological **innovation**
- Foster and encourage **participation** in innovation and entrepreneurship by women and socially/economically disadvantaged individuals

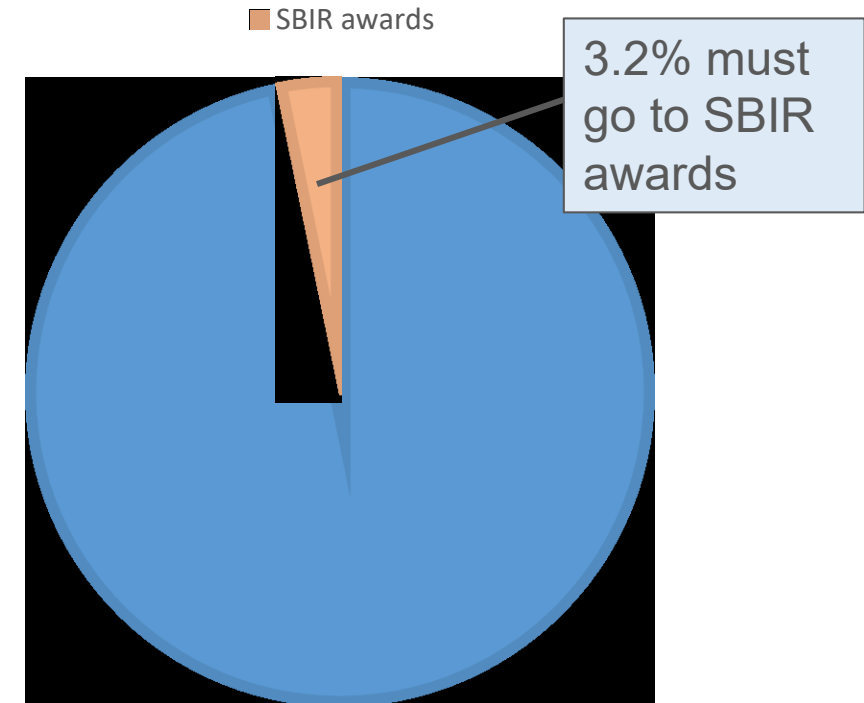
*<https://www.sbir.gov/>

SBIR Overview

Federal Agencies with Extramural Research Budgets > \$100 Million



EXTRAMURAL RESEARCH BUDGET



U.S. DOT's SBIR Program

- SBIR addresses high-priority research gaps within DOT's R&D program
- SBIR topics are developed to align with the Secretary's strategic priorities, specific modal priorities, and the Small Business Administration (SBA)

DOT Operating Administrations Participating in SBIR

Federal Aviation Administration (voluntary)

Federal Highway Administration / ITS Joint Program Office

Federal Railroad Administration

Federal Transit Administration

Federal Motor Carrier Safety Administration

National Highway Traffic Safety Administration

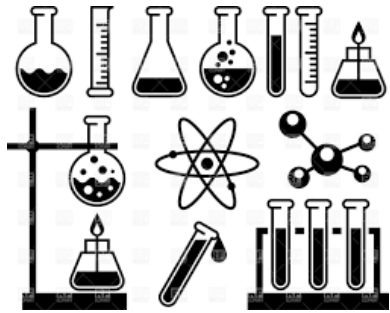
Office of the Secretary

Pipeline and Hazardous Materials Safety Administration

Eligibility

- Applicants from industry must be for-profit, U.S.-owned and -operated companies employing under 500 people
- Focus is on performing R&D, *not* purchasing equipment, commercializing a technology that has already been developed, or one that has very low risk and only needs capital
- For DOT's SBIR program, applicants cannot be venture capital operating companies (VCOCs), hedge funds, or private equity firms

Eligibility



- More than one-half of the principal investigator's employment time is spent working for the small business. This typically precludes full-time employment with another organization.



