U.S. Department of Transportation

BUDGET ESTIMATES

FISCAL YEAR 2022

PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION

SUBMITTED FOR THE USE OF
THE COMMITTEE ON APPROPRIATIONS

U.S. DEPARTMENT OF TRANSPORTATION

PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION

FY 2022 BUDGET REQUEST

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U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
FY 2022 ADMINISTRATOR'S OVERVIEW

For its FY 2022 Budget, The Pipeline and Hazardous Materials Safety Administration (PHMSA) **requests $310.1 million** to operate a world-class safety organization. PHMSA's request supports the Secretary's priorities of **safety, equity in transportation and energy systems, protecting the environment, responding to the adverse impacts of climate change, and economic growth**. Working closely with Congress, we will continue the focus on improved safety standards in the recently enacted Protecting Our Infrastructure of Pipelines and Enhancing Safety (PIPES) Act of 2020 with new investments in the regulatory framework, added safety inspectors to ensure the highest safety standards, and investments to attract and retain the best and brightest safety engineers.

Following are highlights of PHMSA's FY22 Budget request:

- **$11.9 million unfunded PIPES Act of 2020 mandates (Pipeline Safety)—**
  - $6.2 million **to complete the 36 new congressional mandates in PIPES Act of 2020 (**expedited rulemakings; increased inspections; additional reviews, studies, and reports to Congress);
  - $3.9 million in baseline increases including the remaining cost to **add 8 regulatory positions to complete safety mandates**; and
  - $1.8 million to **add 17 inspection and enforcement staff to required PIPES Act of 2020** levels and to **complete safety checks for pipeline operators** protecting the environment from spills/incidents.
  - All of which will **strengthen pipeline safety nationally and reduce climate and environmental impacts**. This will enable PHMSA to **advance the President's climate change agenda** by **reducing methane emissions** in the oil/gas sector and mitigate environmental damage from spills and incidents.

- **$3.5 million State Hazardous Materials Inspection Program (Hazardous Materials Safety)—** to conduct state-based **safety inspections of hazardous materials shippers**, which will leverage state resources to **improve safety of hazardous materials transport** and **reduce fatalities/injuries**. As the number of hazardous materials shipments continue to increase year-over-year (projected 44% increase in non-electric vehicle lithium-ion batteries, and 37% in electric vehicle batteries by 2025), there is a much greater demand to ensure safe transport—this additional funding will allow states and localities to keep up with demand.

- **$2.2 million Hazardous Materials Planning Outreach (Hazardous Materials Safety)—** for 20 positions to **address economic inequity and reduce transportation costs** through Hazardous Materials Planning Outreach to **economically disadvantaged communities**. Through the Emergency Preparedness grants program, PHMSA will outreach to Local Emergency Planning Communities (LPECs), which are often in economically distressed areas, allowing them to make better and safer decisions about managing hazardous materials transportation risk, thereby keeping communities safer.

- **$3.0 million Research & Development (Pipeline Safety)—** to restore Pipeline Safety Research and Development to pre-FY 2021 levels. This will allow PHMSA to focus on **innovative, transformational pipeline safety research**, including in the areas of **cleaner fuel alternatives** such as hydrogen.

PHMSA is responsible for the registration and safety standards for more than 40,000 companies transporting regulated hazardous materials and the expansive 2.8-million-mile U.S. pipeline network that moves more than 16 billion barrels of oil, hazardous liquids, and natural gas safely. Given the aging pipeline network, often in disadvantaged communities, it will be critical to focus on modernization efforts, which will also allow for the flow of climate-friendly fuels such as hydrogen.

PHMSA also is responsible for the safe transport of energy products and other hazardous materials, by air, highway, rail, and water. These products annually account for more than 2.7 billion tons of regulated hazardous products transported with a value of more than $3.1 trillion.

PHMSA's grant programs provide states, localities, and non-profits with the support they need to inspect pipelines, train first responders, and ensure those often-underserved communities most impacted by pipelines and hazardous material routes are not adversely impacted. PHMSA's research answers complex safety questions and develops needed safety technology that helps mitigate climate impacts. The regulatory framework, inspections, grants, and research converge to preserve our environment and our underserved communities from harm.

PHMSA's FY 2022 budget request is largely funded by the industries we regulate: User fees from hazardous materials shippers and pipeline operators, in addition to the Oil Spill Liability Trust fund, make up 70 percent of PHMSA's funding request, while the remainder is sourced from the general fund. This request includes:

- **$182.7 million** for **Pipeline Safety**,
- **$98.3 million** for **Hazardous Materials Safety**, and **Emergency Preparedness Grants**,
- **$29.1 million** to fund the **Operational Expenses** account.

Following is a programmatic summary of PHMSA's FY22 Budget request:

$182.7 million for Pipeline Safety consisting of 224 inspection and enforcement staff, including an additional 8 additional regulatory staff, and 105 safety professionals. Important Pipeline Safety investments include:

- **$101.1 million for operations** including fulfilling the **36 new mandates from the PIPES Act**, and completing safety reviews for new Liquefied Natural Gas (LNG) export facilities. This funding supports the collection and analysis of data to inform safety standards, and training for Federal and state inspection and enforcement staff. These funds also support PHMSA's efforts to **increase communication with those impacted by pipelines, particularly in underserved communities**, as well as support excavation damage prevention efforts, and assist PHMSA in the review of special permits and approvals.

- **$66.6 million for grant programs** that fund the important state pipeline inspections and damage prevention work. PHMSA provides grants to states to support inspection and enforcement activities of the nation's vast network of intrastate pipelines, including pipelines that operate in cities and neighborhoods, especially underserved communities. This includes the **State Pipeline Safety Grants ($58.0 million)**, **Underground Natural Storage Grants ($6.0 million)**, **State Damage Prevention Grants ($1.5 million)**, and **State One-Call Grants ($1.1 million)**.

- **$15.0 million for research** including developing failsafe delivery systems that preserve the environment as America moves to cleaner and renewable energy sources. Pipeline Safety research will **focus on incidents caused by corrosion, material failure, and equipment failure**, which cause 55% of all pipeline incidents; as well as **a focus on containment of greenhouse gases (such as methane), transportation of alternative fuels including hydrogen, and improved leak detection**.

$98.3 million[1] for Hazardous Materials Safety and **Emergency Preparedness Grants** including the existing 95 regional inspectors and outreach staff, and 128 safety professionals. The request includes 20 new outreach staff to respond to the rise in e-commerce deliveries, biomedical waste and supply shipping, and renewables such as lithium-ion batteries. Important Hazardous Materials Safety investments include:

- **$60.3 million for operations,** including increasing demand for **lithium-ion battery transportation, including new demand for electric vehicle batteries**. This also funds staff that work with COVID-19-response sectors to ensure safe transportation of medical supplies, hand sanitizers, and dangerous goods such as chlorine and other toxic chemicals. Included in this amount is **funding for the new Hazardous Materials Planning Outreach initiative** listed above.

- **$30.5 million for grants** to first responders and local governments faced with hazardous materials routes near their homes and businesses. These grants support **training of first responders, train-the-trainer programs, and safety training for incident response**. This funding **supports the training of over 100,000 emergency responders annually**.

- **$7.6 million for research,** including work in cooperation with the US Census Bureau to **identify changes in hazardous materials commodity flow** volumes and patterns, supporting innovation in packaging, and enhancing shipping methods. One area of focus is **innovative packaging for lithium-ion batteries**, which will improve their safe transport.

$29.1 million for Operational Expenses including 68 safety professionals working to improve safe deliveries by all modes of transportation including pipeline. Important investments include:

- **Continuing an investment in leadership development** by **building a cadre of safety leaders** for PHMSA in FY 2022 and beyond via new and existing agency-wide leadership development programs. The agency has already successfully delivered both advanced and intermediate leadership development programs and is launching a beginner program.

[1] Component totals may not add up due to rounding.

- **Developing recruitment and retention programs** to ensure that PHMSA can **attract and retain the highest-quality safety professionals**. The PIPES Act directs PHMSA to provide recruitment and retention incentives such as tuition reimbursement, student loan repayment and special pay rates. PHMSA is focusing on standing up these critical programs**.**

- **Emergency Response (ER) Grants ($2.5 million) and Information Grants to Communities ($2.0 million).** The ER grants program provides funding to State, county, and local governments in **high consequence areas for emergency response management, training, and technical assistance**. Approximately 80 percent of rural fire departments do not have formal emergency response training. This program will close that gap. The Information Grants to Communities provides **critical outreach and technical assistance to communities impacted by pipelines**. Key services include awareness campaigns such as "811 Call Before You Dig."

This request will help PHMSA protect the environment, respond to the adverse impacts of climate change, and promote economic growth through the safe and efficient transport of pipeline products and hazardous materials.

AMERICAN JOBS PLAN: BUILD WORLD-CLASS TRANSPORTATION INFRASTRUCTURE: FIX HIGHWAYS, REBUILD BRIDGES, AND UPGRADE PORTS, AIRPORTS, RAIL AND TRANSIT SYSTEMS

President Biden is calling on Congress to make a historic and overdue investment in our roads, bridges, rail, ports, airports, and transit systems. The President's plan will ensure that these investments produce good-quality jobs with strong labor standards, prevailing wages, and a free and fair choice to join a union and bargain collectively. These investments will advance racial equity by providing better jobs and better transportation options to underserved communities. These investments also will extend opportunities to small businesses to participate in the design, construction, and manufacturing of new infrastructure and component parts. President Biden's plan will deliver infrastructure Americans can trust, because it will be more resilient to floods, fires, storms, and other threats, and not fragile in the face of these increasing risks.

The President's plan invests an additional $621 billion in transportation infrastructure and resilience:

- Within this amount, **$540 Billion** would reside in the Department of Transportation for its programs allocated over a five-year period, and is in addition to the base amounts included in the FY 2022 Budget request.

- Separately, the American Jobs Plan also provides $50 billion make our infrastructure more resilient of which **$7.5 Billion** would be provided to the Department of Transportation.

- Aside from Department of Transportation funding, the American Jobs Plan calls for **$74 Billion** in additional infrastructure investments, including $8 Billion to the U.S. Army Corps of Engineers for Inland Waterways and Harbor Projects, $3 Billion to the General Services Administration for land ports of entry, $20 Billion to the Environmental Protection Agency for school bus electrification, and $43B for non-transportation resilience programs.

Detailed information about the American Jobs Plan can be found within the FY 2022 Budget Highlights located at:

https://www.transportation.gov/mission/budget/fiscal-year-2022-budget-highlights

SURFACE TRANSPORTATION REAUTHORIZATION

The President's vision for addressing our Transportation Safety and Infrastructure needs relies on three building blocks:

The FY 2022 Budget

First, the FY 2022 President's Budget provides discretionary and mandatory funding in core programs to continue the current portfolio of transportation programs and includes targeted funding elements to address the Administration's current priorities particularly in the transit and rail areas.

Surface Transportation Reauthorization

The President's plan also recognizes that the current surface authorization act – Fixing America's Surface Transportation Act (FAST Act) – expires this fiscal year. Since Congress is now considering multi-year legislation that would begin in FY 2022, the budget displays flat levels equal to the last year of the FAST Act for simplicity. **This is not a policy decision that the next reauthorization should equal FAST ACT levels, but rather a technical presentation to ensure consistency between the American Jobs Plan (AJP) and the traditional DOT accounts.** Surface authorization acts have traditionally provided mandatory funding for highway, transit, and safety programs from excise tax revenue deposited into the Highway Trust Fund (HTF). Additionally, surface authorization acts establish certain programs that Congress funds through the annual appropriations process. For example, the FAST Act was the first time a rail title was included in a multi-year surface reauthorization package.

American Jobs Plan

Finally, the $621 billion in investments proposed in the American Jobs Plan represent investments in addition to the base amounts included in the FY 2022 President's Budget request.

The FY 2022 Budget request reflects the American Jobs Plan funding as budget authority provided over five years. Funding is grouped in nine new program accounts that align with the major portions of the AJP, but funding is not assigned to specific DOT Budget Accounts.

The President's FY 2022 request does not include a formal legislative reauthorization proposal. Rather, the President's Budget documents present key Administration reauthorization principles, which align with the foundation of the AJP. These include:

- Safety
- Equitable Economic Strength and Improving Core Assets
- Ensuring Investments Meet Racial Equity and Economic Inclusion Goals
- Resilience and Addressing Climate Change
- Transformation of our Nation's Transportation Infrastructure

To reflect this, the FY 2022 President's Budget shows flat funding of contract authority in current Highway Trust Fund accounts throughout the full 10-year Budget window. These flat-line levels do not represent funding or program design recommendations by the Administration. When the Congress takes up the AJP and Surface Transportation reauthorization, the Administration looks forward to working collaboratively with Congress to infuse its key principles and policy proposals into legislation, and to add additional funding and policy proposals proposed in the American Jobs Plan. The Administration seeks to work with Congress to reflect the American Jobs Plan and key principles in legislative measures to advance ambitious investments in infrastructure, including surface transportation reauthorization.

How does this impact programs not impacted by AJP goals?

For other programs that receive discretionary appropriations and mandatory programs unaffected by surface authorization, the FY 2022 Budget presents detailed information consistent with DOT's prior budget requests.

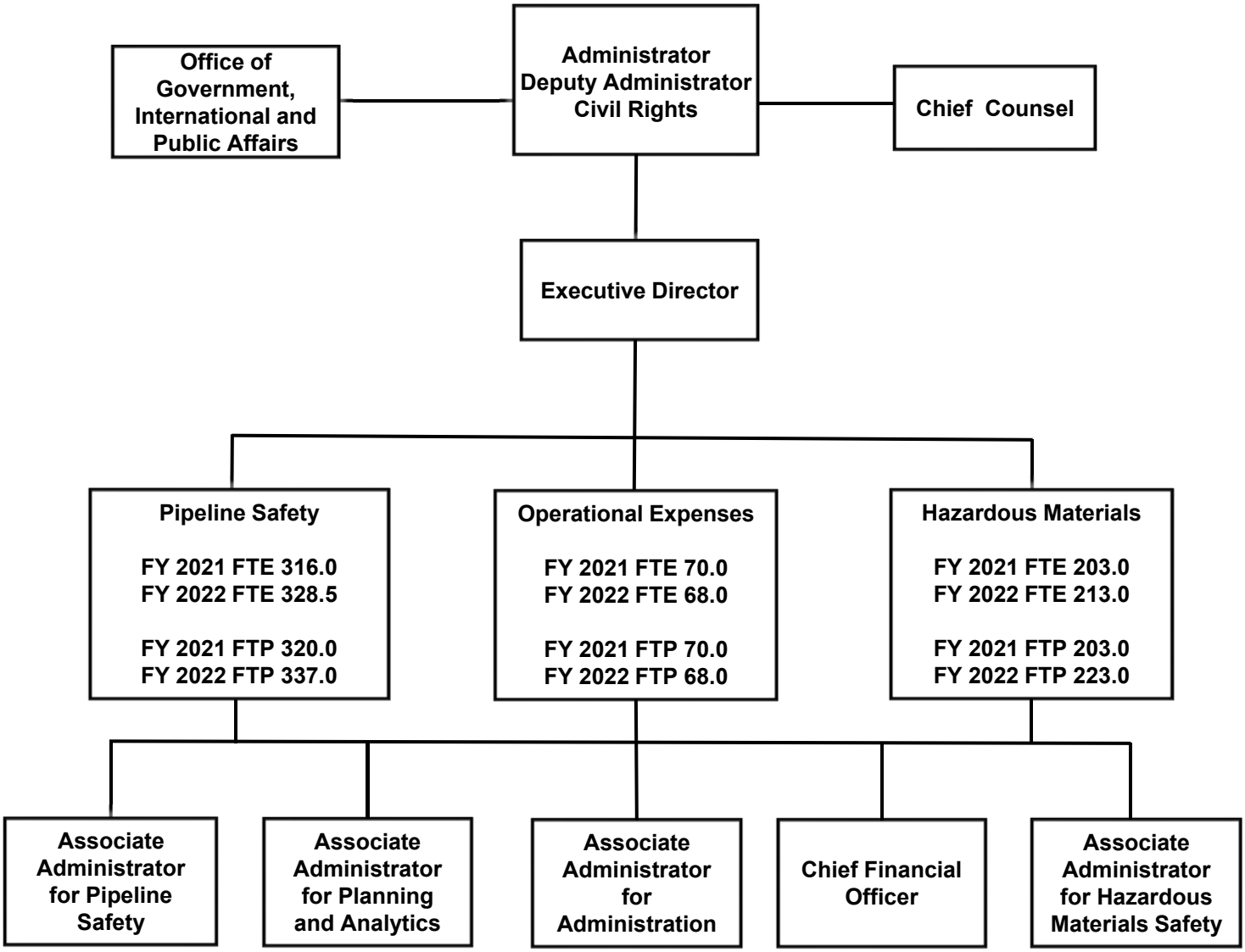
JUSTICE40

Executive Order 14008, issued on January 27, 2021, created a government-wide "Justice40" Initiative with the goal of delivering 40 percent of the overall benefits of relevant federal investments to disadvantaged communities and tracking performance toward the goal through an Environmental Justice Scorecard.

The Justice40 Initiative has the potential to deliver benefits that could include increased access to renewable energy and energy efficiency improvements, public transit, water infrastructure, climate-resilient affordable housing, training and workforce development, reductions in legacy pollution, and equitable and just community development, among others. There are important considerations in the development, implementation, and evaluation of such a wide-reaching and complex initiative. To advance Justice40 goals the Department is considering options in areas such as, but not limited to, incorporating criteria in the Department's discretionary grant programs, developing implementable definitions for "investment benefit" and "disadvantaged communities" as it relates to programmatic activities, public engagement strategies with stakeholders to define and further understand "investment benefits" that can be targeted for disadvantaged and underserved communities, and developing a Department-wide Environmental Justice Scorecard.

In the coming months, the Department will be working to ensure that subsequent programs, targets, and metrics fulfill the ambition of the Justice40 Initiative to deliver meaningful and measurable benefits to disadvantaged and underserved communities.

