



Pipeline and Hazardous Materials Safety Administration Office of Pipeline Safety

PHMSA's Research & Development Program & Hydrogen Safety

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Statutory Authorities



- The Fixing America's Surface Transportation (FAST) Act of 2015
- The Protecting Our Infrastructure of Pipelines and Enhancing Safety (PIPES) Act of 2020



U.S. DOT Strategic Pillars



Pipeline Safety Research Program Mission

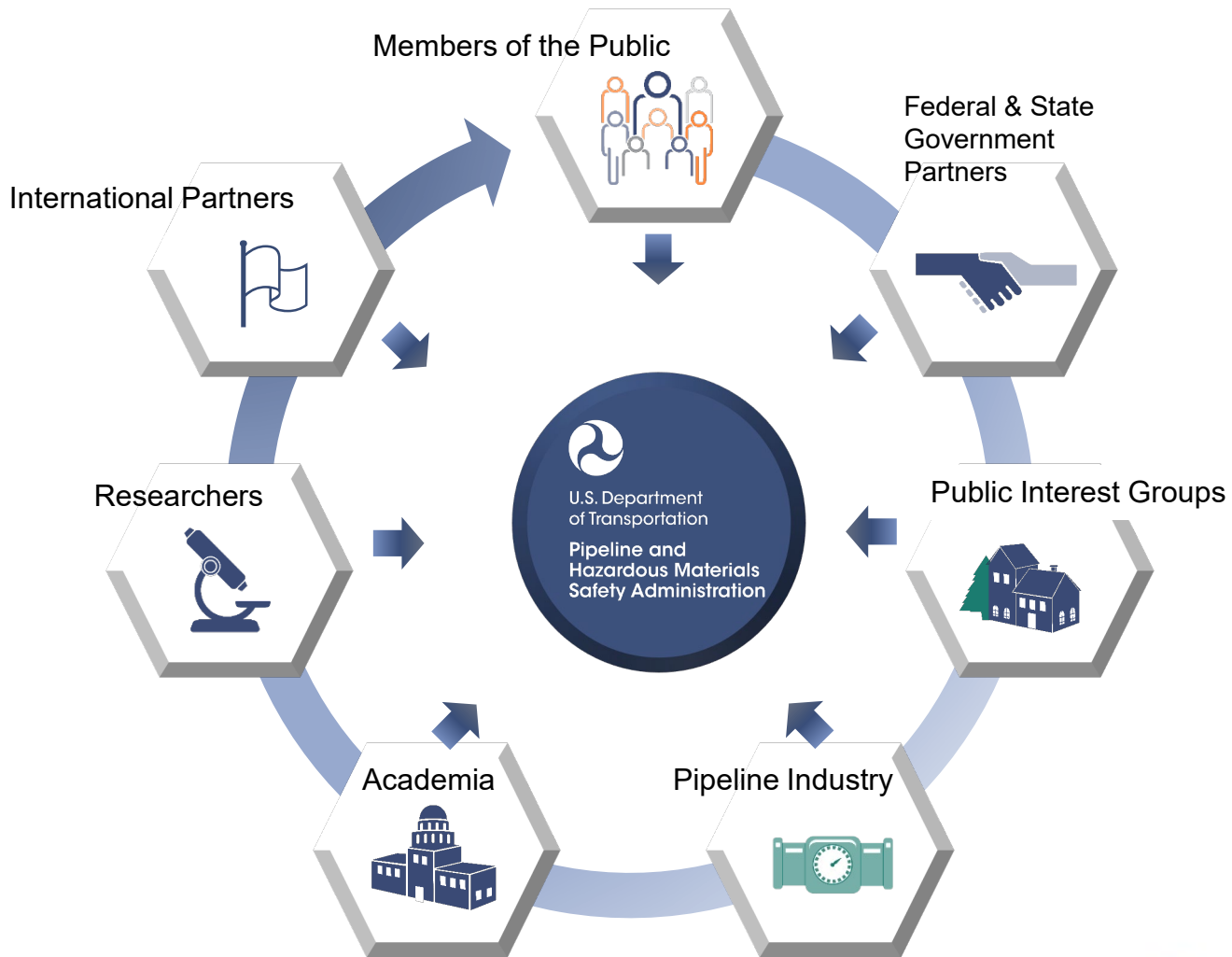
To sponsor research and development projects focused on providing **near-term solutions** for the Nation's pipeline transportation system that will improve **safety**, reduce **environmental impact**, and enhance **reliability**.