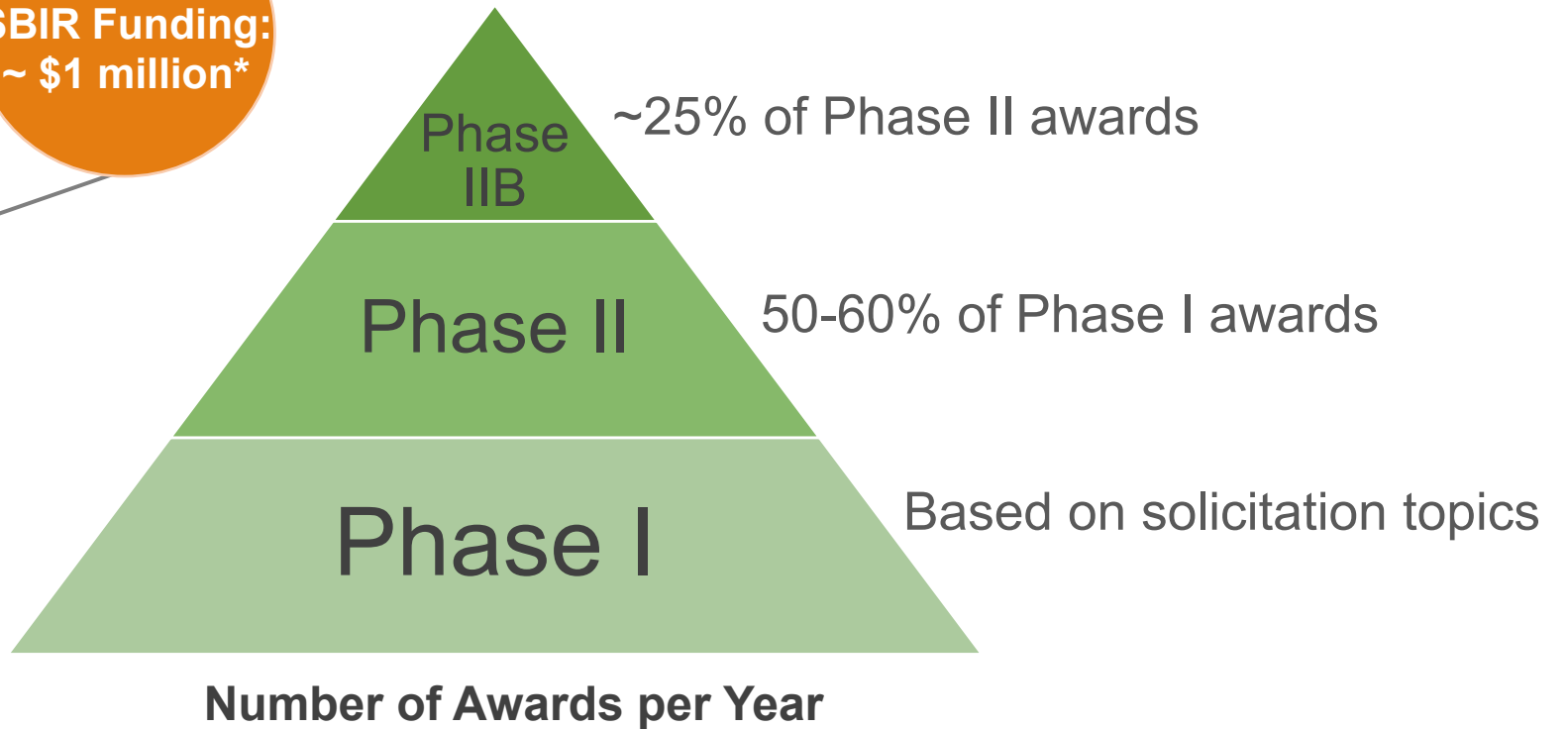
- The research or R&D work must be performed in the United States (with few exceptions) for Phase I, II, and IIB