Exhibit I: Pipeline and Hazardous Materials Safety Administration (PHMSA)
Full-Time Equivalents (FTE) and Full-Time Positions (FTP) for
FY 2021 President's Budget and FY 2022 Request
FTE Totals: FY 2021 Enacted – 589.0 / FY 2022 Request – 609.5
FTP Totals: FY 2021 Enacted – 593.0 / FY 2022 Request – 628.0



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II: Budget Summary Tables

EXHIBIT II-1
FY 2022 BUDGET AUTHORITY
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
($000)

ACCOUNT NAME	M / D	(A) FY 2020 ACTUAL	(B) FY 2020 CARES Act	(C) FY 2021 ENACTED	(D) FY 2021 CRRSA	(E) FY 2021 American Rescue Plan	(F) FY 2022 PRESIDENT'S BUDGET
Pipeline Safety							
Pipeline Safety Fund	D	137,000	-	137,000	-	-	146,600
Underground Natural Gas Storage Fund	D	8,000	-	8,000	-	-	8,000
Liquefied Natural Gas Siting Fund	D	-	-	-	-	-	400
Oil Spill Liability Trust Fund	D	23,000	-	23,000	-	-	27,650
Subtotal		**$ 168,000**	**$ -**	**$ 168,000**	**$ -**	**$ -**	**$ 182,650**
Hazardous Materials Safety							
General Fund	D	61,000	-	62,000	-	-	69,029
Subtotal		**$ 61,000**	**$ -**	**$ 62,000**	**$ -**	**$ -**	**$ 69,029**
Emergency Preparedness Grants							
Emergency Preparedness Fund (Mandatory) /1	M	26,647	-	27,704	-	-	27,687
Emergency Preparedness Fund (Discretionary)	D	-	-	1,000	-	-	1,000
Subtotal		**$ 26,647**	**$ -**	**$ 28,704**	**$ -**	**$ -**	**$ 28,687**
Operational Expenses							
General Fund	D	24,215	-	28,715	-	-	29,100
Subtotal		**$ 24,215**	**$ -**	**$ 28,715**	**$ -**	**$ -**	**$ 29,100**
TOTALS		**$ 279,862**	**$ -**	**$ 287,419**	**$ -**	**$ -**	**$ 309,466**
Gross New Budget Authority		**$ 279,862**	**$ -**	**$ 287,419**	**$ -**	**$ -**	**$ 309,466**
Rescissions		-	-	-	-	-	-
Transfers		-	-	-	-	-	-
Offsets		**(145,000)**	-	**(145,000)**	-	-	**(154,600)**
NET NEW BUDGET AUTHORITY:		**$ 134,862**	**$ -**	**$ 142,419**	**$ -**	**$ -**	**$ 154,866**
[Mandatory BA]		**26,647**	-	**27,704**	-	-	**27,687**
[Discretionary BA]		**$ 108,215**	**$ -**	**$ 114,715**	**$ -**	**$ -**	**$ 127,179**

1/ Estimate of Annual Registartion fees collected

EXHIBIT II-2
FY 2022 TOTAL BUDGETARY RESOURCES BY APPROPRIATION ACCOUNT
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

ACCOUNT NAME	M / D	(A) FY 2020 ACTUAL	(B) FY 2020 CARES ACT	(C) FY 2021 ENACTED	(D) FY 2021 CRRSA	(E) FY 2021 American Rescue Plan	(F) FY 2022 PRESIDENT'S BUDGET	
Pipeline Safety		**$ 168,000**	**$ -**	**$ 168,000**	**$ -**	**$ -**	**$ 182,650**	
Pipeline Safety Fund	D	137,000	-	137,000	-	-	146,600	
Underground Natural Gas Storage Fund	D	8,000	-	8,000	-	-	8,000	
Liquefied Natural Gas Siting Fund	D	-	-	-	-	-	400	
Oil Spill Liability Trust Fund	D	23,000	-	23,000	-	-	27,650	
Hazardous Materials Safety		**$ 61,000**	**$ -**	**$ 62,000**	**$ -**	**$ -**	**$ 69,029**	
General Fund	D	61,000	-	62,000	-	-	69,029	
Emergency Preparedness Grants		**$ 28,318**	**$ -**	**$ 29,318**	**$ -**	**$ -**	**$ 29,318**	
Emergency Preparedness Fund	M	28,318	-	28,318	-	-	28,318	**/1**
Emergency Preparedness Fund (General Fund)	D	-	-	1,000	-	-	1,000	
Operational Expenses		**$ 24,215**	**$ -**	**$ 28,715**	**$ -**	**$ -**	**$ 29,100**	
General Fund	D	24,215	-	28,715	-	-	29,100	
TOTALS		**$ 281,533**	**$ -**	**$ 288,033**	**$ -**	**$ -**	**$ 310,097**	
Gross New Budget Authority		**281,533**	**-**	**288,033**	**-**	**-**	**310,097**	
Rescissions		**-**		**-**			**-**	
Transfers		**-**		**-**			**-**	
Offsets		**(145,000)**	**-**	**(145,000)**	**-**	**-**	**(154,600)**	
NET NEW BUDGET AUTHORITY:		**$ 136,533**	**$ -**	**$ 143,033**	**$ -**	**$ -**	**$ 155,497**	
[Mandatory BA]		**-**	**-**	**-**	**-**	**-**	**-**	
[Discretionary BA]		**$ 108,215**	**$ -**	**$ 113,715**	**$ -**	**$ -**	**$ 155,497**	
[Obligation Limitation]		**$ 28,318**	**$ -**	**$ 29,318**	**$ -**	**$ -**	**$ -**	

/1 *FY 2022 mandatory program shown at estimated reciept level. For FY 2022 Obligation Limitation language removed.*

EXHIBIT II-4
FY 2022 OUTLAYS
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
($000)

ACCOUNT NAME	M/D	FY 2020 ACTUAL	FY 2020 CARES Act	FY 2021 ENACTED	FY 2021 CRRSA	FY 2021 American Rescue Plan	FY 2022 PRESIDENT'S BUDGET
Pipeline Safety							
Pipeline Safety Fund	*D*	$159,244	$0	$168,210	$0	$0	$168,522
Trust Fund Share of Pipeline Safety	*D*	17,347	0	23,000	0	0	27,650
Subtotal, Pipeline Safety		176,591	0	191,210	0	0	196,172
Hazardous Materials Safety	*D*	61,447	0	65,680	0	0	70,344
Emergency Preparedness Grants							
Mandatory	*M*	29,085	0	42,490	0	0	42,545
Discretionary	*D*	0	0	0	0	0	0
Subtotal, Emergency Preparedness Grants		29,085	0	42,490	0	0	42,545
Operational Expenses	*D*	23,982	0	27,651	0	0	25,132
Research and Special Programs	*D*	90	0	11	0	0	0
TOTAL		**$291,195**	**$0**	**$327,042**	**$0**	**$0**	**$334,193**
Discretionary		*262,110*	*0*	*284,552*	*0*	*0*	*291,648*
Mandatory		*29,085*	*0*	*42,490*	*0*	*0*	*42,545*

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
Pipeline and Hazardous Materials Safety Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

PHMSA Summary	FY 2020 ACTUAL	FY 2021 ENACTED /1	Baseline Changes: Annualization of Prior Pay Raises (3.1%)	Annualization of FY 2021 FTE	FY 2022 Pay Raises (2.7%)	Adjustment for Compensable Days (261 days)	GSA Rent	WCF Increase/ Decrease	Inflation and Other Adjustments to Base	FY 2022 Baseline Estimate	Program Increases/ Decreases	FY 2022 President's Budget Request
PERSONNEL RESOURCES	**558.0**	**589.0**		**4.0**				**(2.0)**		**591.0**	**18.5**	**609.5**
Direct FTE	558.0	589.0		4.0				(2.0)		591.0	18.5	609.5
FINANCIAL RESOURCES												
Operations												
Salaries and Benefits	$ 92,550	$ 100,137	$ 585	$ 572	$ 2,051	$ -	$ -	$ -	$ 1,102	$ 104,446	$ 2,646	$ 107,092
Travel	6,067	5,047		48					51	5,146	222	5,368
GSA Rent	7,099	7,152		-			(18)		71	7,205	241	7,446
Communications, & Utilities	336	581							6	587		587
Printing	0	0								0		0
Other Services:												
-Other	8,738	9,463		152					90	9,705	722	10,427
-WCF	4,191	4,783						443	52	5,278		5,278
-WCF IT	9,710	7,638						2,421	101	10,160		10,160
Supplies	765	709							7	716		716
Equipment	192	239		36					3	278	167	444
Operations Subtotal	**$ 129,648**	**$ 135,749**	**$ 585**	**$ 808**	**$ 2,051**	**$ -**	**$ (18)**	**$ 2,864**	**$ 1,482**	**$ 143,521**	**$ 3,997**	**$ 147,518**
PROGRAMS												
Contract Safety Programs												
Pipeline Safety	22,021	18,271						(1,922)	163	16,512	6,600	23,112
Hazardous Materials Safety	8,386	11,598						(740)	109	10,967	1,000	11,967
Emergency Preparedness Grants	775	727								727		727
Operational Expenses	4,087	4,572						(456)	41	4,157		4,157
Contract Safety Programs Subtotal	**$ 35,269**	**$ 35,168**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (3,118)**	**$ 313**	**$ 32,363**	**$ 7,600**	**$ 39,963**
Research and Development												
Pipeline Safety	15,000	12,000								12,000	3,000	15,000
Hazardous Materials Safety	7,570	5,070								5,070	2,500	7,570
Research and Development Subtotal	**$ 22,570**	**$ 17,070**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 17,070**	**$ 5,500**	**$ 22,570**
Grants												
Pipeline Safety	64,558	66,558								66,558		66,558
Hazardous Materials Safety	1,000	1,000								1,000		1,000
Emergency Preparedness Grants	26,988	27,988								27,988		27,988
Operational Expenses	1,500	4,500								4,500		4,500
Grants Subtotal	**$ 94,046**	**$ 100,046**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 100,046**	**$ -**	**$ 100,046**
Programs Subtotal	**$ 151,885**	**$ 152,284**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (3,118)**	**$ 313**	**$ 149,479**	**$ 13,100**	**$ 162,579**
TOTAL	**$ 281,533**	**$ 288,033**	**$ 585**	**$ 808**	**$ 2,051**	**$ -**	**$ (18)**	**$ (254)**	**$ 1,796**	**$ 293,001**	**$ 17,097**	**$ 310,097**

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
Pipeline and Hazardous Materials Safety Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Pipeline Safety Account	FY 2020 ACTUAL	FY 2021 ENACTED /2	Baseline Changes: Annualization of Prior Pay Raises (3.1%)	Annualization of FY 2021 FTE	FY 2022 Pay Raises (2.7%)	Adjustment for Compensable Days (261 days)	GSA Rent	WCF Increase/ Decrease	Inflation and Other Adjustments to Base	FY 2022 Baseline Estimate	Program Increases/ Decreases	FY 2022 President's Budget Request
PERSONNEL RESOURCES (FTE)	**292.0**	**316.0**		**4.0**						**320.0**	**8.5**	**328.5**
Direct FTE	292.0	316.0		4.0						320.0	8.5	328.5
FINANCIAL RESOURCES												
Operations												
Salaries and Benefits	$ 48,566	$ 52,988	$ 411	572	$ 1,093	$ -	$ -	$ -	583	$ 55,646	$ 1,216	$ 56,862
Travel	3,786	3,589		48					36	3,673	102	3,775
GSA Rent	3,528	3,840		-					38	3,878	111	3,989
Communications, & Utilities	50	268							3	271	-	271
Other Services:												
-Other	2,553	3,486		152					36	3,674	342	4,016
-WCF	2,127	2,281						553	28	2,862	-	2,862
-WCF IT	5,164	4,092						1,312	54	5,458	-	5,458
Supplies	547	491							5	496	-	496
Equipment	100	136		36					2	174	77	250
Operations Subtotal	**$ 66,421**	**$ 71,171**	**$ 411**	**$ 808**	**$ 1,093**	**$ -**	**$ -**	**$ 1,865**	**$ 786**	**$ 76,133**	**$ 1,847**	**$ 77,980**
PROGRAMS												
Contract Safety Programs												
Underground Natural Gas Storage Safety 1/	2,000	-							-	-		-
Liquefied Natural Gas Siting Fund	-	-							-	-	400	400
Compliance/Pipeline Integrity Management/Inspection Supp	8,231	7,049						(1,922)	51	5,178	6,200	11,378
Training, Information & Community Assist. Services	8,443	8,050							81	8,131		8,131
Mapping and Information Systems	1,809	1,797							18	1,815		1,815
Implementing the Oil Pollution Act	1,538	1,375							14	1,389		1,389
Contract Safety Programs Subtotal	**$ 22,021**	**$ 18,271**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (1,922)**	**$ 163**	**$ 16,512**	**$ 6,600**	**$ 23,112**
Research & Development												
General Research	13,000	10,000								10,000	3,000	13,000
Competitive Academic Agreement Program	2,000	2,000								2,000		2,000
Research & Development Subtotal	**$ 15,000**	**$ 12,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 12,000**	**$ 3,000**	**$ 15,000**
Grants												
State Pipeline Safety Grants	56,000	58,000								58,000		58,000
Underground Natural Gas Storage Grants 1/	6,000	6,000								6,000		6,000
State One-call Grants	1,058	1,058								1,058		1,058
State Damage Prevention Grants	1,500	1,500								1,500		1,500
Grants Subtotal	**$ 64,558**	**$ 66,558**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 66,558**	**$ -**	**$ 66,558**
Programs Subtotal	**$ 101,579**	**$ 96,829**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (1,922)**	**$ 163**	**$ 95,070**	**$ 9,600**	**$ 104,670**
Total Requested Budget Authority	**$ 168,000**	**$ 168,000**	**$ 411**	**$ 808**	**$ 1,093**	**$ -**	**$ -**	**$ (57)**	**$ 949**	**$ 171,204**	**$ 11,447**	**$ 182,650**

1/ The Underground Natural Gas Storage Program is requested at $6.0 million for grants and $2.0 million for operating costs in FY 2022. Operating costs are not displayed by program area benefitted.

2/ PHMSA was directed to add 8 FTE for regulatory improvement in the Protecting our Infrastructure of Pipelines and Enhancing Safety Act (PIPES Act) 2021. PHMSA is adding those positions in FY 2021 and annualizing the positions for the FY 2022 current services.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
Pipeline and Hazardous Materials Safety Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Hazardous Materials Safety Account	FY 2020 ACTUAL	FY 2021 ENACTED	Baseline Changes: Annualization of Prior Pay Raises (3.1%)	Annualization of FY 2021 FTE	FY 2022 Pay Raises (2.7%)	Adjustment for Compensable Days (261 days)	GSA Rent	WCF Increase/ Decrease	Inflation and Other Adjustments to Base	FY 2022 Baseline Estimate	Program Increases/ Decreases	FY 2022 President's Budget Request
PERSONNEL RESOURCES (FTE)	**197.0**	**203.0**						-		**203.0**	**10.0**	**213.0**
Direct FTE	197.0	203.0						-		203.0	10.0	213.0
FINANCIAL RESOURCES												
Operations												
Salaries and Benefits	$ 31,613	$ 33,501	$ 125	$ -	$ 681	$ -	$ -	$ -	369	$ 34,675	$ 1,430	$ 36,105
Travel	2,069	1,399							14	1,413	120	1,533
GSA Rent	2,500	2,418							24	2,442	130	2,572
Communications, & Utilities	148	173							2	175		175
Other Services:												
-Other	2,570	2,086							21	2,107	380	2,487
-WCF	1,580	1,955						(155)	18	1,818		1,818
-WCF IT	3,393	2,629						875	35	3,539		3,539
Supplies	108	108							1	109		109
Equipment	63	63							1	64	90	154
Operations Subtotal	**$ 44,044**	**$ 44,332**	**$ 125**	**$ -**	**$ 681**	**$ -**	**$ -**	**$ 720**	**$ 484**	**$ 46,342**	**$ 2,150**	**$ 48,492**
PROGRAMS												
Contract Safety Programs												
Hazmat Information and Analysis	$ 1,907	$ 2,017						$ (740)	13	$ 1,290	$ -	$ 1,290
Investigation and Enforcement	2,753	3,307							33	3,340		3,340
Outreach, Training and Compliance	2,937	3,140							31	3,171		3,171
State Hazardous Materials Safety Training		2,500							25	2,525	1,000	3,525
Hazmat Registration Program	789	634						-	6	640		640
Contract Safety Programs Subtotal	**$ 8,386**	**$ 11,598**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (740)**	**$ 109**	**$ 10,967**	**$ 1,000**	**$ 11,967**
Research & Development	$ 7,570	$ 5,070								$ 5,070	$ 2,500	$ 7,570
Research & Development Subtotal	**$ 7,570**	**$ 5,070**								**$ 5,070**	**$ 2,500**	**$ 7,570**
Grants												
State Hazardous Materials Safety Training	-	-								-	-	-
Community Safety Grants	$ 1,000	$ 1,000								1,000	-	1,000
Grants Subtotal	**$ 1,000**	**$ 1,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,000**	**$ -**	**$ 1,000**
Programs Subtotal	**$ 16,956**	**$ 17,668**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (740)**	**$ 109**	**$ 17,037**	**$ 3,500**	**$ 20,537**
TOTAL	**$ 61,000**	**$ 62,000**	**$ 125**	**$ -**	**$ 681**	**$ -**	**$ -**	**$ (20)**	**$ 593**	**$ 63,379**	**$ 5,650**	**$ 69,029**

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
Pipeline and Hazardous Materials Safety Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

			Baseline Changes									
Emergency Preparedness Account	**FY 2020 ACTUAL**	**FY 2021 ENACTED**	**Annualization of Prior Pay Raises (3.1%)**	**Annualization of FY 2021 FTE**	**FY 2022 Pay Raises (2.7%)**	**Adjustment for Compensable Days (261 days)**	**GSA Rent**	**WCF Increase/ Decrease**	**Inflation and Other Adjustments to Base**	**FY 2022 Baseline Estimate**	**Program Increases/ Decreases**	**FY 2022 President's Budget Request**
FINANCIAL RESOURCES												
Operations												
Other Services:												
-Other	$ 555	$ 603	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 603		$ 603
Operations Subtotal	**$ 555**	**$ 603**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 603**	**$ -**	**$ 603**
PROGRAMS												
Grants *(HMEP, HMIT, & SPST)*	$ 26,988	$ 26,988	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 26,988		$ 26,988
Assistance for Local Emergency Response Training (ALER	-	1,000								1,000		1,000
Technical Assistance	150	141								141		141
Emergency Response Guidebook	625	586								586		586
Programs Subtotal	**$ 27,763**	**$ 28,715**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 28,715**	**$ -**	**$ 28,715**
TOTAL	**$ 28,318**	**$ 29,318**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 29,318**	**$ -**	**$ 29,318**

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
Pipeline and Hazardous Materials Safety Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Operational Expenses Account	FY 2020 ACTUAL	FY 2021 ENACTED	Baseline Changes: Annualization of Prior Pay Raises (3.1%)	Annualization of new FY 2021 FTE	FY 2022 Pay Raises (2.7%)	Adjustment for Compensable Days (261 days)	GSA Rent	WCF Increase/ Decrease	Inflation and Other Adjustments to Base	FY 2022 Baseline Estimate	Program Increases/ Decreases	FY 2022 President's Budget Request
PERSONNEL RESOURCES (FTE)	**69.0**	**70.0**						**(2.0)**		**68.0**		**68.0**
Direct FTE	69.0	70.0						(2.0)		68.0		68.0
FINANCIAL RESOURCES												
Operations												
Salaries and Benefits	$ 12,371	$ 13,648	$ 49	$ -	$ 277	$ -	$ -	$ -	150	$ 14,124		$ 14,124
Travel	212	59							1	60		60
GSA Rent	1,071	894					(18)		9	885		885
Communications & Utilities	138	140							1	141		141
Other Services:												
-Other	3,060	3,288							33	3,321		3,321
-WCF	484	547						45	6	598		598
-WCF IT	1,153	917						234	12	1,163		1,163
Supplies	110	110							1	111		111
Equipment	29	40							0	40		40
Operations Subtotal	**$ 18,628**	**$ 19,643**	**$ 49**	**$ -**	**$ 277**	**$ -**	**$ (18)**	**$ 279**	**$ 213**	**$ 20,443**	**$ -**	**$ 20,443**
PROGRAMS												
Contract Safety Programs												
Information Technology amd Modernization	4,087	4,572						(456)	41	4,157	-	4,157
Contract Safety Programs Subtotal	**$ 4,087**	**$ 4,572**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (456)**	**$ 41**	**$ 4,157**	**$ -**	**$ 4,157**
Grants												
Information Grants to Communities	1,500	2,000								2,000	-	2,000
Emergency Response Grants		2,500								2,500	-	2,500
Grants Subtotal	**$ 1,500**	**$ 4,500**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 4,500**	**$ -**	**$ 4,500**
Programs Subtotal	**$ 5,587**	**$ 9,072**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (456)**	**$ 41**	**$ 8,657**	**$ -**	**$ 8,657**
TOTAL	**$ 24,215**	**$ 28,715**	**$ 49**	**$ -**	**$ 277**	**$ -**	**$ (18)**	**$ (177)**	**$ 254**	**$ 29,100**	**$ -**	**$ 29,100**

EXHIBIT II-6
WORKING CAPITAL FUND
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
($000)

	FY 2020 ACTUAL	FY 2021 ENACTED	FY 2022 PRESIDENT'S BUDGET
DIRECT:			
Pipeline Safety	$ 2,127	$ 2,281	$ 2,862
Commodity Shared Services and WCF IT	5,164	4,092	5,458
Hazardous Materials Safety	1,580	1,955	1,818
Commodity Shared Services and WCF IT	3,393	2,629	3,539
Operational Expenses	484	547	598
Commodity Shared Services and WCF IT	1,153	917	1,163
TOTAL	$ 13,901	$ 12,421	$ 15,438

EXHIBIT II-7
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
PERSONNEL RESOURCE -- SUMMARY
TOTAL FULL-TIME EQUIVALENTS

	FY 2020 ACTUAL	FY 2021 ENACTED /1	FY 2022 PRESIDENT'S BUDGET
DIRECT FUNDED BY APPROPRIATION			
Pipeline Safety	292.0	316.0	328.5
Hazardous Materials Safety	197.0	203.0	213.0
Operational Expenses	69.0	70.0	68.0
CARES ACT			
Pipeline Safety	-	-	-
Hazardous Materials Safety	-	-	-
Operational Expenses	-	-	-
CRRSA ACT			
Pipeline Safety	-	-	-
Hazardous Materials Safety	-	-	-
Operational Expenses	-	-	-
American Rescue Plan			
Pipeline Safety	-	-	-
Hazardous Materials Safety	-	-	-
Operational Expenses	-	-	-
SUBTOTAL, DIRECT FUNDED	558.0	589.0	609.5

1/ PHMSA was directed to add 8 FTE for regulatory improvement in the Protecting our Infrastructure of Pipelines and Enhancing Safety Act (PIPES Act) 2021. PHMSA is adding those positions in FY 2021 and annualizing the positions for the FY 2022 current services.