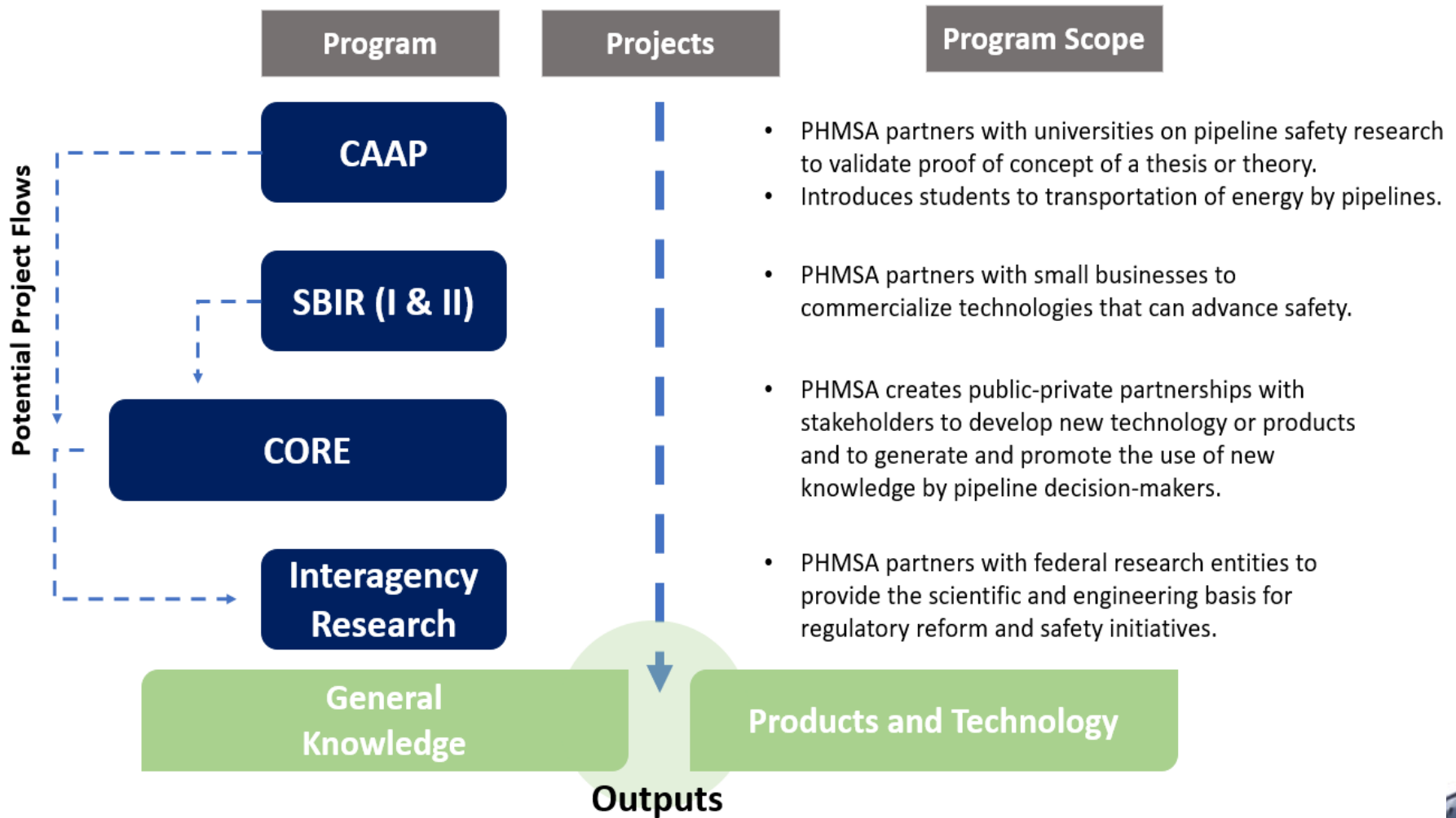
Research Program Strategy Development



Collaboration Partners



Research & Development Program



Total Investment History Since 2002



Name	Amount	Number of Projects
Core	\$128.5 M	252 Projects
CAAP*	\$15.1 M	61 Projects
SBIR	\$15.8 M	48 Projects
IAA	\$7.4 M	19 Projects
Total	\$166.8 M	380 Projects