U.S. DOT's SBIR Program Details

Annual SBIR Budget: \$9 million

Annual FRA SBIR Funding: ~ \$1 million*

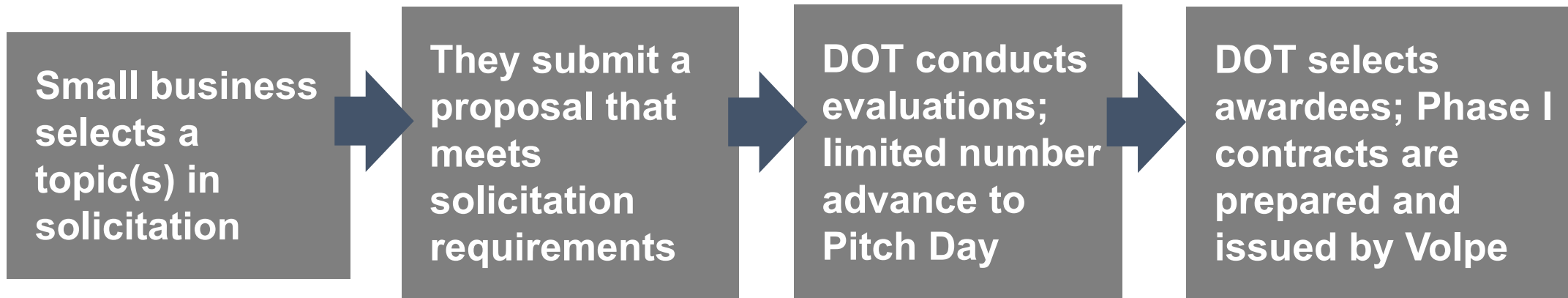
- Approx. 5 to 10 topics per year
- 12 topics in FY20 (4 from FRA)



*May include additional funding when available and necessary

Three-Phase Process

Solicitation to Award Process



FRA's RD&T Program and SBIR Topic Areas

As mentioned, FRA's RD&T Office is organized into four divisions:

Track

- Track and Structures
- Track and Train Interaction
- Facilities and Equipment

Rolling Stock

- Passenger & Freight Equipment and Components
- Hazardous Materials
- Train Occupant Protection

Train Control & Communications

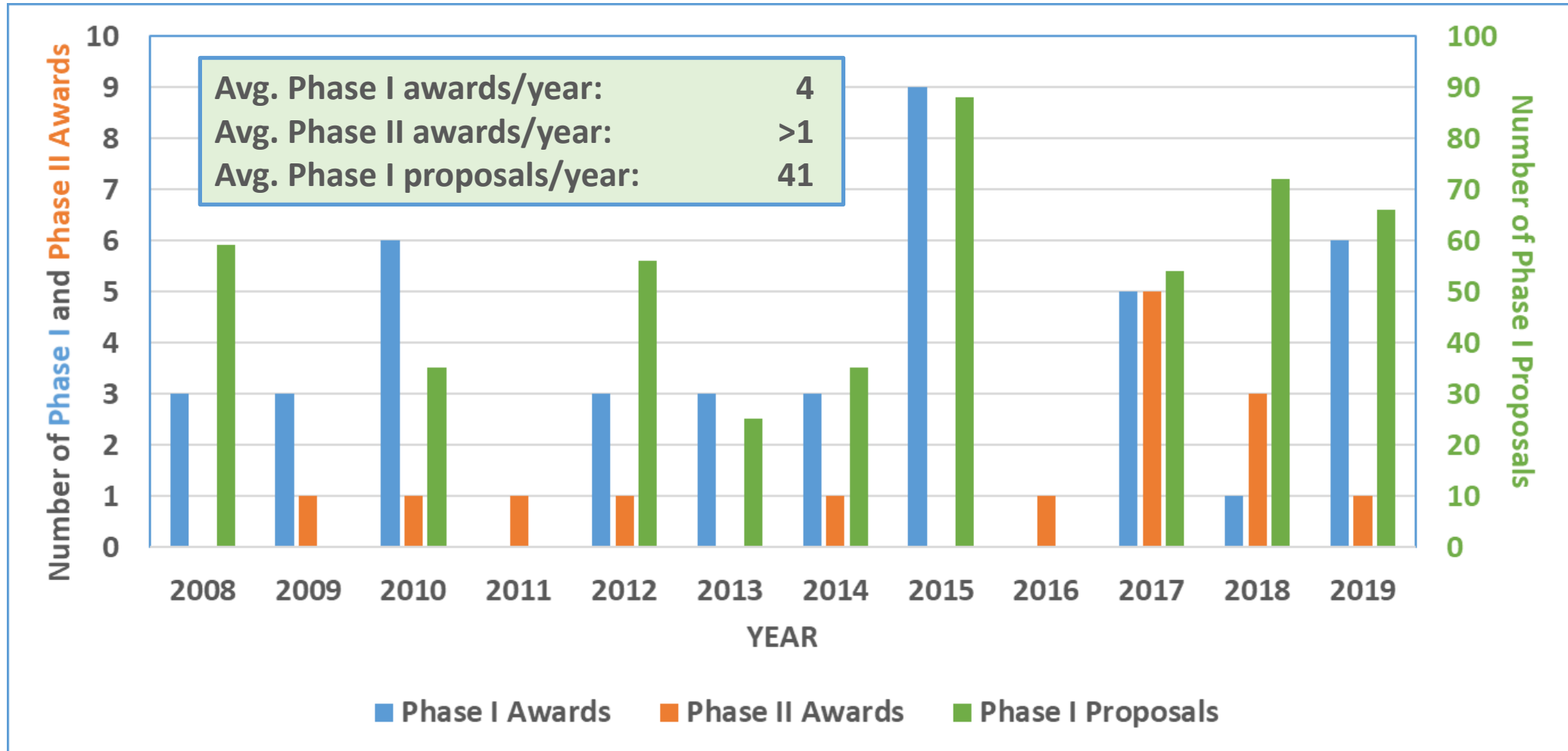
- Train Control & Communications (e.g., PTC)
- Grade Crossing and Trespasser Accident Prevention