EXHIBIT II-8
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
RESOURCE SUMMARY – STAFFING
FULL-TIME PERMANENT POSITIONS

	FY 2020 ACTUAL	FY 2021 ENACTED	FY 2022 PRESIDENT'S BUDGET
DIRECT FUNDED BY APPROPRIATION			
Pipeline Safety	292	320	337
Hazardous Materials Safety	197	203	223
Operational Expenses	70	70	68
CARES ACT			
Pipeline Safety	0	0	0
Hazardous Materials Safety	0	0	0
Operational Expenses	0	0	0
CRRSA ACT			
Pipeline Safety	0	0	0
Hazardous Materials Safety	0	0	0
Operational Expenses	0	0	0
American Rescue Plan			
Pipeline Safety	0	0	0
Hazardous Materials Safety	0	0	0
Operational Expenses	0	0	0
SUBTOTAL, DIRECT FUNDED	559	593	628

1/ PHMSA was directed to add 8 FTE for regulatory improvement in the Protecting our Infrastructure of Pipelines and Enhancing Safety Act (PIPES Act) 2021. PHMSA is adding those positions in FY 2021 and annualizing the positions for the FY 2022 current services.

EXHIBIT II-9
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
HISTORY OF APPROPRIATIONS
Pipeline Safety

YEAR	REQUEST	ENACTED
2013	$155,500,000	$86,884,000
2014	$133,000,000	$100,014,000
2015	$140,000,000	$126,000,000
2016	$155,604,000	$124,500,000
2017	$156,943,000	$154,580,000
2018	$132,263,326	$139,000,000
2019	$127,200,000	$142,000,000
2020	$127,000,000	$145,000,000
2021	$141,000,000	$145,000,000
2022	$155,000,000	

EXHIBIT II-9
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
HISTORY OF APPROPRIATIONS
Trust Fund Share of Pipeline Safety
(Oil Spill Liability Trust Fund)

YEAR	REQUEST	ENACTED	
2013	$21,510,000	$17,602,000	1/ & 2/
2014	$18,573,000	$18,573,000	
2015	$19,500,000	$19,500,000	
2016	$19,500,000	$22,123,000	
2017	$19,500,000	$20,288,000	
2018	$22,080,944	$23,000,000	
2019	$23,000,000	$23,000,000	
2020	$22,000,000	$23,000,000	
2021	$22,000,000	$23,000,000	
2022	$27,650,000		

1/ Reflects the funding levels provided by a full-year continuing resolution.

2/ Reflects reductions from sequestration (Sec. 1113 of Division B of P.L. 113-6).

EXHIBIT II-9
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
HISTORY OF APPROPRIATIONS
Hazardous Materials Safety

YEAR	REQUEST	ENACTED
2013	$50,673,000	$40,123,000
2014	$51,801,000	$45,000,000
2015	$52,000,000	$52,000,000
2016	$64,254,000	$55,619,000
2017	$68,249,000	$57,000,000
2018	$55,513,268	$59,000,000
2019	$52,070,000	$58,000,000
2020	$53,000,000	$61,000,000
2021	$61,000,000	$62,000,000
2022	$69,029,000	

EXHIBIT II-9
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
HISTORY OF APPROPRIATIONS
Emergency Preparedness Grants
(Obligation Limitation)

YEAR	REQUEST	ENACTED
2012	$28,318,000	$28,318,000
2013	$28,318,000	$26,865,000
2014	$28,318,000	$26,293,000
2015	$28,318,000	$26,265,000
2016	$28,318,000	$26,405,000
2017	$28,318,000	$26,364,058
2018	$28,318,000	$26,449,012
2019	$28,318,000	$26,562,000
2020	$28,318,000	$26,704,000
2021	$28,318,000	$29,318,000
2022	$29,318,000	

EXHIBIT II-9
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
HISTORY OF APPROPRIATIONS
Operational Expenses

YEAR	REQUEST	ENACTED
2013	$20,047,000	$19,295,000
2014	$20,154,000	$20,154,000
2015	$20,725,000	$20,725,000
2016	$21,000,000	$21,000,000
2017	$22,188,000	$22,500,000
2018	$20,960,079	$23,000,000
2019	$23,710,000	$23,710,000
2020	$24,215,000	$24,215,000
2021	$24,215,000	$28,715,000
2022	$29,100,000	

EXHIBIT III-1a

All Accounts
SUMMARY ANALYSIS OF CHANGE FROM FY 2021 TO FY 2022
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	FTE
FY 2021 Enacted	$ 288,033	589.0
ADJUSTMENTS TO BASE:		
Annualization of Prior Pay Raises (3.1%)	585	-
Annualization of FY 2021 FTE	808	4.0
FY 2022 Pay Raises (2.7%)	2,051	-
GSA Rent	(18)	-
Working Capital Fund	(254)	-
Adjustment for Compensable Days (261 days)	-	-
Inflation and Other Adjustments to Base	1,796	-
SUBTOTAL, ADJUSTMENTS TO BASE	**4,968**	**4.0**
PROGRAM REDUCTIONS		
Pipeline Safety		
None	-	-
Hazardous Materials Safety		
None		-
Operational Expenses		
None		
SUBTOTAL, PROGRAM REDUCTIONS	**-**	**-**
PROGRAM INCREASES		
Pipeline Safety		
Add 17 Inspectors (8.5 FTE) to reach PIPES act levels	1,847	8.5
Contract Safety Programs to complete PIPES Act Requirements	6,200	-
Liquefied Natural Gas Siting Fund	400	
Research & Development	3,000	-
Hazardous Materials Safety		
Add 20 Positions (10 FTE) for Outreach	2,150	10.0
Increase Hazmat State Program	1,000	-
Research & Development	2,500	-
OPERATIONAL EXPENSES		
None		
SUBTOTAL, PROGRAM INCREASES	**17,097**	**18.5**
FY 2022 REQUEST	**$ 310,097**	**611.5**

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III: Budget Request by Appropriation Account Exhibits and Narrative Justification

Pipeline Safety

APPROPRIATIONS LANGUAGE

PIPELINE SAFETY

(PIPELINE SAFETY FUND)

(OIL SPILL LIABILITY TRUST FUND)

For expenses necessary to carry out a pipeline safety program, as authorized by 49 U.S.C. 60107, and to discharge the pipeline program responsibilities of the Oil Pollution Act of 1990, [$168,000,000] $*182,650,000*, to remain available until September 30, [2023] *2024*, of which [$23,000,000] *$27,650,000* shall be derived from the Oil Spill Liability Trust Fund; of which [$137,000,000] *$146,600,000* shall be derived from the Pipeline Safety Fund; *of which $400,000 shall be derived from the fees collected under 49 U.S.C. 60303 and deposited in the Liquefied Natural Gas Siting Account for compliance reviews of liquefied natural gas facilities;* and of which $8,000,000 shall be derived from fees collected under 49 U.S.C. 60302 and deposited in the Underground Natural Gas Storage Facility Safety Account for the purpose of carrying out 49 U.S.C. 60141.

[Provided, that not less than $1,058,000 of the funds provided under this heading shall be for the One-Call State grant program:]

[Provided further, that any amounts provided under this heading in this Act or in prior Acts for research contracts, grants, cooperative agreements or research other transactions agreements ("OTAs") shall require written notification to the House and Senate Committees on Appropriations not less than 3 full business days before such research contracts, grants, cooperative agreements, or research OTAs are announced by the Department of Transportation:]

[Provided further, That the Administrator may obligate amounts made available under this heading to engineer, erect, alter, and repair buildings or make any other public improvements for research facilities at the Transportation Technology Center after the Administrator submits an updated research plan to the House and Senate Committees on Appropriations and after such plan is approved by the House and Senate Committees on Appropriations.]

EXHIBIT III-1
Pipeline Safety
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2020 ACTUAL	FY 2021 ENACTED	FY 2022 PRESIDENT'S REQUEST
Operations /1	$ 88,442	$ 89,442	$ 101,092
Research and Development	15,000	12,000	15,000
Grants	64,558	66,558	66,558
TOTAL	$ 168,000	$ 168,000	$ 182,650
FTEs			
Direct Funded	292.0	316.0	328.5

1/ PHMSA was directed to add 8 FTEs for regulatory improvement in the Protecting our Infrastructure of Pipelines and Enhancing Safety Act (PIPES Act) 2021. PHMSA is adding those positions in FY 2021 and annualizing the positions for the FY 2022 current services.

Program and Performance Statement

PHMSA oversees the safe transportation of energy products and hazardous materials through pipelines. PHMSA's pipeline safety program regulates an expansive network of approximately 2.8 million miles of gas and hazardous liquid pipelines within the United States, as well as facilities that liquefy natural gas and store natural gas underground. PHMSA establishes and enforces pipeline safety standards and conducts safety inspections in collaboration with State partners to monitor the construction, operation and maintenance activities of pipeline operators. The pipeline safety program is funded by fees collected from pipeline and underground natural gas storage facility operators, as well as by an annual allocation from the Oil Spill Liability Trust Fund.

EXHIBIT III-1a
Pipeline Safety
SUMMARY ANALYSIS OF CHANGE FROM FY 2021 TO FY 2022
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	FTE
FY 2021 ENACTED	$ 168,000	316.0
ADJUSTMENTS TO BASE:		
Annualization of FY 2021 FTE	808	4.0
Annualization of Prior Pay Raises (3.1%)	411	-
FY 2022 Pay Raises (2.7%)	1,093	-
GSA Rent	-	-
Working Capital Fund	(57)	-
Inflation and Other Adjustments to Base	949	-
Adjustment for Compensable Days (261 days)	-	-
SUBTOTAL, ADJUSTMENTS TO BASE	**3,204**	**4.0**
PROGRAM REDUCTIONS		
None	-	-
SUBTOTAL, PROGRAM REDUCTIONS	**-**	**-**
PROGRAM INCREASES		
Add 17 Inspectors (8.5 FTE) to reach PIPES Act levels	1,847	8.5
Contract Safety Programs	6,200	-
Liquefied Natural Gas Siting Fee	400	-
Research & Development	3,000	-
SUBTOTAL, PROGRAM INCREASES	**11,447**	**8.5**
FY 2022 REQUEST	**$ 182,650**	**328.5**

1/ PHMSA was directed to add 8 FTEs for regulatory improvement in the Protecting our Infrastructure of Pipelines and Enhancing Safety Act (PIPES Act) 2020. PHMSA is adding those positions in FY 2021 and annualizing the positions for the FY 2022 President's Budget request.

Detailed Justification for the Pipeline Safety Program

FY 2022 – Pipeline Safety Program Budget Request
($000)

Program Activity	FY 2020 Actual	FY 2021 Enacted	FY 2022 Request
Operations	$ 66,421	$ 71,171	$ 77,980
Contract Safety Programs	22,021	18,271	23,112
Research and Development	15,000	12,000	15,000
Grants	64,558	66,558	66,558
Total	**$ 168,000**	**$ 168,000**	**$ 182,650**
FTEs	**292.0**	**316.0**	**328.5**

What Is the Goal of the Pipeline Safety Program and What Does the Funding Level Support?

Key Pipeline Safety Request Highlights:

- **$11.9 million unfunded PIPES Act of 2020 mandates (Pipeline Safety)**
  - $6.2 million **to complete the 36 new congressional mandates in PIPES Act of 2020** (new hiring mandates; expedited rulemakings; increased inspections; additional reviews, studies, and reports to Congress);
  - $3.9 million in baseline increases including the remaining cost to **add 8 regulatory positions to complete safety mandates**; and
  - $1.8 million to **add 17 inspection and enforcement staff to required PIPES Act of 2020** levels and to **complete safety checks for pipeline operators** protecting the environment from spills/incidents.
  - All of which will **strengthen pipeline safety Nationally and reduce climate and environmental impacts**. This will enable PHMSA to **advance the President's climate change agenda** by **reducing methane emissions** in the oil/gas sector and mitigate environmental damage from spills and incidents.

- **$3.0 million Research & Development (Pipeline Safety)**
  - restore Pipeline Safety Research and Development to pre-FY 2021 levels. This will allow PHMSA to focus on **innovative, transformational pipeline safety research**, including in the areas of **cleaner fuel alternatives** such as hydrogen and bio-based fuels.

PHMSA's pipeline safety program supports the safe delivery of energy products to market in a manner that protects people, property and the environment. Most gas and oil products move via pipeline from their sources to refineries and then to market. Since 2000, the United States' energy production has more than doubled, with nearly all energy products transported to refineries and into

consumer markets without incident.

PHMSA's Oversight: Expansive Network of US Pipelines
The United States operates the most expansive network of energy pipelines in the world with PHMSA overseeing the safe operation of 225,000 miles of hazardous liquid pipelines, 302,000 miles of gas transmission pipelines, 2,281,000 miles of gas distribution mains and services, and 17,000 miles of gas-gathering pipelines. PHMSA also oversees safe operations of 163 liquefied natural gas plants with a total storage capacity of more than 57 million barrels, and 400 underground natural gas storage facilities with a total capacity of 4.6 billion cubic feet. The network safely transports 65 percent of the energy consumed in the United States, helping to power nearly every facet of our daily lives, and providing significant economic benefits to the Nation.

PHMSA's mission is to protect people and the environment by advancing the safe transportation of energy and other hazardous materials that are essential to our daily lives. As part of this mission, PHMSA administers a national regulatory safety program for approximately 2.8 million miles of interstate and intrastate pipelines in the United States. Many of these pipelines are part of an aging infrastructure network, and travel through cities and neighborhoods, especially those that have been historically underserved. Going forward, modernization of old, less reliable pipeline networks with newer pipes that can pave the way for cleaner fuels, such and hydrogen and bio-blends will be critical.

This program requires that pipeline operators design, construct, operate, and maintain their pipeline facilities in compliance with the Federal Pipeline Safety Regulations (PSR). To help ensure that operators comply with these regulations, PHMSA conducts inspections of pipeline facilities for compliance with the PSRs.

PHMSA's Important Role: Safe Storage of Natural Gas Underground
The Protecting our Infrastructure of Pipelines and Enhancing Safety Act of (PIPES Act) 2016 charged PHMSA with safety oversight of 400 underground natural gas storage facilities in 30 states. PHMSA continues its mission through the PIPES Act of 2020. Natural gas is an important commodity worldwide, particularly for generating power and for domestic space heat. Underground storage facilities are a critical component of the United States' natural gas supply infrastructure.

Underground natural gas storage facilities provide substantial benefits, such as more reliable and responsive delivery of the product. Industry has found a more resilient method of storing the natural gas than before. In addition to storing the gas in a depleted natural gas or oil field, natural aquifers and salt caverns have been converted to natural gas storage reservoirs. These different types of underground natural gas storage (see Figure 1 below) offer natural gas providers flexibility to manage seasonal variations in demand and provide a buffer for changing production levels. Local distribution companies, for instance, can quickly access large volumes of gas (stored off peak times) for end-users during periods of high demand, such as during a cold spell in the winter or a period of high electricity demand in the summer. Underground storage also allows natural gas to be stored safely after extraction while awaiting domestic use or export. Without underground natural gas storage facilities, additional pipelines would need to be constructed to meet daily peak demands. Thus, a benefit of underground natural gas storage facilities is a lesser environmental impact due to the need for fewer pipelines to meet energy demand. Fewer pipelines in the ground mean less digging, invasive construction underground, and impact to the natural environment overall.

Types of Underground Storage Facilities

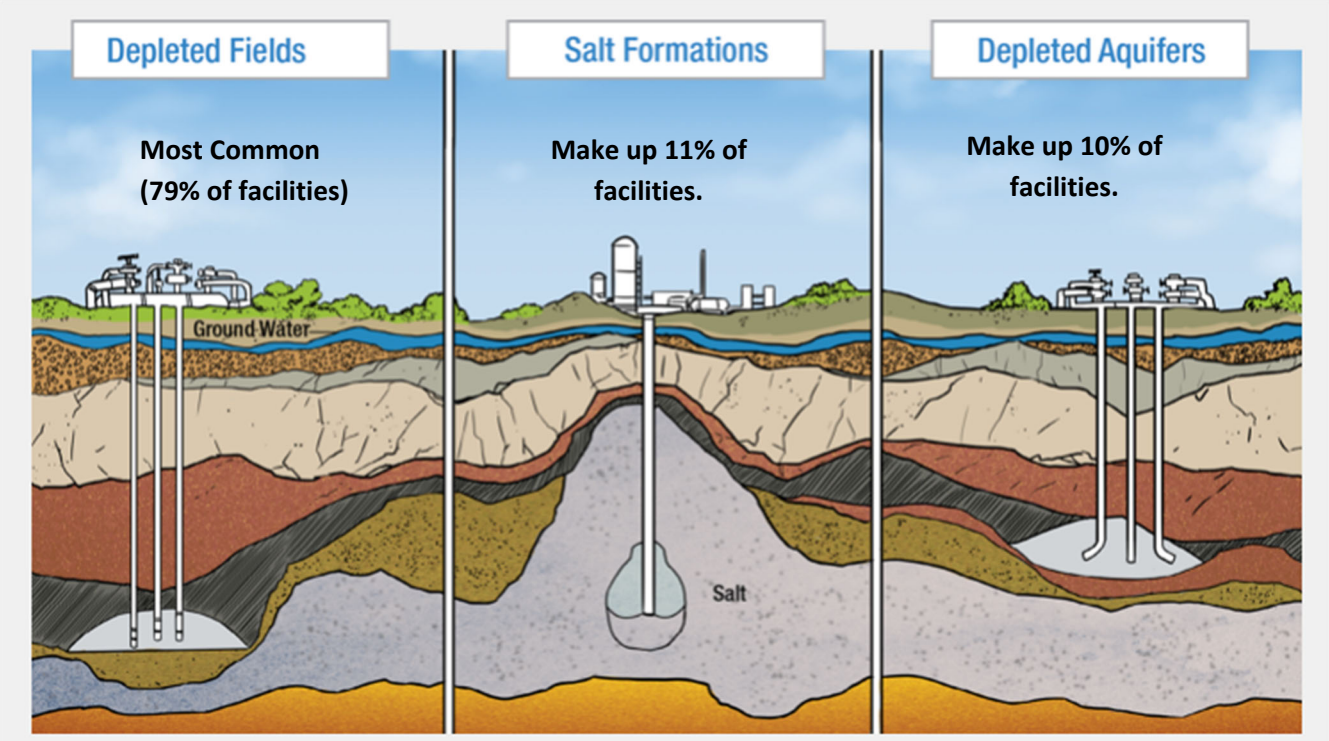
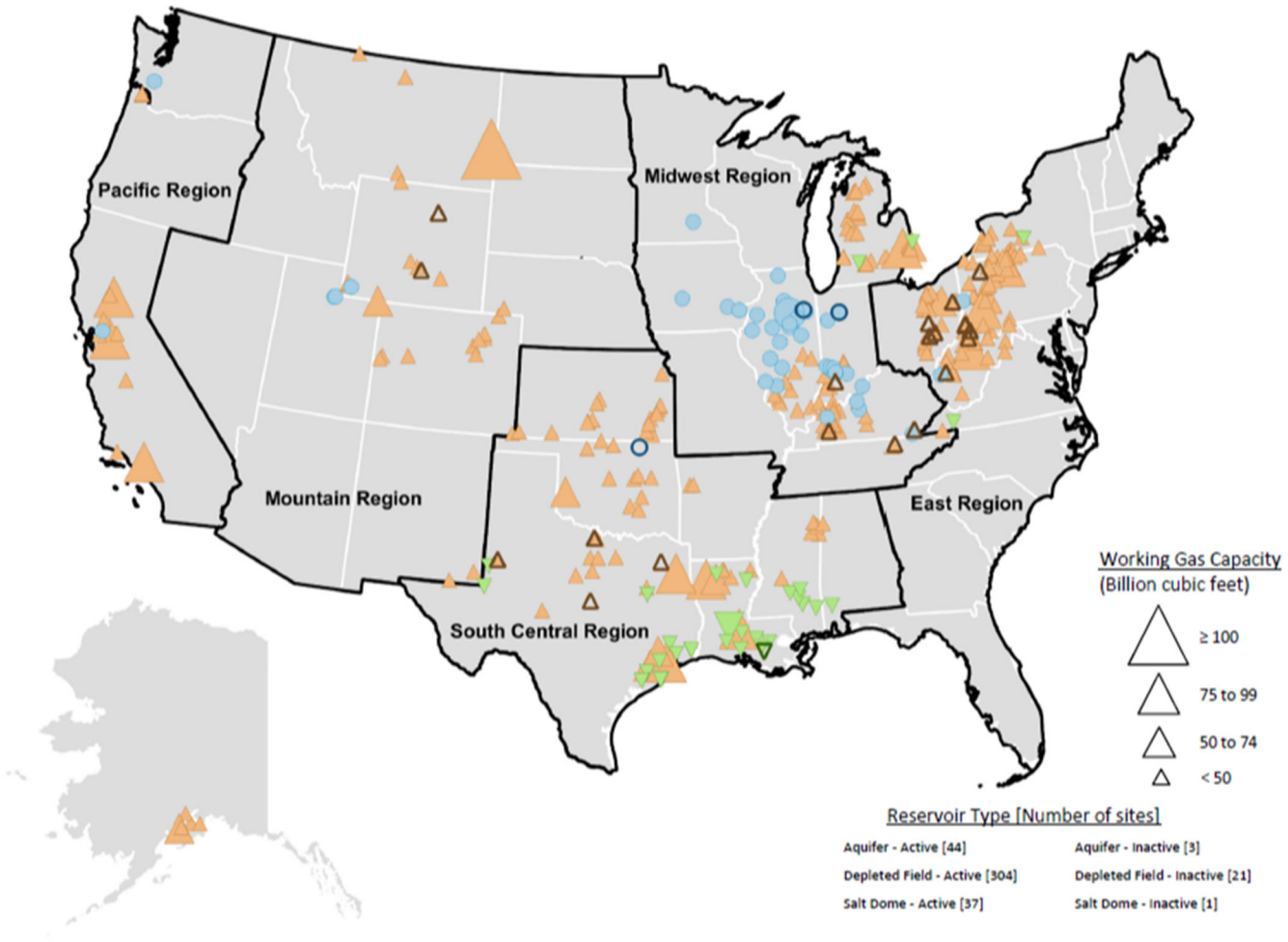


Figure 1: Natural Gas Storage Types provided by www.energyinfrastructure.org

Roughly 85 percent of underground natural gas storage facilities in the United States hold natural gas in depleted oil and gas reservoirs, while the rest remain stored in salt caverns and depleted aquifers. PHMSA develops safety standards for containment within these natural formations and conducts periodic inspections.