*CAAP launched in 2013



Performance History Since 2002

Technology

Category	Technology Projects	Technology Demonstrations	Patent Applications (U.S. + Other)	Patents Granted (U.S. + Other)	Tech-Transfer/Commercialized Technologies	PHMSA (\$M)	Cost Share (\$M)
Threat Prevention	25	16	3	3	5	\$12.57M	\$12.73M
Leak Detection	17	12	2	0	6	\$ 9.39M	\$ 7.02M
Anomaly Detection	44	33	25	9	16	\$30.28M	\$30.87M
Anomaly Characterization	9	3	0	0	1	\$ 4.32M	\$ 2.80M
Anomaly Repair	1	0	0	0	0	\$ 0.99M	\$0.00
Materials	10	2	3	2	1	\$11.15M	\$ 7.98M
Welding/Joining	10	7	1	1	0	\$6.27M	\$7.48M
Alternative Fuels	3	2	1	1	2	\$ 1.09M	\$ 0.56M
Underground Natural Gas Storage	2	1	0	0	0	\$ 0.99M	\$ 0.99M
Totals:	121	76	35	16	33	\$77.10M	\$70.48M

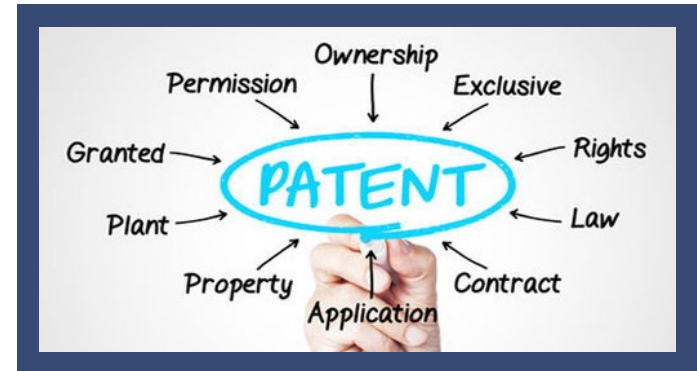
Data as of 10/1/2021



Performance History Since 2002

Knowledge Development/Dissemination

Website Metric	Measure
Total Hits	41,178,605
Average Hits/Month	185,489
Downloads Since 2008	2,016,763



Knowledge Promotion Metric	Count
Final Reports	265
Conference or Journal Papers	237
Public Events	44
Annual Peer Reviews Held	14

Data as of 10/1/2021



FY 2022 Research Focus



PSRP FY22 Program Areas

Alternative Fuels Research to Address Climate Change Solutions

PHMSA will invest in research gaps that enhance the safe transportation of hydrogen gas and/or for various hydrogen blends in the nation's pipeline network.

Pipeline Leak Detection

PHMSA will invest in research gaps identified during the Spring 2021 Leak Detection public meeting as well as technologies identified to address Sections 113 and 114 of the PIPES Act of 2020.

Liquefied Natural (LNG) Gas Safety

PHMSA will invest in the development of new technologies and alternative designs for LNG storage and piping systems. Research will also address performance-based risk reduction for construction, operations, maintenance of LNG facilities.

Underground Natural Gas Storage (UGS) Facilities Safety

PHMSA will invest in improving the integrity of surface wellheads and UGS facilities, thereby mitigating the risk of natural gas releases into the environment.



PSRP FY22 Program Areas (cont.)

Pipeline Anomaly Detection/Characterization

PHMSA will invest in the development of new or improved tools, technology, and assessment processes to identify and locate critical pipeline defects and to improve characterization of their severity.