Human Factors

- Improve organizational safety culture in railroad organizations
- Conduct research on fatigue, distraction and ergonomics
- Develop technology, automation and systems design to minimize human error

See: <https://railroads.dot.gov/research-development/research-development-technology>

FRA's SBIR Participation History



FY20 FRA SBIR Topics

- Autonomous Track Inspection Technology
- AI-Aided Machine Vision for Grade Crossing Safety
- Platform Edge Proximity Detection to Prevent Inadvertent Passenger Car Door Opening
- Crushed Aggregate Gradation Evaluation System



Current FRA SBIR Topics with Awards

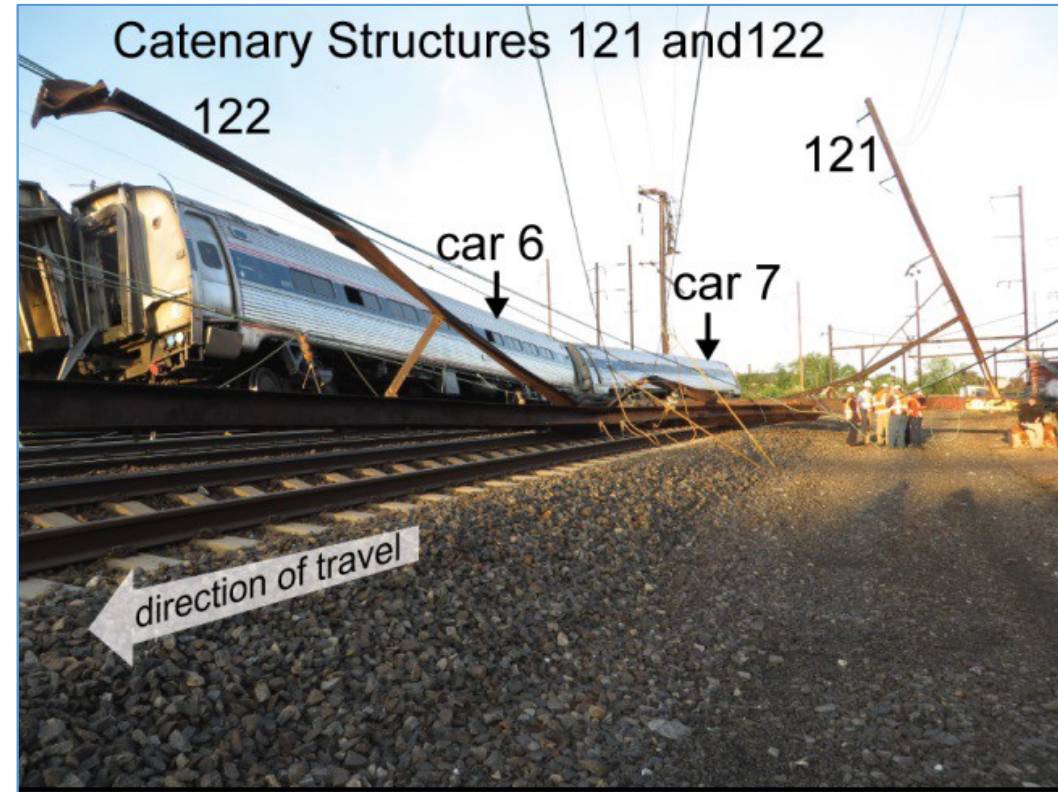


Sample of Active Contracts

- Broken Rail Detection from Flashing Rear End Device
- Drone-Based Track Safety Inspection System
- Portable Stiffness/Elastic Modulus Measurement System
- Improved Condition Monitoring of Traction Motors
- Automated, Drone-Based Grade Crossing Inspection

Ongoing Phase IIB SBIR Related to Train Occupant Protection

Resilient Wayside Structures and Passenger Car Survivability



SBIR Success Story

A Safer Way to Access Freight Locomotives



Agency: **Federal Railroad Administration**

Company: **GS Engineering, Inc.**

Product: **Easy Access to Freight Locomotives**

With support from the U.S. DOT SBIR program and the Federal Railroad Administration (FRA), GS Engineering, Inc. developed and tested a system that makes accessing freight locomotives easier and safer for railroad engineers and workers...continue

reading.



Photo credit: GS Engineering, Inc.

For more SBIR success stories, visit:

<https://www.volpe.dot.gov/work-with-us/small-business-innovation-research/sbir-success-stories>

Other Things to Know about SBIR

- **One solicitation** per year
- Next solicitation expected **winter 2020-2021**
 - Sign up to receive notifications of when topics are posted, as well as solicitation open and close dates at www.volpe.dot.gov/sbir
- SBIR administers **contracts**, not grants