U.S. Underground Natural Gas Storage Facility by Type, 2018



Source: U.S. Energy Information Administration (EIA), Form EIA-191, "*Monthly Underground Gas Storage Report*." Field locations are based on county centroids.

Operations: $77.98 million

PHMSA's FY 2022 budget request includes $77.98 million to fund 337 positions and cover costs of salaries, benefits, travel, training, supplies, and equipment (including personal protective equipment for all inspectors). Of the 337 positions, 235 are inspection and enforcement staff distributed across the country through a network of regional offices, as well as subject matter experts that help ensure the safe operation of pipelines and underground natural gas storage facilities.

PHMSA's Office of Pipeline Safety is headquartered in Washington, D.C., with eight field offices located in West Trenton, NJ; Atlanta, GA; Kansas City, MO; Houston, TX; Lakewood, CO; Chicago, IL; Ontario, CA; and Anchorage, AK. PHMSA also operates a national training center and accident investigation office located in Oklahoma City, OK. PHMSA's staff conducts inspections, investigations, outreach, and enforcement activities. PHMSA's staff also works alongside its State partners and participate in spill response drills led by the U.S. Coast Guard.

Hiring and Retention Incentives for Hard-to-Fill Positions: PHMSA relies on specially-trained engineers to conduct inspection and enforcement activities. PHMSA competes with the private sector to attract and retain qualified pipeline inspectors, accident investigators, and engineering analysts. The commercial energy industry and at least one other federal agency offers candidates higher salaries and provides incentives, placing PHMSA at a disadvantage in recruiting and retaining the best staff. In recent years, PHMSA has focused significant efforts on recruiting and retaining highly qualified inspectors and engineers. In recognition of the critical nature of these positions, the PIPES Act authorized PHMSA to provide recruitment and retention incentives such as tuition assistance, student loan repayment, and special pay rates. PHMSA is requesting $2.5 million in the FY 2022 to fully fund these important initiatives (part of the $6.2 million request to fulfill the 36 new mandates in the PIPES Act).

Underground Natural Gas Storage Facilities: The storage of natural gas at underground facilities buffers seasonal variations in demand for natural gas. The PIPES Act required PHMSA to issue minimum safety standards for these facilities and to conduct inspections. The PIPES Act also provides grants-in-aid to state pipeline safety inspection programs to inspect these facilities. In FY 2022, PHMSA will use $2.0 million of its Underground Natural Gas Storage receipts to continue funding 10 Full-Time Employees (FTEs) that have been assigned to inspect these facilities.

Liquefied Natura Gas Facilities: PHMSA evaluates proposed LNG plants' safety siting. PHMSA also conducts safety inspections during facility construction and operation. Currently, 25 LNG facilities require compliance inspections; PHMSA inspects the facilities an average of once every 3 years. PHMSA is also conducting on-going inspections of nine LNG facilities under construction to ensure compliance with regulatory standards and will inspect other facilities as they are developed and built.

Contract Safety Programs: $23.11 million

Contracts for pipeline safety programs support PHMSA's inspection and compliance activities, thus helping ensure the safe movement of hazardous materials through the nation's pipeline network. PHMSA collects and analyzes data to inform safety standards, and trains both Federal and state inspection and enforcement staff. Contract funds also support PHMSA's efforts to increase communication with those impacted by pipelines, particularly in underserved and vulnerable communities, as well as support excavation damage prevention efforts, and assist PHMSA in the review of special permits and approvals. The Office of Pipeline Safety's contracted safety programs are below.

Response to the Safety Risks from Growth in Liquefied Natural Gas Facilities and Transport

Liquefied Natural Gas Facility Siting Reviews, $400 thousand
PHMSA determines whether the siting, design, construction, operations, maintenance, personnel qualification and training, fire protection, and security of certain Liquefied Natural Gas (LNG) facilities are effective and comply with federal safety standards. Recent expansion in the production of natural gas for consumption in the United States and for export has contributed to the expansion of liquefaction facilities and transportation of liquefied natural gas.

There are more than 110 LNG facilities operating in the United States. PHMSA is responsible for ensuring these and future facilities operate safely (Part 193 reviews). When a new facility is proposed that will cost more than $2.5 billion to construct, PHMSA collects a siting review fee to offset the cost of the Part 193 safety siting review.

Safety Compliance including Pipeline Integrity Management Oversight, $11.37 million: PHMSA issued safety standards and regulations that operators must follow to properly design, construct, operate and maintain their pipelines. PHMSA conducts compliance inspections of more than 560 unique pipeline companies, many who operate multiple pipeline systems. Additionally, operators must regularly update their pipeline integrity management plans to assess the condition of the pipelines and implement preventative and mitigative actions to ensure safety and prevent incidents that could injure people, harm property or degrade environmental resources such as drinking water.

Training, Information and Community Assistance Services, $8.13 million: To enhance pipeline safety, PHMSA funds training, information-sharing, and community assistance services for internal and external stakeholders. PHMSA facilitates communication among pipeline stakeholders, including the public, operators, and government officials. PHMSA also participates with the Common Ground Alliance on pipeline damage prevention efforts and maintains representatives in each region who inform communities about pipeline safety risks, answer questions, and field complaints. In FY 2020, PHMSA participated in approximately 125 outreach and engagement activities.

Mapping and Information Systems, $1.82 million: PHMSA's National Pipeline Mapping System (NPMS) is designed to assist federal, state, and local government officials as well as pipeline operators with displaying and querying data related to gas transmission and hazardous liquid pipelines, liquefied natural gas plants, and breakout tanks. Congress mandated PHMSA to provide high consequence area geographic information systems (GIS) data sets to pipeline operators once every two years. This system helps ensure safety of the pipeline network and avoid adverse environmental impacts.

Implementing the Oil Pollution Act, $1.39 million: The 1990 Oil Pollution Act requires that operators who store, handle, or transport oil prepare spill response plans to minimize the environmental impact of oil spills and improve public- and private-sector responses. PHMSA reviews response plans submitted by operators of onshore oil pipelines to ensure compliance, maintaining approximately 550 response plans and reviewing 250 plans annually. PHMSA approves compliant plans and requires operators with deficient plans to make corrections. The agency reviews all corrected plans before issuing an approval. This critical function ensures protection of the on-shore environment.

Research and Development: $15.00 million

While PHMSA generates safety improvements through issuing regulations, inspections, investigations, and enforcement, these efforts do not address the root causes of all pipeline incidents. Many pipeline failure triggers are best identified and corrected through technological innovations, such as incidents caused by corrosion, material failure, and equipment failure. Together, these three causes were responsible for 55% of all pipeline incidents in 2020.

PHMSA's Office of Pipeline Safety funds research on projects that provide near-term solutions to improve pipeline safety, reduce the environmental impact of failures, and enhance the safety and reliability of the nation's pipeline transportation system. Research findings inform regulatory and enforcement activities and provide the technical and analytical foundation to plan, evaluate, and improve the pipeline safety program. This research is the underpinning to ensure the environment is kept safe and free of harmful spills and leaks.

In FY 2021, PHMSA is preparing a report on the current Research and Development capabilities, root cause analysis of pipeline risks/failures, identification of key research objectives, and evaluating the

necessity of an independent pipeline testing facility. PHMSA continues to work with the Department, OMB, and Congress on this key initiative.

Research and Development projects are co-funded with industry and academia. Projects develop technology related to leak detection, mechanical damage detection, excavation damage prevention, pipeline system control improvements, monitoring and operations, and pipeline material improvements. In selecting Research and Development proposals, the Office of Pipeline Safety gives preference to projects likely to bring a product to market within five years. Since 2002, the Research and Development program has brought 33 new technologies to market.

Underground Natural Gas Storage (UNGS) and Liquefied Natural Gas (LNG) Facility Safety

UNGS and LNG facility safety are also areas of increasing Research and Development importance because of the rapid growth in LNG use and PHMSA's regulatory responsibilities in UNGS. The Aliso Canyon storage gas leak, for instance, gained national attention and prompted new Research and Development initiatives in design and reliability improvements to UNGS equipment, such as tubing, packers, and subsurface safety valves, as well as knowledge generation on associated maintenance practices for UNGS wells. The incident also resulted in PHMSA initiating a new regulatory oversight program for UNGS. Underground gas storage research will support risk assessments, well-casing integrity, subsurface safety valve testing, and subsurface- and facility-level equipment analysis and monitoring. These advances will improve the safety of UNGS and protect the environment from damaging leaks.

In-Line Inspection Technology for Small Diameter Pipelines (Courtesy of Quest Integrated, LLC)

The use of in-line inspection devices was once limited to larger-diameter pipelines with long, smooth bends. PHMSA's Research and Development program helped develop technology allowing small-diameter pipelines with sharp turns to be internally inspected for defects, thereby increasing the percentage of pipelines that can be internally inspected. In addition, PHMSA's research supported aircraft-based systems that can detect leaks from gas and hazardous liquid pipelines.

The expansion of the domestic and international LNG transportation industry has highlighted the need to establish and implement the best safety practices. LNG transportation research will examine regulatory requirements and standards incorporated into the Code of Federal Regulations for LNG, performance gap analyses, and Quantitative Risk Assessment methodologies so that they can keep pace with the growing demand to export LNG. Further opportunities in this subprogram area include addressing performance-based risk reduction at every type of LNG facility during site location, design, construction, operations, maintenance, and fire protection activities.

Grants: $66.56 million

PHMSA provides grants to states to support inspection and enforcement activities of the nation's vast network of intrastate pipelines, including pipelines that operate in cities and neighborhoods, especially underserved communities. This partnership allows states to inspect pipeline systems, offer input into the design of community safety programs, and provide more economical oversight of intrastate facilities. The amounts requested for each of the programs are listed below:

State Pipeline Safety Grants, $58.00 million: The State Pipeline Safety Grant program supports state

inspections of pipeline facilities that run within the state. The grants also support nine states which act as agents for PHMSA, inspecting pipelines crossing state boundaries. PHMSA is authorized to reimburse states for up to 80 percent of the cost of carrying out their pipeline safety programs, including inspection staff and equipment costs. Reimbursement under this grant program is based on the costs incurred by a state and the effectiveness of its pipeline safety program, as determined by PHMSA's evaluation of the state's performance.

Each year, PHMSA evaluates the quality of state programs and the safe operation of intrastate pipelines by scoring state programs through the annual Program Evaluation and Progress Report. This evaluation includes an on-site review of the state's records and activities related to inspections, compliance, accident investigations, training, and excavation damage prevention. PHMSA also reviews the states' inspection of new pipeline construction and the implementation of pipeline operator integrity management systems designed to prevent accidents and spills.

Currently the State Pipeline Safety Grant program funds nearly 385 gas and 47 hazardous liquid pipeline state inspectors. All states except Alaska and Hawaii participate in PHMSA's pipeline safety program.

State One-Call Grants, $1.06 million: The State One-Call Grant program enhances public safety, protects the environment, minimizes risks to excavators, and prevents disruption of vital public services by reducing the incidence of excavation damage to underground facilities. States must demonstrate their compliance and alignment with 49 U.S.C. 6106(a) goals for improving state damage prevention programs.

In FY 2020, PHMSA awarded a total of $1,058,001 in State One-Call Grants to support 39 projects in 26 states. Goals of the program are to improve:

1) Overall quality and effectiveness of One-Call notification systems in the state
2) Communications systems linking One-Call notification systems
3) Location capabilities, including training personnel and developing and using location technology;
4) Record retention and recording capabilities for One-Call notification systems;
5) Public information and education;
6) Participation in One-Call notification systems; and
7) Compliance and enforcement under the state one-call notification program.

State Damage Prevention Grants, $1.5 million: The State Damage Prevention Grants were designed with a two-fold purpose: 1) establish comprehensive State programs to prevent excavation damage to underground pipeline facilities in States that lack these programs, and 2) improve and enhance existing state damage prevention programs.

To qualify for this grant, stakeholders engage cooperatively as a group to evaluate their state's damage prevention program. It is a collaborative effort between PHMSA and external stakeholders to develop a damage prevention program that effectively incorporates the nine safety elements established in the PIPES Act.

Once the grantees receive their state damage prevention grants funds, it is their responsibility to execute the nine elements below:

1) Enhanced communication between operators and excavators;
2) Fostering support and partnership among all stakeholders;
3) Operator's use for performance measures for pipe locators *(equipment that help to locate pipes and cables underground easier and faster)*;
4) Partnership in employee training;
5) Partnership in public education;
6) Fair and consistent enforcement of the law;
7) Use of technology to improve the locating process;
8) Enforcements' agencies role to help resolve issues; and
9) Data analysis to continually improve the program effectiveness.

See Pipeline Locator Below

Following through with each of these recommendations will ensure an effective, efficient and reliable underground utilities network.

Underground Natural Gas Storage Grants, $6.00 million: PHMSA reimburses inspection costs to states participating in the program. Thirty-one states have intrastate underground natural gas storage facilities. States may qualify for reimbursement if their inspection programs have already received PHMSA certification. As with the long-established State Pipeline Safety Grants program, Underground Natural Gas Storage Facility Safety Grants pay up to 80 percent of the qualifying costs related to inspections, enforcement, personnel and equipment. Overall, this program will ensure safety, promote a clean environment, and drive economic growth by allowing the safe and efficient flow of underground natural gas.

What benefits will be provided to the American public through this request and why is this program necessary?

Pipelines cross through thousands of communities in every state. Congress has entrusted PHMSA to protect the safety of millions of Americans who live and work around pipelines, especially those in underserved communities. To that end, the requested funding will provide PHMSA with resources to support the safe delivery of energy and other products via 2.8 million miles of pipelines. This will protect the natural environment, help reduce greenhouse gas emissions, and promotes economic and job growth.

Trust Fund Share of Pipeline Safety

APPROPRIATIONS EXPLANATION

TRUST FUND SHARE OF PIPELINE SAFETY

(OIL SPILL LIABILITY TRUST FUND)

The Oil Spill Liability Trust Fund was created by the United States Congress to help fund efforts designed to minimize oil spills into the water and environmentally sensitive areas. Funding from the Oil Spill Liability Trust Fund pays for Hazardous Liquid costs of the Office of Pipeline Safety program including all oil spill response activities. This section provides additional information about the fund. Funding from the Oil Spill Liability Trust Fund is accounted for by an expenditure transfer from which obligations are made and tracked separately from other pipeline safety funds.

EXHIBIT III-1
TRUST FUND SHARE OF PIPELINE SAFETY
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2020 ACTUAL	FY 2021 ENACTED	FY 2022 PRESIDENT'S REQUEST
Operations	$ 11,933	$ 11,000	$ 13,650
Research and Development	3,000	3,000	3,000
Grants	8,067	9,000	11,000
TOTAL	$ 23,000	$ 23,000	$ 27,650
FTEs			
Direct Funded	-	-	-

Program and Performance Statement

PHMSA has multiple responsibilities to inspect, investigate failures, regulate, and research hazardous liquid pipelines. In addition, PHMSA collects and reviews oil spill response plans prepared under the Oil Pollution Act of 1990. Operators that store, handle, or transport oil are required to develop response plans to minimize the environmental impact of oil spills and improve incident response. PHMSA reviews these plans to make sure that they are submitted on time, updated regularly, and that they comply with regulations. PHMSA improves oil spill preparedness and incident response through data analysis, inspections, spill monitoring, pipeline mapping in areas unusually sensitive to environmental damage, and by advancing technologies to detect and prevent leaks from hazardous liquid pipelines. These activities are funded in part by the Oil Spill Liability Trust Fund.

Detailed Justification for the Trust Fund Share of Pipeline Safety

What is the request and what funds are currently spent on the program?

FY 2022 – Oil Spill Liability Trust Fund Budget Request
(Included in the Pipeline Safety Account)
($000)

Program Activity	FY 2020 Actual	FY 2021 Enacted	FY 2022 Request
Operations	$ 11,933	$ 11,000	$ 13,650
Research and Development	3,000	3,000	3,000
Grants	8,067	9,000	11,000
Total	**$ 23,000**	**$ 23,000**	**$ 27,650**

What is this program and why is it necessary?

The Oil Spill Liability Trust Fund was created by the United States Congress to finance efforts to prevent, remove, and mitigate damage from oil spills into the water and environmentally sensitive areas. Funding from the Oil Spill Liability Trust Fund is used to cover the costs of the following: Oversight responsibilities for Hazardous Liquid pipeline operators by PHMSA including pipeline integrity management; pipeline compliance inspection and enforcement; emergency preparedness related to pipeline spills and incidents; training, competency standards, and qualifications for inspection, enforcement and operation of pipelines; state pipeline safety grants for intrastate oil pipelines; and pipeline research and development. The Fund contribution amount is based on a reasonable share of the cost of these activities for pipelines in and around inland waterways.

In FY 2022, the Oil Spill Liability Trust Fund (Trust Fund) will contribute $27.65 million to the overall Pipeline Safety program. The amount funds any cost PHMSA incurs to regulate and check safe operation of hazardous liquids pipeline operators as well as funding grants to state partners' inspection programs, and research. Over the last 12 years the Trust Fund contribution has increased 22% while the pipeline user fees have increased 125%.

The FY 2022 Budget request proposes to increase the Trust Fund share by $4.65 million, reducing the pipeline operators' user fees by the same amount. This will better align trust fund contributions with the increase in operators' costs, thereby spurring economic recovery while still providing substantial environmental benefits.

The Oil Spill Liability Trust Fund is a source of funding for the Pipeline Safety Fund. It specifically funds costs related to PHMSA's hazardous liquid program including inspections, safety operations, regulations development, adjudication of violations and fines, grant programs that fund state inspections, and any responsibilities under the Oil Pollution Act.

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Hazardous Materials Safety

APPROPRIATIONS LANGUAGE

HAZARDOUS MATERIALS SAFETY

For expenses necessary to discharge the hazardous materials safety functions of the Pipeline and Hazardous Materials Safety Administration, [$62,000,000] *$69,029,000* to remain available until September 30, [2023] *2024*: Provided, That up to $800,000 in fees collected under 49 U.S.C. 5108(g) shall be deposited in the general fund of the Treasury as offsetting receipts: Provided further, That there may be credited to this appropriation, to be available until expended, funds received from States, counties, municipalities, other public authorities, and private sources for expenses incurred for training, for reports publication and dissemination, and for travel expenses incurred in performance of hazardous materials exemptions and approvals functions.