Repair/Rehabilitation

PHMSA will invest in the development of enhanced repair materials, techniques, processes, tools, and/or technology.

Pipeline Threat Prevention

PHMSA will invest in the development of new or improved tools and technology to aid in the prevention and reduction of damage to pipelines, thereby enhancing safety and preventing or limiting methane releases into the environment.



PHMSA Priorities



Equity



- Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.
- Technology solutions to rehabilitate aging infrastructure in underserved populations; engagement with interagency partners.
- Pursue R&D projects that will advance equity through execution and/or findings.



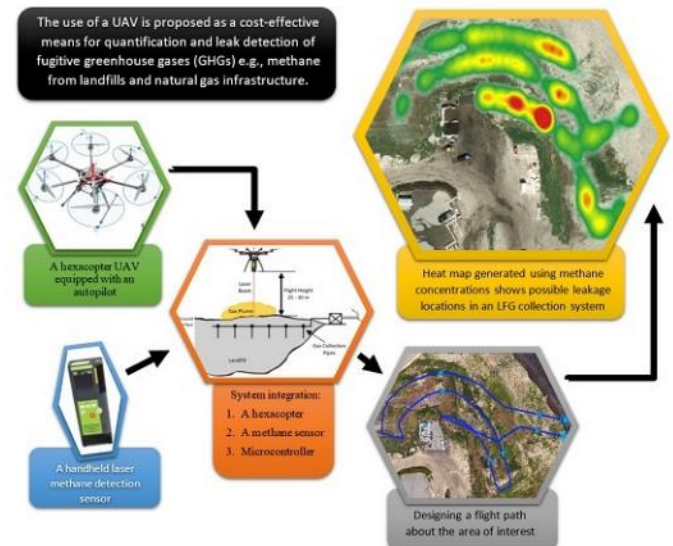
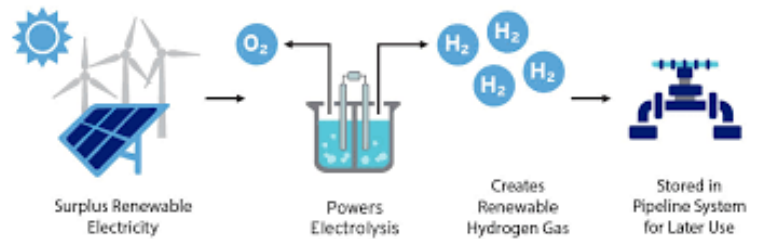
Methane Mitigation

- Executive Order 14008, Tackling the Climate Crisis at Home and Abroad
- DOT Justice 40 Initiative
- PIPES Act of 2020 congressional mandates focused on mitigate methane leaks to include:
 - Section 113 – Natural Gas pipeline leak detection and repair minimum performance standards
 - Section 114(d) – Report outlining best available technologies to minimize releases to the environment
- Pursue R&D that can limit potential climate impacts from PHMSA regulated infrastructure.



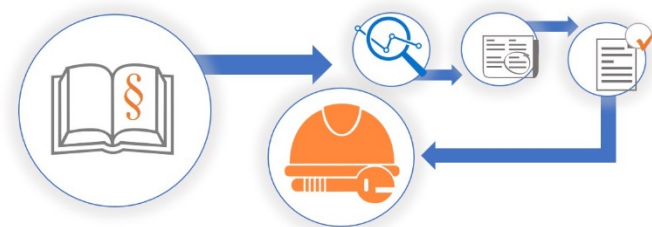
Emerging Fuels

- Executive Order 14008, Tackling the Climate Crisis at Home and Abroad
- Emerging fuels increase energy security, reduce emissions, improve vehicle performance, and stimulate the U.S. economy



Hydrogen Safety

- PHMSA regulates the safety of Hydrogen gas pipelines under 49 CFR Part 192
- Hydrogen gas pipelines total less than 1,600 miles nationally
- Hydrogen research gaps exist in:
 - Underground storage for Hydrogen
 - Hydrogen network components
 - In-line inspection tools



Thank You

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