- SBIR Program Office does not accept **unsolicited proposals**

Other Questions

- Process after project is funded?
- Do applicants receive feedback, whether project is funded or not?
- What happens after research is completed?

Contact

- For more information about FRA's Research, Development and Technology Program, contact:

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- For more information about the DOT's SBIR Program visit www.volpe.dot.gov/sbir or contact:

DOT SBIR Program Office

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Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program

Presented by: *Frances Bourne, Lead Transportation Industry Analyst, Office of Policy and Planning*

CRISI Program Overview

Grant Purpose

- To fund projects that improve the safety, efficiency, and/or reliability of intercity passenger and freight rail systems

CRISI – Recent & Upcoming Funding Opportunities

Authorization & Appropriations (M)

	FY16	FY17	FY18	FY19	FY20
Authorization	\$98	\$190	\$230	\$255	\$330
Appropriation	—	\$68	\$592.5	\$255	\$325

Status of Funding Opportunities

Year	Available Funding (M)	Status	
FY17	\$65	<input checked="" type="checkbox"/>	Awards announced February 2019
FY18 (PTC)	\$250	<input checked="" type="checkbox"/>	Awards announced August and December 2018
FY18	\$318	<input checked="" type="checkbox"/>	Awards announced June 2019
FY19	\$244	<input checked="" type="checkbox"/>	Awards announced March 12, 2020
FY20	\$311	<input type="checkbox"/>	NOFO published April 20, 2020; app. due June 19, 2020

CRISI Program Overview

Eligible Applicants

- State entities
- Public agencies or publicly chartered authorities
- Local governments
- Amtrak or other intercity passenger rail carrier
- Class II or III railroads
- Any rail carrier or equipment manufacturer in partnership with at least one state entity, public agency, and/or local government
- **The Transportation Research Board (TRB)**
- **A university transportation center engaged in rail-related research**
- A non-profit labor organization