EXHIBIT III-1

Hazardous Materials Safety
SUMMARY BY PROGRAM ACTIVITY
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2020 ACTUAL	FY 2021 ENACTED	FY 2022 REQUEST
Operations	$ 52,430	$ 55,930	$ 60,459
Research and Development	7,570	5,070	7,570
Grants	1,000	1,000	1,000
TOTAL	$ 61,000	$ 62,000	$ 69,029
FTEs			
Direct Funded	197.0	203.0	213.0

Program and Performance Statement

PHMSA's Hazardous Materials Safety program is responsible for the oversight of the safe transportation of hazardous materials. The program relies on comprehensive risk management to establish policy, standards and regulations for classifying, packaging, hazard communication, handling, training and transporting hazardous materials via air, highway, rail and vessel. The program uses inspection, enforcement, outreach and incident analysis in efforts to reduce incidents, minimize fatalities and injuries, mitigate the consequences of incidents that occur, train and prepare first responders, and enhance safety.

EXHIBIT III-1a
Hazardous Materials Safety
SUMMARY ANALYSIS OF CHANGE FROM FY 2021 TO FY 2022
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	FTE
FY 2021 ENACTED	$ 62,000	203.0
ADJUSTMENTS TO BASE:		
Annualization of FY 2021 FTE	-	-
Annualization of Prior Pay Raises (3.1%)	125	-
FY 2022 Pay Raises (2.7%)	681	-
GSA Rent	-	-
Working Capital Fund	(20)	-
Inflation and Other Adjustments to Base	593	-
Adjustment for Compensable Days (261 days)	-	-
SUBTOTAL, ADJUSTMENTS TO BASE	**1,379**	**-**
PROGRAM REDUCTIONS		
None	-	-
SUBTOTAL, PROGRAM REDUCTIONS	**-**	**-**
PROGRAM INCREASES		
Add 20 Positions (10 FTE) for Outreach	2,150	10.0
Increase Hazmat State Program	1,000	
Research & Development	2,500	
SUBTOTAL, PROGRAM INCREASES	**5,650**	**10.0**
FY 2022 REQUEST	**$ 69,029**	**213.0**

Detailed Justification for Hazardous Materials Safety

FY 2022 – Hazardous Materials Safety Budget Request
($000)

Program Activity	FY 2020 Actual	FY 2021 Enacted	FY 2022 Request
Operations	$ 44,043	$ 44,332	$ 48,492
Contract Safety Programs	8,387	11,598	11,967
Research and Development	7,570	5,070	7,570
Grants	1,000	2,500	1,000
Total	**$ 61,000**	**$ 62,000**	**$ 69,029**
FTEs	**203.0**	**203.0**	**213.0**

What is this program and what does this funding level support?

Key Hazardous Materials Safety Request Highlights:

- **$3.5 million State Hazardous Materials Inspection Program (Hazardous Materials Safety)**— to conduct state-based **safety inspections of hazardous materials shippers**, which will leverage state resources to **improve safety of hazardous materials transport** and **reduce fatalities/injuries**. As the number of hazardous materials shipments continue to increase year-over-year (projected 44% increase in non-electric vehicle lithium batteries, and 38% increase in electric vehicle batteries by 2025), there is a much greater demand to ensure safe transport—this additional funding will allow states and localities and their first responders to keep up with demand.
- **$2.2 million Hazardous Materials Planning Outreach (Hazardous Materials Safety)—** for 20 positions to **address economic inequity and reduce transportation costs** through Hazardous Materials Planning Outreach to **economically disadvantaged communities**. Through the Emergency Preparedness grants program, PHMSA will outreach to Local Emergency Planning Communities (LPECs), which are often in economically distressed areas, allowing them to make better and safer decisions about managing hazardous materials transportation risk, thereby keeping communities safer.

Many products used in homes and gardens, farms, vehicles, and industry are potentially dangerous if improperly packaged or unsafely transported. PHMSA's mission is to protect people and the environment by advancing the safe transportation of hazardous materials that are essential to our daily lives. The Hazardous Materials Safety program serves PHMSA's mission by focusing on the classification, packaging, hazard communication, handling, training, and transport requirements for hazardous materials transported by air, highway, rail, and vessel.

In our interconnected and highly developed transportation network, hazardous materials move by all modes of transport and are transported in a number of ways—from bulk quantities of raw materials down to small consumer quantities of finished products. A single package may be transported by multiple modes from its point of origin to its destination. PHMSA's guidance provides the critical connection that enables end-to-end consistency and interoperability throughout the transportation system. Our work force fosters a high degree of transportation safety while facilitating trade and economic growth by eliminating the potential for overlapping regulatory burdens that could impede commerce, and by ensuring that products make it to their intended destination efficiently and safely.

The movement of hazardous materials is inherently dangerous. More than 3.3 billion tons of hazardous materials valued at more than $1.9 trillion are transported annually by air, highway, rail, and vessel. On average, more than 1.2 million hazardous materials shipments occur every day. Fueled by domestic demand for lithium-ion battery powered electronics and international demand for American energy products and chemicals, the total volume, number of shipments, and value of hazardous materials shipments is expected to continue increasing, especially with the recent rise of e-commerce during the COVID-19 pandemic. PHMSA works to promote the safety of all who come in contact with hazardous materials and maintain a system where hazardous materials are packaged and shipped without incident. The program accomplishes this with a variety of packaging and transportation safety standards, safety checks, and outreach to the packaging and shipping industries. Hazardous materials shipped include flammable liquids such as oil and gas, liquefied natural gas (LNG), explosives, flammable solids, oxidizing substances and organic peroxides, infectious substances (e.g. COVID-19 samples or cultures), lithium-ion batteries, corrosive substances, and radioactive materials.

Clear labeling with placards and graphics is central to reducing hazardous materials risk

PHMSA provides safety standards for the transportation of energy products so they arrive safely and without incident. New extraction of natural gas and crude oil has transformed the domestic energy landscape–for example, in 2020, United States (U.S.) crude production reached 12.9 million barrels per day, with a corresponding surge in high-volume rail shipments of energy products. Similarly, growth in U.S. natural gas production has driven the development of many large- and small-scale liquefaction facilities to store natural gas in a compact liquid state while awaiting delivery to market. This growth has resulted in the increased use of rail, road, and vessel transport. PHMSA's research and regulatory processes set safety standards for the transportation of these materials using scientific data. The agency is also focused on

opportunities to reduce greenhouse gas emissions through improvements in transportation processes. Finally, PHMSA coordinates with international colleagues to enable cross-border transport of energy products by rail and truck to ensure safety standards are consistently applied and result in a safe delivery to the neighboring country.

PHMSA also oversees the safe transport of lithium batteries that have become integral to almost everything we do and use, but that also pose risk during transportation. PHMSA convened a Federal Advisory Committee to examine the issues surrounding the safe transport of lithium batteries and will consider the committee recommendations, while also tracking new developments in battery technology, including emerging sodium-ion batteries. Through PHMSA's oversight, we help ensure the safety of everyone who comes in contact with lithium batteries and promote economic growth throughout the Nation by the efficient transport of these products.

As the nation's use of hazardous materials grows, so do the risks that come with transporting these materials. PHMSA is constantly challenged to develop new strategies for ensuring hazardous materials safety. The rise of e-commerce has transformed hazardous materials transportation from large, bulk shipments that occupied whole trucks, train cars, or intermodal containers to individual shipments that are being delivered sometimes directly to a consumer's home. These changes in buying, shipping, and transportation require new and innovative strategies to ensure the safety of the transportation system and the public.

PHMSA relies on two primary strategies to address safety. First, keep the hazardous materials in their packages by ensuring the material is properly classified and that packages for hazardous materials are constructed to rigorous safety standards and, where appropriate, are periodically tested to ensure continued viability. Second, PHMSA works to ensure that first responders are adequately prepared to mitigate the consequences of any incidents through adequate information and training. This is especially important as many hazardous materials are sited in or transported through underserved communities. Meeting safety objectives requires that PHMSA continue to support safe packaging, train first responders, and invest in promising research and development that solves complex packaging challenges.

PHMSA's research informs safety standards for the movement of dangerous products**.** PHMSA's Hazardous Materials Research and Development program is designed to solve complex problems in the packaging and movement of hazardous materials. This includes researching and identifying best practices regarding hazardous materials transport with a better classification of the most dangerous products, development of new packaging materials and methods to contain those products, and conducting engineering and scientific analysis to promote economic growth while improving safety. Recently completed research on lithium-ion batteries has led to the development of a battery health monitoring device that can anticipate potential shipment issues without affecting packaging weight. PHMSA continues to review and communicate hazards tied to lithium-ion batteries in both cargo and passenger aircraft, as that mode of transportation poses the greatest threat to the public. Significant emphasis is placed on finding innovative ways to enhance safety and improve commerce.

Research for FY 2022 will focus on the following strategic areas:

- Risk management and mitigation,

- Package integrity,
- Emerging technologies, and
- Technical analysis to aid risk assessments.

Specific emphasis will be placed on emerging battery safety issues with lithium and sodium-ion batteries, examining the safety of "nurse" tanks that transport anhydrous ammonia to America's farmers, continuing to look into safer methods for transporting energy products such as hydrogen and liquefied natural gas (LNG), and continuing to refine best practices for responding to hazardous materials incidents by updating the Emergency Response Guide Book. Much of PHMSA's hazardous materials research is done cooperatively with government and industry entities with a focus on near-term solutions to evolving hazardous materials related transportation challenges.

To continue the safe movement of hazardous materials, PHMSA requests $68.96 million for the Hazardous Materials Safety program as follows:

Operating Expenses: $48.5 million

PHMSA's fiscal year (FY) 2022 request includes $48.5 million for hazardous materials safety-related operating expenses to support the cost of 223 positions (213 FTE): 78 inspectors and 145 safety program, scientific, and safety standard development staff. These staff work with the energy industry on the safe movement of energy products, and hazardous materials packagers and shippers of such products as lithium batteries, fireworks, hand sanitizers, and dangerous goods such as chlorine and other toxic chemicals, radioactive, infectious substances, and explosives. Operating expenses cover salaries and benefits, travel, training, supplies, equipment and uniforms for all inspectors. The request also includes investments in PHMSA's core business areas of Inspection, Investigation, Compliance and Safety Management.

PHMSA is requesting resources to support Local Emergency Planning Committees 10.0 FTE/20 FTP, $2.2 million for FY 2022.

The funding request provides 20 positions (10 FTE) to conduct outreach to disadvantaged communities to help connect them with the strategies and resources available to improve hazardous materials transportation planning and response plans. Local Emergency Planning Committees (LEPCs), particularly in economically disadvantaged communities, frequently do not have awareness of hazardous materials risks in transportation within their communities or the available tools to allow them to develop robust response plans, ensure emergency responders get appropriate training, and make informed generational decisions about siting critical infrastructure (hospitals, schools, senior living, assisted housing) away from transportation risk. Further, disadvantaged communities are disproportionately impacted as they are frequently located adjacent to major transportation routes (railways and interstate highways). PHMSA will use the requested staff to identify communities in need of assistance and provide education and technical assistance to those communities in developing and implementing robust emergency response plans.

Contract Safety Programs: $12.0 million

PHMSA's Contract Safety programs include the cost of contracted support as follows:

The Investigation and Enforcement program supports the PHMSA inspection and investigative staff, located mostly in the PHMSA regional offices. These contracts provide for package testing, technical support, uniforms, and equipment needed to test hazardous materials such as radioactive substances. PHMSA inspectors conduct hazardous materials surveys. An example of this type of survey is one completed at the FedEx Memphis World Hub in May, 2020. This location processes roughly 800,000 shipments per day, including some shipments of hazardous materials. PHMSA inspectors worked with FedEx employees to ensure that hazardous packages are safe for delivery.

State Hazardous Materials Safety Inspections. PHMSA is requesting $1.0 million to provide States with the resources to conduct safety inspections of hazardous materials shippers. In FY 2020 PHMSA received $2.5 million to establish a State Hazardous Materials Safety Inspection Program. In FY 2021, PHMSA expects to complete work on the framework and information collection systems to support the program, continue funding inspections in the two States to join the program and bring on an addition one to three States. Funding will provide reimbursement of shipper inspection costs, develop a certification for State hazardous materials packaging and shipping inspection programs, and develop and maintain information technology systems to support data collection and analysis of State hazardous materials inspection programs. This will improve the safety of hazardous materials shipments Nationwide.

The Hazardous Materials Information and Analysis program informs policy and decision-making by collecting and analyzing data from each of the approximately 20,000 hazardous materials transportation incident filings that are submitted to PHMSA every year. Upon receipt, these filings are reviewed in an ISO 9001:2015-compliant quality control workstream and subsequently augmented by data mining of public sources for unreported incidents. Data forensics are then performed to determine the root cause of the incident. This data is used to target enforcement and outreach activity, determine the efficacy of rulemakings, push innovation towards high-impact areas, and to evaluate programmatic success through PHMSA's key priority areas.

The Outreach, Training and Compliance program provides outreach, education, and training to communities and first responders on hazardous materials safety while also enhancing compliance by hazardous materials packagers and shippers with safety standards and regulations.

PHMSA plans to drive improvements in the safe delivery of hazardous materials by investing in a new training and certification program for States to conduct inspections for hazardous materials transport by all modes other than pipelines. Industry, State inspectors, and first responders rely on PHMSA for guidance and training on how to move dangerous products safely. For example, PHMSA's innovative advertising campaign to sellers, "Check the Box", promotes the need for e-commerce retailers and sellers to check the safe packaging requirements before they send products to consumers. The rapid growth of e-commerce sellers makes this campaign even more critical.

The investment will provide a robust training curriculum to be delivered online and in-person at an expanded facility currently shared with the Pipeline Safety program. This training and certification program will provide a major expansion of PHMSA's current inspection and enforcement capabilities through engagement of State inspectors. The training and certification is expected to improve the quality and effectiveness of inspections, reduce hazardous materials incidents, increase overall safety in the transportation of hazardous materials, and promote economic growth through efficient shipment.

The Hazardous Materials Registration program collects annual registration statements and fees from over 40,0000 hazardous materials shippers. These fees provide essential funding for grants to first responders.

These programs described above advance PHMSA's mission of the safe transportation of energy and hazardous materials through monitoring Special Permit and Approval applications; the development and dissemination of educational tools for outreach; engagement with industry stakeholders and the emergency response community; and ensuring a data-driven approach to managing hazardous materials risks with its one-stop, multi-modal Hazardous Materials Intelligence Portal. These programs also support PHMSA's ability to verify and analyze incident reports submitted through the Hazardous Materials Information Communication System and the ability to obtain emergency notifications when a hazardous material incident occurs.

Research and Development: $7.57 million

Hazardous Materials Research & Development finds solutions to complex problems in the packaging and movement of hazardous materials. The Research and Development program funds multi-modal programs supporting improved packaging and equipment designs that enhance the performance of highway transport, including unmanned autonomous vehicles, rail cars, airplane cargo holds, and vessels used to transport hazardous materials. Hazardous Materials' Research and Development plans to develop a better annual hazardous material commodity flow count, supporting innovation in packaging, and enhancing shipping methods. For example, previously low-volume products that are now routinely transported in large packages will undergo shock and vibration testing. Some important projects include:

- **Safe packaging practices for lithium batteries.** Lithium batteries are regulated as hazardous materials. They pose special risks during transportation since they can overheat and ignite under certain conditions and, once ignited, can be especially difficult to extinguish. Lithium batteries present both chemical (e.g. flammable electrolyte) and electrical hazards. Lithium batteries can short circuit, overheat, and sometimes cause a fire when misused, mishandled, improperly packaged, improperly stored, overcharged or subject to failure due to latent or evolving internal defect(s). This research will evaluate the current packaging practices for lithium ion cells and batteries in the air transport environment, and make recommendations, as appropriate, for packaging improvements.

Develop annual commodity flow and packaging data through the US Census Bureau.

- **Working with the U.S. Census Bureau** to collect data on the types of packaging used in shipping hazardous materials. This data will help PHMSA quickly and precisely calculate the changing risks associated with transport of hazardous materials. The work in FY 2021 and FY 2022 will build on the findings from 50 exploratory and cognitive interviews and data collection instrument design done in FY 2020.

- **Finite Element Modeling of Nurse Tanks** to safely move hazardous liquids in rural areas and in farming applications. PHMSA's research will develop a criteria and performance model to assess and define service life for nurse tanks that transport anhydrous ammonia delivered to farms for use as fertilizer. Recently there have been several incidents involving nurse tanks that have raised questions about how PHMSA can ensure their safety as they age.

PHMSA works cooperatively with shippers, carriers, emergency responders, State and local officials, other Federal agencies that oversee transportation systems, and academic institutions in its hazardous materials research. It accomplishes this through shared development of proposals and joint funding of the most promising research.

Grant Programs: $1.0 million

Community Safety Grants

PHMSA's request in FY 2022 continues the $1.0 million for a Community Safety grants program for those most impacted by crude by rail routes and incidents, including those in economically distressed and underserved areas through which the more than 200,000 carloads of crude oil originated by U.S. Class I railroads in 2019 traveled (this was equivalent to around 397,000 barrels per day by rail).

The grant, authorized by the Fixing America's Surface Transportation (FAST) Act, is a competitive hazardous materials transportation training grant program that funds nonprofit organizations' development of best practice guidance for outreach regarding hazardous materials transportation issues. It provides funding for nonprofit outreach and training programs to train State and local personnel responsible for enforcing the safe transportation of hazardous materials.

What benefits will be provided to the American public through this request and why is this program necessary?

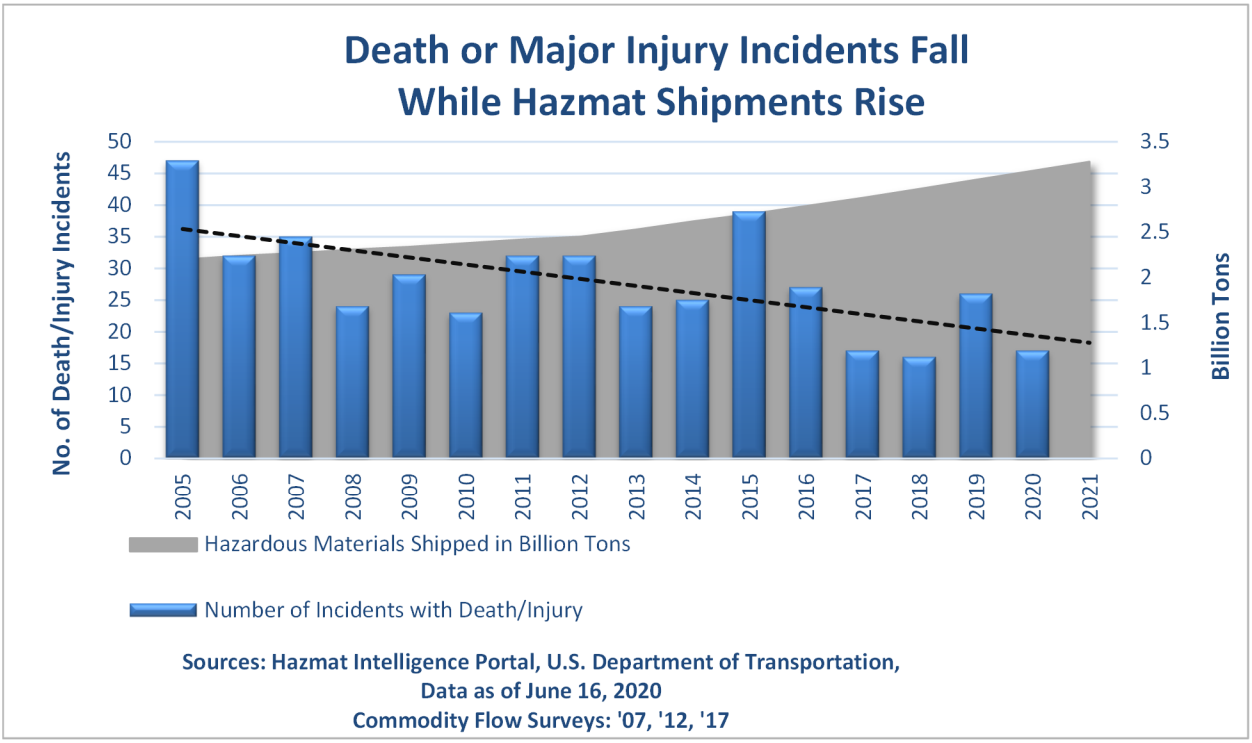
The Office of Hazardous Materials Safety provides benefits to the American public by improving safety in the packaging and shipping hazardous materials, promoting economic growth, and helping to protect economically distressed and underserved communities. Our Systems Integrity Safety Program helps companies that have systemic noncompliance; a substantially high percentage of incidents leading to deaths, injuries, and environmental releases; or present a high level of risk to the public. The program enables these companies to develop sustainable solutions by investing in themselves. This voluntary action, instead of traditional

enforcement actions, has improved compliance, achieved a higher level of safety than possible with standard processes, and leveraged limited inspector resources.

The Office of Hazardous Materials Safety inspectors have also established liaisons with senior company officials at organizations including major hazardous materials distributors and manufacturers of chemicals and packaging to correct widespread systemic problems through innovative, non-punitive methods. PHMSA does this by working with affected companies to make them aware of the problems they are experiencing, propose solutions, and periodically tracks progress. In one instance, a company reported that it recouped investments through operational cost savings and improved safety processes within three years.

PHMSA's Hazardous Materials Safety program also supports the economy through safe transport of products to market while simultaneously making communities, especially economically distressed and underserved ones, safer and more livable. An effective transportation safety program requires continuous evaluation, revitalization, and updating to address modern risks. As commerce grows, PHMSA's investment in safety also has to increase to continue upholding high safety standards. To achieve our goal of zero incidents, additional investment is needed.

As shown below, total death and major injury incidents have generally declined since 2005.



These ongoing successes cannot occur without a continuous commitment to excellence in safety. New inventions/products packaged in cutting edge/advanced packaging solutions/technologies being transported through unfamiliar ports of origin raise the stakes for safety precautions and preventative measures in the transportation of hazardous materials. PHMSA's request facilitates its ability to identify the highest risks in moving energy to domestic and international markets, technology changes, and new shipping methods. PHMSA requests $69.0 million in funding to

manage the evolving challenges of packaging and shipping hazardous materials, with a commitment to R&D to continue gathering information, solving problems and moving the U.S. hazardous materials industry forward, protecting the American people, property and ensuring the safe acceleration of our booming energy economy.

Emergency Preparedness Grants

APPROPRIATIONS LANGUAGE

EMERGENCY PREPAREDNESS GRANTS

(LIMITATION ON OBLIGATIONS)

(EMERGENCY PREPAREDNESS FUND)

[For expenses necessary to carry out the Emergency Preparedness Grants program, not more than $28,318,000 shall remain available until September 30, 2023, from**]** *In addition to* amounts made available by section 5116(h) and subsections (b) and (c) of section 5128 of title 49, United States Code *for the Emergency Preparedness Grants program*, *$1,000,000, to remain available until September 30, **[**2023**]** 2024, shall be made available from the general fund of the Treasury, in addition to amounts otherwise available for such purposes, to develop and deliver hazardous materials emergency response training for emergency responders, including response activities for the transportation of crude oil, ethanol, flammable liquids, and other hazardous commodities by rail, consistent with National Fire Protection Association standards, and to make such training available through an electronic format: Provided,* That notwithstanding section 5116(h)(4) of title 49, United States Code, not more than 4 percent of the amounts made available from this account shall be available to pay administrative costs **[**: *Provided further*, That notwithstanding subsections (b) and (c) of section 5128 of title 49, United States Code, and the limitation on obligations provided under this heading, prior year recoveries recognized in the current year shall be available to develop and deliver hazardous materials emergency response training for emergency responders, including response activities for the transportation of crude oil, ethanol, flammable liquids, and other hazardous commodities by rail, consistent with National Fire Protection Association standards, and to make such training available through an electronic format: *Provided further*, That the prior year recoveries made available under this heading shall also be available to carry out sections 5116(a)(1)(C), 5116(h), 5116(i), and 5107(e) of title 49, United States Code.**]** *of carrying out sections 5116, 5107(e), and 5108(g)(2) of such title.*

ADMNISTRATIVE PROVISIONS

[Sec. 180 In addition to the amounts made available under the heading, "Emergency Preparedness Grants", $1,000,000, to remain available until September 30, 2023, shall be made available to the Pipeline and Hazardous Materials Safety Administration from the general fund of the Treasury, in addition to amounts otherwise available for such purposes, to develop and deliver hazardous materials emergency response training for emergency responders, including response activities for the transportation of crude oil, ethanol, flammable liquids, and other hazardous commodities by rail, consistent with National Fire Protection Association standards, and to make such training available through an electronic format.]

EXHIBIT III-1
Emergency Preparedness Grants
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2020 ACTUAL	FY 2021 ENACTED	FY 2022 REQUEST
Operations	$ 555	$ 603	$ 603
Grants	27,763	28,715	28,715
TOTAL	$ 28,318	$ 29,318	$ 29,318
FTEs			
Direct Funded	0	0	0

Program and Performance Statement

PHMSA operates a national registration program for shippers and carriers of hazardous materials and collects a fee from each registrant. The fees collected are used for emergency preparedness planning and training grants; publication and distribution of the Emergency Response Guidebook; development of training curriculum guidelines for emergency responders and technical assistance to States, political subdivisions, and federally recognized tribes; and administrative costs for these programs.

EXHIBIT III-1a

Emergency Preparedness Grants
SUMMARY ANALYSIS OF CHANGE FROM FY 2021 TO FY 2022
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	FTE
FY 2021 ENACTED	$ 29,318	-
ADJUSTMENTS TO BASE:		
None		
SUBTOTAL, ADJUSTMENTS TO BASE	-	-
PROGRAM REDUCTIONS	-	
None		
SUBTOTAL, PROGRAM REDUCTIONS	-	-
PROGRAM INCREASES		
None	-	
SUBTOTAL, PROGRAM INCREASES	-	-
FY 2022 REQUEST	**$ 29,318**	-

Detailed Justification for Hazardous Materials Emergency Preparedness Grants

FY 2022 – Hazardous Materials Emergency Preparedness Grants Budget Request ($000)

Program Activity	FY 2020 Actual	FY 2021 Enacted	FY 2022 Request
Operations	$ 555	$ 603	$ 603
Grants	$ 27,763	$ 28,715	$ 28,715
Total	**$ 28,318**	**$ 29,318**	**$ 29,318**

What is this program and what does this funding level support?

Over the past decade, there has been tremendous growth in the shipment of hazardous materials throughout the nation. Today, more than 2.7 billion tons of hazardous materials valued at more than $3.1 trillion are transported annually by air, highway, rail, and vessel. On average, more than 1.2 million hazardous materials shipments occur every day. Fueled by domestic demand for lithium-ion battery powered electronics and international demand for American energy products and chemicals, the total volume, number of shipments, and value of hazmat shipments is expected to continue increasing—particularly with an influx of new electric vehicles in the marketplace. Thus, carrier movement of hazardous materials has increased dramatically on roads and waterways, and by rail, within the United States. Communities impacted by hazardous materials shipments need to train and prepare first responders to control and contain accidents and incidents involving hazardous materials. And often these are economically distressed, historically underserved communities.

Congress, through the Fixing America's Surface Transportation (FAST) Act of 2015, recognized the need for the support of communities and first responders most affected by this growth. Funding for the program comes from approximately 40,000 hazardous materials shippers' (truckers, rail companies, and airlines) registration fees. The monies collected aid community planning for unique risks of hazardous material accidents/incidents, and is especially needed for first responders due to the increased risk of hazardous materials freight passing through their neighborhoods. The program funds local firefighters' and other first responders' training, across all 50 States and territories, on the response and remediation of difficult hazardous materials fires and incidents. This program will also promote racial justice and equity by better preparing and equipping first responders in economically distressed and underserved communities, which are often hardest hit by hazardous materials incidents.

In fiscal year 2022, PHMSA requests budget authority of $29.32 million for the Emergency Preparedness Grants program. This allows PHMSA to continue important emergency preparedness training and planning grants, technical assistance to grant recipients, and the printing of the *Emergency Response Guidebook*.

Operations: $603 thousand

Operations includes the costs to manage the emergency preparedness and grants programs including creating training modules for grantees and first responders, and support for the review of State plans for improving local response to hazardous materials shipments, routes, and incidents.

Grants Program: $28.72 million

Emergency Preparedness Grants provide Federal financial and technical assistance to States, territories and federally recognized tribes to develop, improve, and carry out emergency plans.

Grants include the cost of the following programs:

- Hazardous Materials Emergency Preparedness (HMEP) Grants, $22.00 million,
- Hazardous Materials Instructor Training (HMIT) Grants, $4.00 million,
- Assistance for Local Emergency Response Training, $1.00 million,
- Supplemental Public-Sector Training Grants, $988 thousand,
- Emergency Response Guidebook, $586 thousand, and
- Oversight and Technical Assistance, $141 thousand.

Hazardous Materials Emergency Preparedness Grants, $22.00 million
The training and planning grants are distributed among States through a formula that factors in population density; the frequency and costs associated with serious and non-serious incidents; and mode(s) of transportation involved in previous hazardous materials accidents/incidents. These grants are awarded to States that provide funding to localities and first responders most in need of planning and training. In the 2018 Report to Congress, PHMSA reported the Hazardous Materials Emergency Preparedness grants funded training of over 102,000 emergency responders and funded the update or development of over 1,300 emergency response plans, performance of 1,134 emergency response exercises, and completion of 124 commodity flow studies.

Hazardous Materials Instructor Training (HMIT) Grants, $4.00 million
The HMIT Grants program provides funding to train hazardous materials safety employees to become instructors and develops tools to extend the reach of hazardous materials training. These grants are awarded to nonprofit organizations with expertise in training hazardous materials safety employees. In 2019 more than 2,700 hazardous materials employees and instructors were trained.

Assistance for Local Emergency Response Training (ALERT) Grants, $1.00 million
Local emergency responders are on the frontlines protecting people, property and the environment from the harmful effects of hazardous pipeline accidents or incidents. According to the International Association of Fire Chiefs, 60 percent of the Nation's fire departments provide hazmat and pipeline emergency response. The $1.00 million for Emergency Response grants to State and local governments will provide safety training programs preparing first responders for hazardous materials and pipeline incident response. Currently PHMSA has been made aware of a training gap that disproportionately affects rural communities, where nearly 80 percent of fire departments do not have formal training. PHMSA will expand emergency response grants to rural communities, to the extent permissible under current law,

and work with relevant authorizing committees to expand grant eligibility to non-profit organizations providing emergency response training and to areas outside of high consequence areas. This focused training will protect the environment and promote economic growth by mitigating the negative effects of hazardous materials incidents.

PHMSA will continue to enhance its training curriculum for local emergency responders, including response activities for crude oil, ethanol, and other flammable liquids transported by rail. PHMSA also aims to train public-sector emergency response personnel in communities on or near rail lines, which transport a significant volume of high-risk energy commodities or toxic inhalation hazards. These are often economically distressed and underserved communities which are the least able to absorb the negative impact of hazardous materials incidents.

Supplemental Public Sector Training Grants, $988 thousand
These grants help train hazardous materials training instructors so they are well versed in the best practices in modern hazardous material incident remediation. These grants are made to national, nonprofit fire service organizations.

The grant programs provide funding to States, localities, and local fire and rescue centers managing hazardous materials shipping routes in their communities. Recipients of these funds train first responders in identifying and containing leaked chemicals and extinguishing dangerous fire substances. These subsidies are also used to develop and/or revise emergency plans for bulk transportation of energy products by rail and over the road.

In addition, the Hazardous Materials Emergency Preparedness Grants program supports State, local and tribal hazardous materials training initiatives through the publication of *Guidelines for Response, Planning and Prevention Training for Incidents Involving Hazardous Materials and Weapons of Mass Destruction.*

Emergency Response Guidebook, $586 thousand
PHMSA develops, publishes and distributes an updated version of its *Emergency Response Guidebook (ERG)* every four years (both paperback and electronic versions). The *Emergency Response Guidebook* is developed jointly by the U.S. Department of Transportation, Transport Canada and the Secretariat of Communications and Transportation of Mexico for use by first responders. The guidebook is for initial actions to be taken to protect first responders and the public during hazardous materials incidents (see http://www.phmsa.dot.gov/hazmat/library/erg). The *Emergency Response Guidebook* is widely used by the transportation industry and is internationally recognized.

Since 1993, 16 million copies of the *Emergency Response Guidebook* have been published and distributed. It is the primary resource for the Nation's first responders, and is the globally recognized authority in hazardous materials containment, having been translated into more than a dozen languages. *Emergency Response Guidebooks* are present in almost every emergency response vehicle in the United States.

Oversight and Technical Assistance, $141 thousand
The FAST Act requires the Department to provide technical assistance to a State, its political subdivisions or federally recognized tribes for carrying out emergency response training and planning for incidents involving hazardous materials. PHMSA does this through on-site visits, technical assistance visits and outreach including web-based and media engagements.

What benefits will be provided to the American public through this request and why is this program necessary?

It has been proven that grant programs supporting emergency preparedness have resulted in lower rates of hazardous materials transportation-related deaths, major injuries, and significant damage to property and the environment. Studies have shown that low impact incidents can be attributed to well-trained first responders and their ability to identify hazardous materials spilled, secure a site, and extinguish hazardous material fires.

Hazardous materials employees and emergency responders also benefit from qualified training instructors. These grants help ensure workplace safety and compliance when transporting hazardous materials and provide training to firefighters across the Nation to ensure a safe and efficient response to hazardous material incidents. Every year selected nonprofit organizations instruct thousands of such trainers and hazardous materials employees on the rules, regulations and best practices on the containment of hazardous materials accidents/incidents.

Emergency preparedness and response training are vital components to the Nation's first responders and the American public's safety. Effective preparation for emergencies help prevent and/or contain the impact(s) of hazardous materials incidents/accidents, saving lives and reducing environmental damage every year.

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Operational Expenses

APPROPRIATIONS LANGUAGE

OPERATIONAL EXPENSES

For necessary operational expenses of the Pipeline and Hazardous Materials Safety Administration, [$28,715,000] *$29,100,000* of which $4,500,000 shall remain available until September 30, [2023] *2024*.

EXHIBIT III-1
Operational Expenses
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2020 ACTUAL	FY 2021 ENACTED	FY 2022 REQUEST
Operations	$ 22,715	$ 24,215	$ 24,600
Grants	$ 1,500	$ 4,500	$ 4,500
TOTAL	$ 24,215	$ 28,715	$ 29,100
FTEs			
Direct Funded	69.0	70.0	68.0

Program and Performance Statement

The success of the PHMSA safety programs is dependent on effective support organizations that hire staff, acquire goods and services, develop and sustain information technology, write complex safety regulations, and support enforcement actions, among others. PHMSA provides support through the Offices of the Administrator, Deputy Administrator, Executive Director/Chief Safety Officer; Planning and Analytics; Chief Counsel; Governmental, International and Public Affairs; Chief Financial Officer, Budget and Finance, Acquisition and Information Technology Services; Associate Administrator for Administration, Administrative Services, Human Resources; and Civil Rights.

EXHIBIT III-1a

Operational Expenses
SUMMARY ANALYSIS OF CHANGE FROM FY 2021 TO FY 2022
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	FTE
FY 2021 ENACTED	28,715	70.0
ADJUSTMENTS TO BASE:		
Annualization of FY 2021 FTE	-	-
Annualization of Prior Pay Raise(s)	49	-
FY 2022 Pay Raise	277	-
GSA Rent	(18)	-
Working Capital Fund	(177)	(2.0)
Non-Pay Inflation	254	-
Adjustment for Compensable Days (261 days)	-	-
SUBTOTAL, ADJUSTMENTS TO BASE	**385**	**- (2.0)**
FY 2022 REQUEST	**$ 29,100**	**68.0**

Detailed Justification for the Operational Expenses Program

FY 2022 Operational Expenses Budget Request
($000)

Program Activity	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Request
Operations	$ 18,628	$ 19,643	$ 20,443
Contract Safety Programs	4,087	4,572	4,157
Grants	1,500	4,500	4,500
Total	**$ 24,215**	**$ 28,715**	**$ 29,100**
FTEs	**69.0**	**70.0**	**68.0**

What is this program and what does this funding level support?

The Pipeline and Hazardous Materials Safety Administration's mission is to ensure the safe transportation of hazardous materials across all modes of transportation and through pipelines. The Operational Expenses account provides resources that support a world-class safety organization—regulatory and enforcement support, information technology systems, human resources, financial management, grants administration and acquisition services, among others. Through these activities, PHMSA helps preserve the environment and supports a robust economy that relies on products arriving safely without adverse consequences.

The Protecting Our Infrastructure of Pipelines Enhancing Safety (PIPES) Act of 2020 reauthorized PHMSA's pipeline safety programs for three years and provided important advances in new safety technology and regulatory reform, including 36 new regulatory actions.

Operations: $20.4 million

PHMSA's FY 2022 operations' request of $20.4 million supports the safety organization, funds the Department of Transportation's shared costs through the Working Capital Fund, and equips our safety staff with the tools and technology necessary to operate a first- rate safety organization. About 70 percent of these funds specifically cover salaries and benefits, equipment, rent, travel, training, supplies and other important efforts such as working to implement the Administration's critical goals and priorities.

This includes funding for several critical agency priorities such as:

- **Continuing an investment in leadership development** by **building a cadre of safety leaders** for PHMSA in FY 2022 and beyond via new and existing agency-wide leadership development

programs. The agency has already successfully delivered both advanced and intermediate leadership development programs and is launching a beginner program.

- **Developing recruitment and retention programs** to ensure that PHMSA can **attract and retain the highest-quality safety professionals**. The PIPES Act directs PHMSA to provide incentives for tuition reimbursement, student loan repayment and special pay rates. PHMSA is focusing on standing up these critical programs**.** This will ensure a strong and stable safety workforce, promote succession planning, and allow PHMSA to fully execute its safety mission.

Contract Safety Programs: $4.2 million

PHMSA's request for contract safety programs in the Operational Expenses account is $4.2 million. The information technology contract program serves as the foundation for PHMSA to develop modern data systems that operate safely and free from cybersecurity threats. This includes data systems that quantify incidents and accidents, associate causality, and predict future trends and events. The systems ensure the timely processing of certain special permits and approvals. The funding also supports all IT used at headquarters and some of the regional support. Each year, PHMSA also has to account for operations and maintenance funds to keep the information technology infrastructure running smoothly. These support systems are critical to maintaining a well-run organization capable of carrying out the agency's essential safety mission.

Grants: $4.5 million

PHMSA's request for Grants programs is $4.5 million to continue funding the Emergency Response and Information Grants to Communities programs.

Emergency Response Grants - $2.5 million

PHMSA requests funding for making grants to State, county, and local governments in high consequence areas, as defined by the Secretary, for emergency response management, training, and technical assistance. Local emergency responders are the first to show up when it comes to protecting people, property and the environment from the harmful effects of hazardous pipeline accidents or incidents. There is however a training gap that needs to be closed especially in rural communities, where 80 percent of fire departments do not have formal emergency response training. Grants to train emergency responders will assist PHMSA in addressing this need in accordance with existing regulations, and will ensure the safety of people in these communities, protect the environment from harm, and promote economic growth through the safe movement of hazardous liquid and gas.

Information to Grants to Communities - $2.0 million

The funding supports Pipeline Safety Information Grants to Communities for technical assistance related to communities impacted by pipeline projects and facilities. The awards have funded a broad range of activities, including:

- Improvement of local pipeline emergency response capabilities;
- Improvement of safe digging programs;
- Development of pipeline safety information resources;

- Implementation of local land use practices that enhance pipeline safety;
- Community and pipeline awareness campaigns, such as "811 Call Before You Dig"; and
- Enhancements in public participation in official proceedings pertaining to pipelines.

These funds are vital to the safety of the communities near or on top of pipeline imbedded land. However, the funding may *not* be used for lobbying, in direct support of litigation, or for activities associated with regulatory compliance or typical operations and maintenance of pipeline facilities.

What benefits will be provided to the American public through this request and why is this program necessary?

The request will allow PHMSA to carry out an effective staffing plan, support innovative modern information technology, improve internal management processes for the safety organization, and enhance responsiveness to Congressional and regulatory requirements.

PHMSA's request supports the safe movement of hazardous materials through all modes of transportation and pipelines. Through this primary safety goal, PHMSA advocates for a clean environment with enhanced safety standards, improvements, and commitment to innovation. The agency will also continue its critical COVID-19 relief efforts, which have included processing of special permits to allow emergency distribution of hand sanitizer, and review of home test kits to ensure safe and rapid shipment.