CRISI Program Overview

Eligible Project Criteria

- **Wide Range of Rail Capital Projects**
 - Congestion mitigation
 - Ridership growth facilitation
 - Enhancements to multimodal connections
 - Improvements to short-line or regional railroad infrastructure
- **Railroad Safety Technology**
- **Track, Station, and Equipment Improvements for Intercity Passenger Rail**
- **Grade Crossing Improvements**
- **Rail Line Relocation and Improvement**
- **Regional, State, Corridor Planning and Environmental Analyses**
- **Safety Programs and Institutes**
- **Research, Workforce Development, and Training**

At least 25% of funds is reserved for rural projects

\$45M is set aside for new intercity passenger rail route right-of-way acquisition, track, or track structure projects

CRISI Program Overview

- Primarily a capital project improvement program
- Cost-sharing grants and co-ops for infrastructure and research
 - Non-federal match: 20% minimum; preference for 50% or more
- Four tracks
 - **Track 1:** Planning
 - **Track 2:** Preliminary Engineering / National Environmental Policy Act review
 - **Track 3:** Final Design/Construction
 - **Track 4:** Research, Safety Programs, and Institutes
- Active 2017 – current

iv. Track 4—Research, Safety Programs and Institutes (Non-Railroad Infrastructure)
Track 4 consists of projects not falling within Tracks 1–3 and for the development and implementation of workforce development activities, research, safety programs or institutes designed to improve rail safety that clearly demonstrate the expected positive impact on rail safety. Sufficient detail must be provided on what the project will accomplish, as well as the applicant’s capability to achieve the proposed outcomes. Examples include: Initiatives for improving rail safety, training, public outreach, and education.

2018 Grant Selections

Rural Railroad Safety Center

Kansas State University

Award: Up to \$2,574,365

- Kansas State University will lead development of Rural Railroad Safety Center with partner institutions:
 - University of Nebraska, Lincoln
 - University of Florida
 - Pennsylvania State University, Altoona
 - California State University, Chico
- Project will provide railroad industry workforce development and safety research

Florida Strategies for Reducing Railway Trespassing

Florida Department of Transportation

Award: Up to \$157,683

Pilot program using drone technology, closed-circuit television with remote monitoring, and geographic information system spatial analysis to aid partnerships among local law enforcement agencies to combat trespassing in Volusia, Seminole, Orange and Osceola counties.

Mobile Device Emergency Responder Access Application

Louisville and Indiana Railroad Company

Award: Up to \$335,361

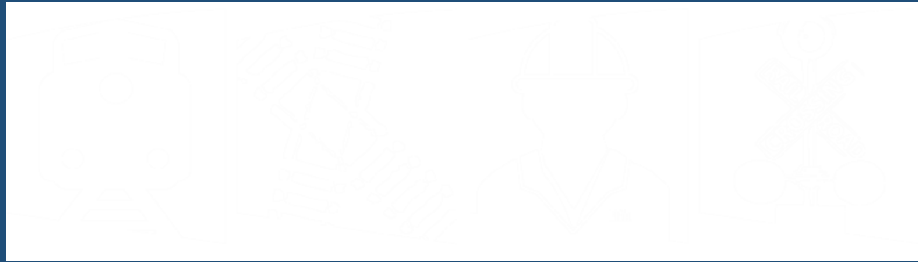
- Develops a geographic information system mobile application for the Louisville and Indiana Railroad Company with software, linking railroad dispatch and first responders and aiding communication and response during railroad incidents
- Collaborators:
 - The American Short Line and Regional Railroad Association
 - The Short Line Safety Institute

More Information about the FY20 CRISI Program

- FY20 CRISI Program NOFO:
 - <https://www.federalregister.gov/documents/2020/04/20/2020-08226/notice-of-funding-opportunity-for-consolidated-rail-infrastructure-and-safety-improvements>
- FY20 CRISI Grants NOFO Webinar:
 - <https://railroads.dot.gov/rail-network-development/training-guidance/webinars>



Q&A



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