IV: Research, Development and Technology

Department of Transportation
FY 2022 Budget
Pipeline and Hazardous Materials Safety Administration
Research, Development, & Technology Budget Narrative
(Budget Authority in Thousands)

Budget Account	FY 2020 Actual	FY 2021 Enacted	FY 2022 Request	Applied	Tech Transfer	Facilities	Experimental Development	Major Equipment, R&D Equipment
Pipeline Safety	**$15,000**	**$12,000**	**$15,000**					
Safety								
Liquefied Natural Gas (LNG)/Hydrogen Safety	2,226	2,226	2,500	X				
Underground Natural Gas Storage (UGS) Safety Research	2,500	2,500	3,000	X				
Pipeline Anomaly Detection /Characterization	1,374	1,374	1,700	X	X			
Pipeline Leak Detection	750	750	500	X	X			
Pipeline Threat Prevention	1,850	1,850	1,500	X	X			
Repair/Rehabilitation	1,300	1,300	1,800	X	X			
Competitive Academic Agreement Program	2,000	2,000	2,000				X	
Climate Change	0	0	2,000	X				
Infrastructure								
Pipeline Transportation Technology Center (TTC) Research	3,000	0	0			X		
Hazardous Materials Safety	**$7,570**	**$5,070**	**$7,570**					
Safety								
Risk Management	744	493	1,500	X				
Technical Analysis	2,446	2,446	1,000	X				
Package Integrity	3,039	1,039	2,500	X				
Innovation								
Emerging Technologies	1,342	1,092	2,570	X				
Administrative Expenses	**$1,909**	**$1,909**	**$1,909**					
Pipeline Safety	1,363	1,363	1,363					
Hazardous Materials Safety	546	546	546					
Total	**$24,479**	**$18,979**	**$24,479**					

Pipeline and Hazardous Materials Safety Administration (PHMSA)

Research Summary

The Pipeline and Hazardous Materials Safety Administration's (PHMSA) mission is to protect people, property and the environment by advancing the safe transportation of energy products and the safe packaging and shipment of hazardous materials that are essential to our daily lives. A transition to new energy sources requires new research, development, and technology (RD&T) to ensure safe and effective regulation of transport of new energy products—particularly as volumes scale up. PHMSA's R&D proposed R&D budget aims to address ongoing safety and environmental risks and challenges with transporting new energy products.

America's pipeline infrastructure spans more than 2.8 million miles, and is used to transport nearly all the natural gas and about two-thirds of the liquid petroleum energy products consumed domestically. PHMSA also confronts safety challenges posed by the increased transportation of hazardous materials across all modes--more than 3.3 billion tons annually and more than 1.2 million shipments per day. The routes taken by these shipments must be chosen in an equitable and environmentally sustainable manner. Unexpected circumstances continue to arise and the agency must prepare for any emerging issues such as with COVID-19. Research provides critical solutions to these ongoing challenges.

Due to the significant contribution of energy and hazardous materials to our economy and standard of living as well as their associated environmental impacts, research projects promoting safety, resilience and performance of our transportation system are essential. PHMSA will fund research that improves safety to reduce potential human and environmental impacts. This kind of research will enhance the security of our infrastructure, our people, and our environment. In Fiscal Year (FY) 2022 PHMSA will pursue RD&T goals through projects carried out by its Office of Pipeline Safety (Office of Pipeline Safety) and the Office of Hazardous Materials Safety (Office of Hazardous Materials Safety).

<u>Collaboration Efforts</u>
PHMSA's R&D program collaborates with research organizations, academia, and other stakeholders. Office of Pipeline Safety collaboration efforts include joint research projects, in which Office of Pipeline Safety and outside partners cost-share to conduct research, and fund research service contracts with federal partners. Office of Hazardous Materials Safety collaboration is more consultative in nature; while PHMSA welcomes the input stakeholders in industry, academia, and the public, it contracts for research services rather than forming joint partnerships. Both offices have Research and Development (R&D) Forums to identify safety gaps and research opportunities.

Office of Pipeline Safety R&D collaboration efforts include both federal and non-federal partners. Historically, Office of Pipeline Safety has reached interagency agreements with the Departments of Energy, Interior, and Commerce to conduct materials research. Office of Pipeline Safety partners with academic institutions through its Cooperative Academic Agreement Program (CAAP). Under CAAP, PHMSA funds 80 percent of basic R&D costs, leaving 20 percent to be funded by university partners. (PHMSA may fund up to 100 percent of R&D costs

related to regulatory analysis or other purely governmental purposes.) These levels are specified in and mandated by Section 22 of the *Protecting our Infrastructure of Pipelines and Enhancing Safety Act of* 2020 (PIPES Act). PHMSA expects to meet all mandated requirements for non-federal financial contributions.

As mentioned, the Office of Hazardous Materials Safety's collaborative work is primarily in the form of consultants and contractors. The Office of Hazardous Materials Safety funds work conducted in academia and the private sector, with a strong emphasis on small businesses, but does not currently engage in cooperative research. Instead, Office of Hazardous Materials Safety engages in interagency agreements with other federal and non-federal government agencies including the Army Research Laboratory and the Naval Research Laboratory, among others.

External Partners

PHMSA's research program partners with a wide range of external partners who share the same objectives in developing technology or generating and promoting new knowledge among decision makers to advance pipeline and hazardous materials safety. Collaborative forums with academia, departmental, and federal partners help identify pertinent technology and knowledge gaps. The FY 2022 high-priority research projects are funded by PHMSA, and will be competitively solicited and awarded. Therefore, the awardee/research partners will be known once awards are decided.

Anticipated Outcomes

PHMSA's pipeline-related research is dedicated to stimulating innovation in pipeline safety and performance. Anticipated Office of Pipeline Safety outcomes will include prevention of excavation damage to pipelines, reductions of pipeline facility accidents/incidents, reduction of greenhouse gas emissions, improvements in safety systems for pipelines, underground gas storage, liquefied natural gas facilities, and technology commercialization.

Safety improvements result in reduced human and environmental risk and promote goals of economic recovery and equity. PHMSA anticipates that Office of Pipeline Safety research will improve safety both by contributing to agency knowledge that can be applied to safety regulations and practices.

Collaborative projects with industry can result in U.S. patents. In addition, as CAAP projects transition to additional phases, PHMSA will be promoting the professional development of qualified experts through both student internships and career employment. Specific research areas for FY 2022 will include liquefied natural gas (LNG) facility safety, underground natural gas storage safety, leak detection, damage prevention, pipeline anomaly detection, and climate change and renewable energy. PHMSA will use the Office of Pipeline Safety's R&D Forum—a public interactive workshop to be held in FY 2022—to discuss and refine its R&D projects with a broad range of stakeholders.

PHMSA's hazmat-related research furthers the goal of transportation safety by reducing the likelihood of personal injury and environmental damage resulting from hazardous materials

releases. Office of Hazardous Materials Safety projects fall under four core areas: improved risk management and mitigation, fostering emerging technologies, promoting packaging integrity, and conducting technical analysis to aid in risk assessments.

Anticipated outcomes include:

- Improved hazardous materials commodity flow data;
- Enhanced risk modeling and risk analysis;
- Improved safety standards;
- Improved performance of packages used to transport hazardous materials; and
- Improved non-destructive inspection techniques.

New High-Priority Research Areas/Projects for FY 2022

PHMSA recognizes the importance of addressing the President's Executive Orders on Climate Change (Executive Order 14008), Environmental Justice (Executive Order 13895) and the COVID-19 Crisis (Executive Order 13998) in the upcoming program plans. Accordingly, strategic objectives to analyze containment of greenhouse gases (such as methane), transportation of alternative fuels including hydrogen, and improved leak detection are focal points for the Office of Pipeline Safety (Office of Pipeline Safety) program.

PHMSA pipeline research is supported through a combination of federal funding and industry co-funding with a variety of partnering organizations. For PHMSA's pipeline research program, approximately 30 percent of funding for a given project is from non-federal entities—20 percent in the case of CAAP partnerships with universities—although PHMSA may fund up to 100 percent of the cost of R&D for purely governmental purposes. Hazardous Materials research programs are entirely federally funded. R&D appropriations have a three-year period of availability.

Pipeline Safety Research Project Focus Areas:

- Climate Change/Renewable Energy
- Liquefied Natural (LNG) Gas Safety
- Underground Natural Gas Storage (UGS) Facilities Safety
- Pipeline Anomaly Detection/Characterization
- Pipeline Leak Detection
- Pipeline Threat Prevention
- Repair/Rehabilitation
- Competitive Academic Agreement Program (CAAP)

Hazardous Materials Safety Research Project Focus Areas:

- Hazardous Materials Risk Management and Mitigation
- Hazardous Materials Package Integrity
- Hazardous Materials Emerging Technologies
- Hazardous Materials Technical Analysis to Aid Risk Assessments

Performance Measures:

PHMSA employs close relationships with research partners throughout a project to ensure that it remains on track and is achieving its intended results. Tasks are put in place to ensure contractor results align with agency and Department goals. Program outcomes are based on performance metrics that include technology demonstrations, patent applications, commercialized technologies, and technology transfer (T2) success rate (i.e., the frequency of each completed research project resulting in commercialization). New technology demonstrations are tracked because these are a good indicator of potentially new U.S. patent applications and ultimately, U.S. patents. The number of publicly available final reports, along with published conference and journal papers, website visits, and downloaded files are tracked to measure the level of stakeholder interaction and interest in the program. The number of stakeholders reached via public events is also tracked.

PHMSA's research affects the DOT's overall research goals in both the near and far-term. PHMSA sometimes conducts research that directly contributes to standards and rulemaking. The impact of the research is directly observable in the content of later actions of the agency. Projects that involve the development of new technology may take many years to mature and their impacts are often not immediately observable. In these cases, the outcomes of R&D activity in the current year, may not directly affect observable programmatic objectives.

Often technology is not commercialized at the end of the project timeline. To attempt to capture this data, PHMSA conducts an annual survey on post-completion technology development to inquire whether project technology was commercialized. The initial impact of the technology may be missed simply because of the timing of the survey. For instance, a researcher may provide technology demonstrations to commercializing vendors who then pick up the technology and offer it to the hazmat transportation or pipeline industry. If commercialization occurs after a snapshot estimate, the initial tech transfer may not be observed. It may take years for this to happen presenting difficulties in tracking the achievement of program targets. However, over the longer-term, commercialization does occur and has significant impacts on safety.

The program is developing performance measurement tracking tools and intends to incorporate them on the PHMSA program website. These tracking tools will also show the relationship of the program to the DOT Strategic Plan, PHMSA Strategic Plan; Annual Performance Plan, or any data call requested of this program.

FY 2022 Program Description
Pipeline Safety Research

FY 2022 Funding Request: $16,363,000
(includes Administrative Expenses)

Program Description/Activities

Research in this area leads to the development of new or improved tools and technology to aid in the prevention and reduction of damage to pipelines. Research also assists with the early identification of leaks (before they lead to catastrophic ruptures), and the identification of alternative fuels to reduce greenhouse gas emissions. These investments will prevent/lessen the releases of hazardous materials into the environment. The Pipeline Safety Research Program is collaborative by design. Research funding is derived from the operators through user fee assessments and from an Oil Spill Liability Trust Fund contribution. A comprehensive research strategy is developed systematically through research and development forums, research gap ideas submitted by the public, PHMSA initiatives, and collaborative partnerships with government and non-government organizations. For example, PHMSA's most recent Pipeline R&D Forum was held in Arlington, Virginia, on February 19-20, 2020, with approximately 240 attendees. PHMSA utilized the recommendations from the Forum, as well as internal pipeline data to establish its FY 2021 research funding agenda and solicitations. PHMSA plans on conducting a hydrogen/climate challenge workshop in September 2021, which will further identify gaps in the R&D areas related to alternative power generation fuels and greenhouse gas emission reductions. These activities in 2021 will outline the research agenda solicited and awarded in FY 2022.

PHMSA's research partners include universities, industry, and safety organizations that specialize in bringing safety technology to production. One important programmatic component is that it funds cooperative research with colleges and universities to spur innovation by enabling academic research focused on high-risk, high-reward solutions to a wide range of pipeline safety challenges. This program also exposes students to both the pipeline industry and common pipeline safety challenges to illustrate how their engineering and technical disciplines are highly desired and needed in the pipeline field. PHMSA will continue to expand its outreach for the Competitive Academic Agreement Program (CAAP) solicitations by ensuring all higher education institutions, including Historical Black Colleges and Universities, Women's Colleges, and Tribal Colleges are notified of research opportunities, and have an equitable chance to compete. Furthermore, PHMSA will continue to fund projects that will enhance pipeline safety in all communities, especially economically disadvantaged and underserved ones. PHMSA's funding opportunities to a wide array of small businesses, academic institutions, and research entities will promote economic growth affecting those communities.

Following is a summary of Pipeline Safety research in its focus areas:

1. Liquefied Natural Gas (LNG)/Hydrogen Safety ($2.5 million) -The recent growth in the production and export of LNG has required PHMSA to provide clear regulatory guidance

within the changing energy landscape. LNG research activities will address various safety challenges related to hazards, as well as foster development of new technologies and alternative designs for LNG storage and piping systems. Because cryogenic hydrogen is similar to LNG, research on LNG has overlapping value for future hydrogen uses.

2. Underground Natural Gas Storage (UGS) Facilities Safety ($3.0 million) – In October of 2015, there was a huge gas leak located in Aliso Canyon's Gas Storage Field in California. The leak was not plugged until February of 2016. From November 2015 to February 2016, data reported atmospheric leak rates of up to 60 metric tons of methane and 4.5 metric tons of ethane per hour. Ultimately, this leak was responsible for releasing a total of 97,100 metric tons of methane into the atmosphere[1]. During its peak, that is double the emission rate of the entire region of Los Angeles, CA. It was this environmentally disastrous event that prompted Congress to provide PHMSA with significant new statutory authorities to regulate underground natural gas storage. In 2018, PHMSA began funding research and building a portfolio of solutions to support the development of integrity management programs applicable to the more than 17,000 wells associated with underground natural gas storage facilities in the United States. Additional underground natural storage research gaps will be pursued in FY 2022 to investigate surface wellhead seal design and monitoring, use of fiber optics to monitor wellbores and methods to improve cathodic protection of storage wells to improve the integrity of UGS facilities, and thereby reduce natural gas releases into the environment.

3. Pipeline Anomaly Detection/Characterization ($1.7 million) - The detection and characterization of anomalies in pipeline systems require solutions that integrate people, processes, and technology into a comprehensive program. Detection capability must progress past simple corrosion to complex anomalies involving a mixture of dents, gouges, and corrosion. Research activities will develop new or improved tools, technology, and assessment processes to identify and locate critical pipeline defects and to improve characterization of their severity. Corrosion continues to be a major contributor of reportable incidents, accounting for 24% of serious incidents[2]--as well as associated greenhouse gas emissions. This will drive further investigation of detection and characterization solutions and develop technology and models that can improve the management of integrity threats.

4. Pipeline Leak Detection ($500 thousand) - Leak detection continues to present a challenge. In 2018, leaks of natural gas from distribution pipelines accounted for 215 kilotons of methane emissions; approximately 46% of methane emissions from the gas distribution system[3]. Research under this element strongly supports efforts to abate methane releases and other climate change initiatives. Interagency and stakeholder engagement in 2021 will drive the specific research strategy funded in FY 2022.

5. Pipeline Threat Prevention ($1.5 million) - Damage to pipe by excavation and outside force continues to be a leading cause of pipeline failures based on 2021 pipeline incident data.[2] Preventing or reducing damage would dramatically improve pipeline safety and reduce

[1] https://science.sciencemag.org/content/351/6279/1317
[2] https://www.phmsa.dot.gov/data-and-statistics/pipeline/national-pipeline-performance-measures
[3] From 2018 EPA data.

methane emission. PHMSA's research will develop new or improved tools and technology to aid in the prevention and reduction of damage to pipelines, thereby enhancing safety and preventing or diminishing releases into the environment.

6. Repair/Rehabilitation ($1.8 million) - Damaged coatings and corrosion are major problems for pipelines; reliable methods for repairing these issues and bringing pipeline systems back online are of paramount importance. This program will result in enhanced repair materials, techniques, processes, tools, and/or technology designed to directly support this objective.

7. Competitive Academic Agreement Program (CAAP) ($2.0 million)- Launched in 2013, this program provides funding for academic research and tomorrow's pipeline safety workforce with an opportunity to contribute safety solutions. The CAAP tackles pipeline safety challenges by producing high-risk and high-reward solutions. The CAAP program applications typically open in the Spring to undergraduate, graduate, and doctoral research students. The cooperative agreements are competitively selected, and the number of awards depends on the quality of submissions and budget limitations. PHMSA prioritizes projects based in part on their potential to deliver preliminary pipeline safety findings (e.g., validating a thesis or theory's proof of concept) that can be further investigated through PHMSA's core research program or later CAAP project. Students become aware of just how highly desired their engineering and technical disciplines are in the pipeline field.

Competitive Academic Agreement Program Students

8. Alternative Fuels Research to Address Climate Change – The 2019 U.S. Environmental Protection Agency (EPA) Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks data reports that natural gas transmission and distribution pipelines made up for 24% and 9% of total methane emissions, respectively. Compressor station leaks made up approximately 48% of the methane emissions from gas transmission sources; and industrial meters and residential meters made up 63% of methane emissions from distribution sources[4]. In order to address climate change, PHMSA will work towards methane emission reductions from its regulated infrastructure, including compressor stations, by coordinating with its stakeholders and interagency partners to develop strategies to fund research projects in this topic area.

   PHMSA plans to identify research gaps for hydrogen gas and/or for various hydrogen blends in natural gas pipeline facilities, including gas transmission, gas distribution, compressor stations, and gas storage that reflect current projections for industry utilization of pipeline systems and storage. PHMSA plans to conduct a study/literature search, and identify areas that are well supported by existing research. The study/literature search will also include areas where additional R&D investments will contribute towards improving pipeline safety and provide scientific and engineering support for potential additional regulatory rulemaking

[4] 2018 EPA data.

efforts in this area. PHMSA plans to include a recommended prioritization of R&D topic areas based on current industry usage projections.

PHMSA will be hosting a public meeting in May of 2021 focusing on methane Leak Detection and leak repair, and several technology vendors have been invited to present on their cutting-edge technologies. PHMSA will also be hosting a Hydrogen/Climate Challenge public workshop in the Fall of 2021; this workshop will provide an interactive venue for governmental and non-governmental organizations to collaborate about ongoing work and research results on renewable fuels, such as hydrogen and their safe transportation by pipeline. PHMSA will utilize the results from the gap analyses and workshop to establish its specific research strategy to address climate change for FY 2022.

Congressional Mandates:

PHMSA has been congressionally mandated to conduct several analyses and corresponding reports by the Protecting Our Infrastructure of Pipelines and Enhancing Safety (PIPES) Act of 2020 and the Consolidated Appropriations Act, 2021. The specific requirements are outlined below.

Section 105 of the Pipes Act of 2020 requires PHMSA to conduct a pipeline safety testing enhancement study analyzing the potential value to safety of an independent testing facility for pipeline safety research and development. This study will determine whether an independent pipeline safety testing facility would be critical to the work of PHMSA.

Section 114(d) of the Pipes Act of 2020 mandates that PHMSA develop a report on best available technologies or practices to prevent or minimize the release of natural gas. The report will address potential new pipeline facility designs that could mitigate the need to intentionally vent natural gas. Furthermore, the report will include a timeline for updating pipeline safety regulations to minimize the release of natural gas. The report will assist PHMSA with developing potential R&D gaps in preventing or minimizing, without compromising, pipeline safety; and the release of natural gas when making planned repairs, replacements, or maintenance, or when the operator intentionally vents or releases natural gas. This would ultimately assist in tackling climate change by reducing methane emissions.

The 2021 PHMSA appropriation requires PHMSA to submit an updated research plan to the House and Senate Committees on Appropriation and receive an approval prior to utilizing any FY 2021 funding at the Transportation Technology Center (TTC). The updated research plan will include a robust assessment of the causes of pipeline failure and pipeline safety risks. PHMSA will define its short-term and long-term research and development objectives that address pipeline safety risks identified in the assessment of incident and accident data. The plan will also describe the roles and responsibilities of PHMSA and its stakeholders in advancing technological solutions that will improve pipeline safety.

The joint explanatory statement submitted to PHMSA by the Senate and House of Representatives mandate a review of current and new corrosion control techniques that may be utilized to reduce leaks from regulated aboveground storage tanks. The review will include an

analysis of supplementary or alternative techniques of cathodic protection systems for aboveground storage tanks.

Expected Outputs/Products:

PHMSA's pipeline-related research activities result in the development of new technology, products, and knowledge aimed at improving pipeline safety and performance. PHMSA anticipates that research in this sector will result in the commercialization and transfer of cutting-edge pipeline safety technologies, the issuance of new U.S. patents, and the solutions to complex research questions that inform safety standards. PHMSA frames research questions around safety standards, and measures the success of research on how well it answers the question, informs safety standards, and improves overall safety outcomes.

The following are some examples of prior FY outputs and products:

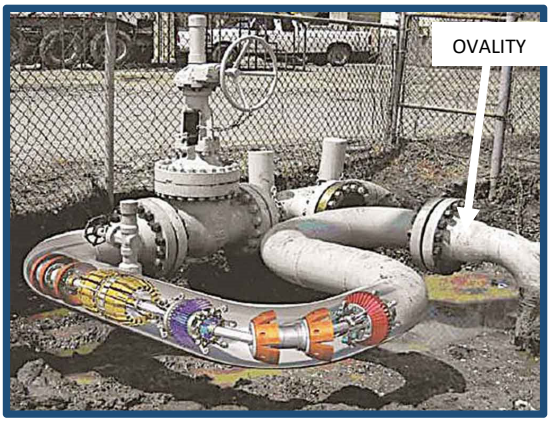
Pipeline Threat Prevention – In FY 2019, PHMSA registered technology transfer for the project entitled "GPS-Based Excavation Encroachment Notification". The project demonstrations validated that data collection during active construction activities could be used to reduce or eliminate damage from excavation activities. The commercialized solution was licensed to Hydromax USA under the product name UtilAlert. This data collection provides benefits that minimize the cost of damages, avoids delays to completion schedules, enhances safety for workers and the general public; and allows all stakeholders to benefit from enhancing situational awareness and reducing risk.

Pipeline Leak Detection – In FY 2019, PHMSA registered technology transfer for the project entitled "Natural Gas Pipeline Leak Rate Measurement System". The project supported development of the Heath MobileGuard™ gas leak detection system, which consists of a methane/ethane analyzer, GPS, sonic anemometer, and proprietary leak detection software that presents real-time geospatial maps of multiple gas concentrations. The software's sophisticated leak detection algorithm combines the system's measurements of gas concentrations (CH4, C2H6), local coordinates (GPS), and local wind velocity (sonic anemometer) to estimate the leak location. Readings are stored in the device and can be transmitted in real-time to a cloud environment for centralized monitoring. The MobileGuard laser-based sensor sensitivity and precision is more than 3,000 times greater than legacy methods, enabling identification of leaks several hundred feet away from the source. The systems improvement in identifying leaks and their location will enable entities to more expeditiously repair the leak source; limiting the duration of methane emissions. Limiting the duration of unintentional methane releases will help advance the Administration's executive action to tackle climate change by ultimately lowering the U.S.' s cumulative methane emissions.

Pipeline Anomaly Detection/Characterization – In FY 2020, PHMSA registered technology transfer for the project entitled "In-Ditch Validation Methodology for Determination of Defect Sizing". The research development and validation success supported incorporating Inverse Wave Field Extrapolation (IWEX) technology onto calibration tools, seam weld inspections, and magnetic crawlers for Stress Corrosion Cracking inspections at Applus. IWEX is a next-generation ultrasonic inspection technique with the ability display flaws as a two-dimensional

cross-section or as a three-dimensional image, allowing users to get a better look at flaws to determine if they are true defects or benign.

Pipeline Anomaly Detection/Characterization – To date in FY 2021, PHMSA registered technology transfer for the project entitled "Development, Field Testing and Commercialization of a Crack and Mechanical Damage Sensor for Unpiggable Natural Gas Transmission Pipelines". To see inside a pipeline, industry uses a device known as a "smart pig"[5]. This canister-looking piece of equipment can detect all kinds of conditions including low pressure, dents, liquid vs. gas pipelines, wrinkles in the pipe's metal, pipe coating and even thickness. Through the pig's sensors and GPS capabilities, these devices remain as one of the most effective diagnostic tools for industry. Without having to shut down a pipeline, a pig can propel itself with the help of sealing disks throughout the pipes without going too fast (up to 3 to 5 m/second). When a pig is inside of a pipeline collecting data, it is usually referred to as "pigging". The research supported the launch of the Laser Deformation Sensor (LDS) on the Explorer line of robotic inspection tools. The LDS is a laser-based sensor that allows the identification of any mechanical damage or ovality (when a pipe is bent to create a change in direction) issues in a hard to inspect or unpiggable natural gas transmission pipeline. Unlike its traditional caliper-based mechanical damage sensors found on smart pigs, this sensor has no moving parts, requires minimal power to operate; is very light and occupies very little space. These are all important attributes for effectively operating in traditionally unpiggable systems. It identifies mechanical damage or ovality issues at an accuracy level comparable to or better than traditional calipers.



Smart Pig in use inside of a Pipeline

[5] https://s3.amazonaws.com/ogden_images/www.minotdailynews.com/images/2018/04/11183046/Gallery-3-pig-in-bendy-pipe-521x392.jpg

FY 2022 Program Description
Hazardous Materials Safety Research

FY 2022 Funding Request: $8,116,000
(includes Administrative Expenses)

Program Description/Activities

PHMSA conducts hazardous materials safety research to reduce the risks associated with the transportation of hazardous materials and to identify and evaluate new technologies to facilitate the safe, secure, and efficient transportation of hazardous material.

These goals are supported through four core areas of research: Risk Management and Mitigation, Package Integrity, Emerging Technologies, and Technical Analysis to Aid Risk Assessments. Each core area is described in detail below.

1. Risk management and mitigation ($1.5 million) research considers the probability of hazardous materials transport incidents and associated consequences. Specific projects in this strategic area include the development of risk management methods and tools to improve the understanding of key risks by the hazardous materials packaging and transport industry. The Office of Hazardous Materials Safety is currently working with the U.S. Census Bureau to develop a hazardous materials commodity flow survey which will define the quantity and number of shipments of hazardous materials transported annually. The data, which will be subdivided by hazard class, will improve our transportation risk modeling and analysis capability which in turn will lower the risk of transport.

2. Package integrity ($2.5 million) research studies help form standards that ensure hazardous materials remain contained within original packaging during the entire transportation cycle, protecting surrounding environments. Package integrity research evaluates and verifies the suitability and effectiveness of packaging standards and practices. Specific research areas include testing and evaluation of existing packaging materials and packaging technologies; analysis, and performance evaluation of emerging packaging materials and methods; and evaluation of component materials of combination packaging. On the emerging materials front, one of the Office of Hazardous Materials Safety' academic partners is currently developing the use of novel materials, primarily aerogels, as a safety enhancement to packaging systems. Aerogels have been shown to be very effective as insulation and non-toxic to humans and their surroundings.

3. Emerging technologies ($2.6 million) research identifies and analyzes emerging materials, packaging technologies, and transport operations. Research in this sector often looks at enhancing the safety of energy commodities, including various grades of crude oil, liquefied natural gas, and charged energy storage devices (i.e. batteries); analysis of new packaging materials and technologies; analysis of transportation systems and operations; and international collaborative research to support the export of U.S. energy products. Novel rail car shell materials like composite metal foams, novel aerogels (as mentioned above) and our most recent and forward-looking work in sodium ion batteries (NaBs). NaBs are able to be

transported at a zero percent state of charge, unlike lithium ion batteries, rendering them essentially inert in transport. While this work is in its earliest stages, PHMSA has positioned itself at a foundational level in this work.

4. Technical Analysis to Aid Risk Assessments ($1.0 million) research evaluates activities, events, and incidents. Planned research activities include the analysis of individual incidents and accidents involving hazardous materials to determine root cause; determine patterns or anomalies within packaging or systems; and the development of new inspection and test methods to classify materials and certify packaging. The Office of Hazardous Materials Safety is currently working with the National Academy of Sciences to identify and address transportation risks associated with the rail transport of liquefied natural gas as well as researching the costs associated with rail delays due to accidents involving hazardous materials.*

Expected Outputs/Products: PHMSA's Hazardous Materials research informs improvements in packaging and transport of dangerous goods. Research outcomes will help to decrease transportation accidents and incidents, and hazardous materials-related consequences by improving packaging integrity and providing the transport community with affordable and sustainable technology solutions that improve transport safety.

PHMSA has produced and will continue to support work in the safety standards in transport of rail and tank cars, autonomous vehicle applications, and the protection of passengers and environments potentially affected by the transport of charged storage devices by air. Areas such as these results in safety guidance like the *Emergency Response Guidebook* for hazardous materials remediation and cleanup. This publication requires research to inform cleanup and remediation of highly combustible and toxic materials often released during unexpected incidents.

By remaining at the forefront of transport safety methodologies and technologies, PHMSA is well positioned to keep up with the growing markets of hazardous materials and their applications. There is a projected increase of over 40% in non-electric vehicle use of charged storage devices over the next several years. Given this increase, there is a need to continue to fund work in the areas that meet the challenges presented by this uptick. Not only for the safety of the commerce that is in transport, but for the safety of the people and the environments the transported materials effect on a daily basis.

*Details of specific projects reflecting the research areas mentioned can be found in the attached index.

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Office of Hazardous Materials Safety Directed Research Areas

1. ***Risk management and mitigation***
2. ***Package integrity***
3. ***Emerging technologies***
4. ***Technical Analysis to Aid Risk Assessments***

Specific Work Addressing Focus Areas

Amongst the 20 active projects in the Office of Hazardous Materials Safety R&D portfolio, the 6 projects below provide a detailed view of how PHMSA funds work to address our research areas. Many of these projects, and ones not listed here, overlap the core research areas, casting a wider net in order to minimize information gaps.

a. **Honeycomb-encapsulated phase change materials composites for battery transportation safety:** This research measures the effectiveness of using composite materials called aerogel-PCMs to prevent the self-immolation, or thermal runaway, of lithium-ion batteries. The increased usage of Lithium-ion batteries (LIB) is being accompanied by an increased number of transportation incidents. For battery transportation, containing thermal runaway is most critical, but also very challenging, as a typical LIB failure can generate sparks and flames which can ignite conventional packaging materials. Recent work from NASA has shown that up to 75 Kilojoules of energy can be released from a single fully charged 18650 cylindrical cell during failure, which is more than 10 times the energy required to initiate thermal runaway through heating. In addition, the surface of LIB cells during thermal runaway can approach 1000 ºC, which is more than sufficient to ignite packaging materials on contact. No divider material (cardboard of multiple thickness, aluminum, aramid, acrylic, and cardboard treated with a fire-retardant spray) has been shown to prevent thermal runaway at state of charge (SOC) >50%. The Naval Surface Warfare Center, Carderock Division, has shown that thermal runaway can be mitigated, or altogether suppressed, by inserting phase-change materials (PCM) between cells. No existing commercial solutions appears to address the issue of thermal cell propagation. Cell propagation must be addressed, since the FAA study showed that large amounts of vapors and fumes can be liberated by a thermal runaway of more than one cell. The released gases are flammable and can ignite neighboring packaging material. PHMSA is currently collaborating with Virginia Commonwealth University to manufacture and test composites that can prevent thermal runaway. The composites are based on inorganic aerogels, which are excellent, porous thermal insulators. The pores of the aerogels will be partially filled with an inorganic PCM. The aerogel-PCM composite will prevent runaway in two ways. The thermal

insulation of the aerogel will contain the heat generated by a failing cell, and the PCM will provide for cooling. **(addresses topics 2 and 3)**

b. **High Strain Rate Rupture and Fragmentation of Aluminum Cylinders:** PHMSA is conducting failure analyses on a ruptured aluminum cylinder to determine whether AL6061-T6, an aluminum alloy commonly used to manufacture hydrogen transportation equipment, is unduly brittle for this application. This research is being conducted by PHMSA through its contractor WHA. The investigation revealed unusual features along the fracture planes of the cylinder wall and resulted in an unusually high number of fragments. The cylinder contained a reactive synthesis gas that was comprised of about 50% hydrogen and other gases including acetylene (16%) at elevated pressure (~1900-2000 psi). The internal reaction developed when an acetylene decomposition was triggered leading to a sudden pressure rise in the cylinder and catastrophic rupture. Despite the mechanism for ignition, also studied by PHMSA and WHA, some features of the fracture patterns could not be explained during the failure analysis which led to concerns about hydrogen effects on the cylinder material. This research will evaluate whether an unknown failure mode exists (ductile to brittle transition during rupture) with AL6061-T6 cylinders containing hydrogen. AL6061-T6 is one of the alloys of choice for hydrogen storage in the rapidly growing hydrogen economy and represents a predominant industry alloy. Based on available research, AL6061-T6 has not exhibited a known embrittlement problem; however, in addition to the synthesis gas cylinder rupture incident described above, WHA has also observed other cylinder ruptures with a high number of fragments on Type 3 COPVs that have AL6061-T6 aluminum liners. Hydrogen piping systems and storage vessels, where this alloy is used, could also be at risk based on the concern that a potentially unknown failure mode exists which increases the severity of ruptures due to brittle transition producing increased fragmentation. The medium and long-term effects of the project could lead to a better understanding of the causes for potential brittle transition in this alloy and manufacturing processes or containment strategies that may help mitigate the effects. Industry and manufacturing consultation pertaining to the ultimate outcomes is considered important for the project. Further, if the failure mode is confirmed and the manufacturing process influences are determined (grain size influences, etc.) then manufacturing constraints on 3AL 2015 AL6061-T6 cylinders could be considered by manufacturers and DOT/PHMSA. **(addresses topics 1 and 2)**

c. **Thermo-Mechanical Responses of FRP Composite Jacketing for Tank Cars under Impact and Fire**- This project is to develop a composite jacketing for DOT-117R tank cars to allow the tank cars to meet the retrofit requirements. In May 2015, PHMSA released a final rule for safer transportation of high-hazard flammable liquids by rail to enhance the design specifications of both the new and existing tank cars. According to the final ruling, existing tank cars (i.e., DOT-111 and CPC-1232) must be retrofitted in accordance with the retrofit requirements outlined in DOT-117R. These tank car standards were enacted to reduce the probability and consequences of accidents of tank

cars carrying large volumes of hazardous, flammable liquids. However, thicker shells and other protection systems can add weight to a tank, resulting in reduced shipping capacity and increased shipping costs. The proposed multifunctional composite jacket is dry and flexible to wrap around a tank car before infusing with resin and curing, to meet the tank car safety requirements of DOT Specification 117. The proposed multifunctional jacket will possess superior performance over conventional materials, with high strength and stiffness, better puncture resistance, and excellent energy absorption under impact, in addition to providing longer survival time under fire. **(addresses topics 2 and 3)**

d. **Commodity Flow Study-** This project will provide PHMSA with yearly hazmat volumes by commodity and detailed packaging information, bridging existing agency data gaps on this subject. PHMSA is collaborating with the US Census Bureau on this work. PHMSA currently obtains information on packaging data from industry, investigators, engineers and incidents, but no formal and quantifiable collection system exists for the types of packaging in transport. The volume of hazmat transported is currently being collected in the Commodity Flow Survey, but data is only available every five years per the census. Data gaps exist when a rulemaking or a risk assessment requires and accurate snapshot of packaging type or when exposure is gauged using hazmat volumes from the previous five-year stint. The objective is to validate and provide context to the hazardous material packaging, transport and incident data that is collected by the agency. **(addresses topics 1 and 4)**

e. **Composite Metal Foams for Impact Protection of Hazardous Material Transportation-** This research manufactures and tests the puncture and thermal resistance of tank car panels made from a novel, low-weight material called stainless steel (S-S) composite metal foam (CMF). Punctures to rail tank cars can release hazardous materials into the surrounding area, resulting in human fatalities and substantial environmental damage. PHMSA is conducting this research in collaboration with North Carolina State University. Since 2015, PHMSA has mandated many tank car enhancements to mitigate the consequences of rail accidents should they occur. These enhancements cause tank cars to become heavier and bulkier, resulting in lower fuel efficiency. Panels made from this novel, low weight material could potentially increase fuel efficiency while maintaining the enhanced level of safety. **(addresses topics 2 and 3)**

f. **NAS TRB Study on LNG by Rail-** PHMSA, pursuant to H. Rept. 116–106, has entered into an agreement with the National Academies of Science (NAS) Transportation Research Board (TRB) to study transportation of LNG in rail tank cars. The NAS, under the auspices of TRB, will convene a committee of 10 to 14 members with expertise in relevant technical fields and operational areas to study the transportation of liquefied gas by rail. This study examines the experience transporting LNG by other modes, including by water and truck, to identify basic principles applied for safety assurance that can inform measures taken by government and industry to ensure the safe movement of LNG by rail; what is known about the effectiveness of special regulatory and industry measures intended to assure the safe transportation of other relevant bulk rail shipments of hazardous materials, especially any routing, speed, and other operational controls

applied to high-hazard flammable trains (HHFTs) and accompanying enhanced track inspection regimes; and, the applicability to bulk rail transportation of LNG of current emergency response plans, protocols, and guides for responding to LNG transportation incidents, such as PHMSA's Emergency Response Guidebook (see Guide No. 115 for flammable gases including refrigerated liquids).

In the conduct of its review of these topics, the committee may determine that there are other topics directly relevant to the safe transportation of LNG by rail that warrant examination, and it may elect to do so. Based on findings from the study, the committee will offer recommendations as appropriate to Congress, PHMSA, FRA, industry, emergency responders, and other relevant parties on actions warranted to improve understanding of the risks associated with transporting LNG by rail, to mitigate risks, and to prevent and prepare for potential incidents. **(addresses topics 1 and 4)**

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V: Information Technology Expenditure

FY 2022 Budget
Pipeline and Hazardous Materials Safety Administration
Information Technology Budget Narrative

(Budget Authority in Thousands)

Budget Account	FY 2020 Actual	FY 2021 Enacted	FY 2022 Request
Pipeline Safety	**$11,316**	**$10,823**	**$11,189**
Commodity SS and WCF IT	5,164	4,092	5,458
Modal IT	6,152	6,731	5,731
Hazardous Materials Safety	**$7,979**	**$6,608**	**$6,533**
Commodity SS and WCF IT	3,393	2,629	3,539
Modal IT	4,586	3,979	2,994
Operational Expenses	**$7,654**	**$5,878**	**$5,124**
Commodity SS and WCF IT	1,153	917	1,163
Modal IT	6,501	4,961	3,961
Total	**$26,949**	**$23,309**	**$22,846**

The Pipeline and Hazardous Materials Safety Administration (PHMSA) is requesting **$22.85 million** in FY 2022 for information technologies (IT) that support PHMSA safety programs as well as the Department's initiative to transform and consolidate the management of certain IT solutions centrally by the Office of the Chief Information Officer (OCIO).

The Department will provide Commodity IT Shared Services for PHMSA in FY 2022 to achieve economies of scale and increase consistency of cybersecurity protections across the Department. Commodity IT Shared Services include functions and activities dedicated to basic support services, including network operations, end-user computing, telecommunications services, and server operations.

OCIO will continue to transfer modal Programmatic IT investments in FY 2022. Programmatic IT Shared Services build on the Commodity IT Shared Services to deliver either mission support or modal mission-specific IT capabilities. They include Business Support, IT Management, and General Support Systems. This category also includes mission systems for Registration, Inspections, Compliance and Enforcement and public-facing Outreach systems.

PHMSA Information Systems and Investments

- **Investment in Department Shared Services** – PHMSA requests $10.2 million for the purchase of IT services for Department-run systems through the working capital fund.

- **Information technology support** – PHMSA requests $3.9 million for expertise and safety mission support to PHMSA regional offices, operations and maintenance for other safety systems and application technical assistance for the investments above.

- **PHMSA Datamart** – PHMSA requests $2.5 million to collect and report pipeline and some hazardous material incident data, associate causality, and attach data elements that allow for use in inspection planning and safety standards design.

- **Cybersecurity** – PHMSA requests $1.1 million for security activities to safeguard PHMSA's mission systems and data, as well as to support compliance with Cybersecurity Standards (FISMA and NIST).

PHMSA Pipeline Safety

- **National Pipeline Mapping System** – PHMSA requests **$1.8 million** for operation and maintenance of this mission-critical pipeline location and mapping system. This system is used to display the location of the nation's pipelines overlaid with highly populated areas, environmentally sensitive areas, and drinking water sources. It provides aerial photography, topographic data and road overlays to inform safety inspections and new pipeline construction inspections.

- **Pipeline Risk Management Information System (PRIMIS)** – PHMSA requests **$2.0 million** for a system that disseminates safety and regulatory information to the public, State partners and industry. In addition, PRIMIS provides simple applications utilized by PHMSA's State partners to collect information on specific types of inspections.

- **Safety Monitoring and Reporting Tool (SMART)** – PHMSA requests **$3.9 million** for its primary mission system that services and supports the Office of Pipeline Safety (PHP) lines of business for incident and annual reporting, inspection and enforcement, and Safety Related Conditions.

PHMSA Hazardous Materials Safety

- **Hazardous Materials Intelligence Portal** – PHMSA requests **$2.1 million** for the data system that collects information on packagers and shippers, generating a risk rating for each regulated entity, and retains the inspection history for each entity we regulate.