



NATIONAL TRANSPORTATION SAFETY BOARD  
**Investigative Hearing**

Norfolk Southern Railway general merchandise freight train 32N  
derailment with subsequent hazardous material release and fires,  
in East Palestine, Ohio, on February 3, 2023

<b>GROUP</b>	<b>F</b>
<b>EXHIBIT</b>	
28	

Agency / Organization

**Association of American Railroads**

Title

**North American Flammable Liquid Tank Car  
Fleet: Status Report, 4<sup>th</sup> Quarter 2022**



# **North American Flammable Liquid Tank Car Fleet: Status Report 4th Quarter 2022**

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**21 April 2023**



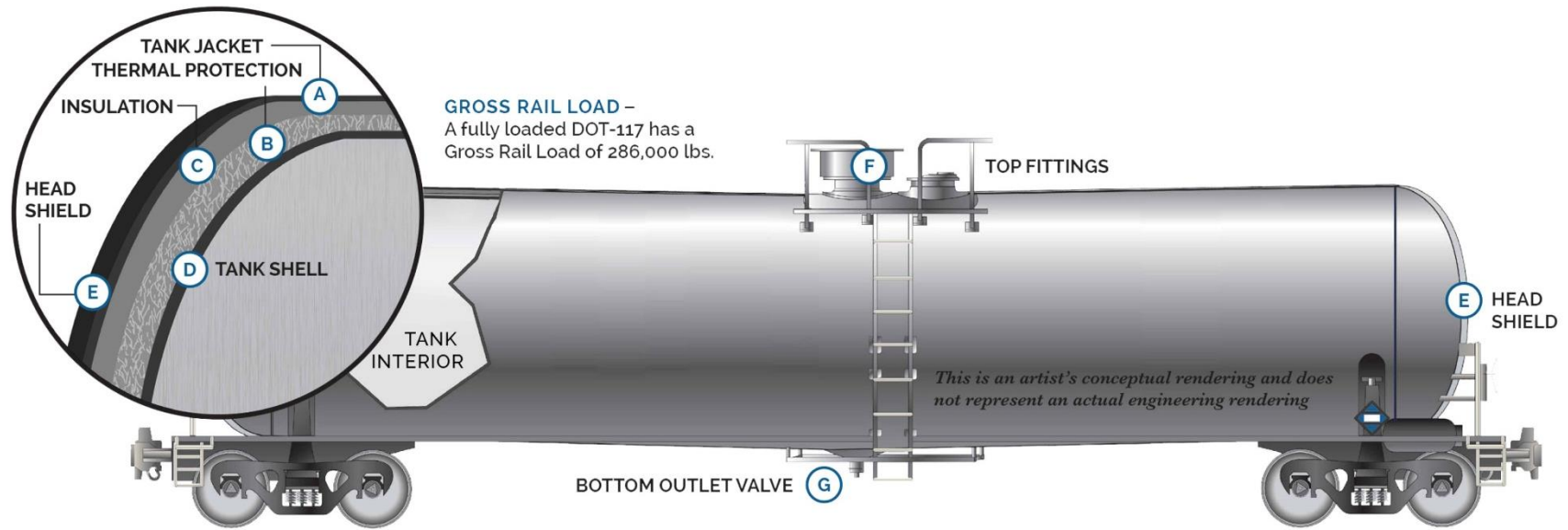
**ASSOCIATION OF  
AMERICAN RAILROADS**

# Industry and FAST Act Background on Improved Safety Designs for For Flammable Liquid Tank Cars

- In response to several large flammable liquid tank car release accidents in the late 2000s the industry adopted a more damage-resistant tank car design, the CPC-1232, to replace DOT-111 tank cars in this service
- Following several more such accidents in the early 'teens, a more robust design was proposed, and new DOT regulations were promulgated in 2015
- These regulations required that DOT-111s and CPC-1232 tank cars be phased out in favor of new specifications for more robust DOT-117 tank cars
- A risk-based schedule for phase out as reflected in the FAST Act was developed (see accompanying table)
- This report provides an update on the status of this process

Commodity Category	Phase-Out Date
<b>Crude Oil</b>	
Non-Jacketed DOT-111	1/1/2018
Jacketed DOT-111	3/1/2018
Non-Jacketed CPC-1232	4/1/2020
Jacketed CPC-1232	5/1/2025
<b>Ethanol</b>	
Jacketed & Non-Jacketed DOT-111	5/1/2023
Non-Jacketed CPC-1232	7/1/2023
Jacketed CPC-1232	5/1/2025
<b>Other Flammable Liquids</b>	
Packing Group I	5/1/2025
Packing Group II & III	5/1/2029

# Enhanced Safety Features of DOT-117J, DOT-117R, and DOT-117P Tank Cars

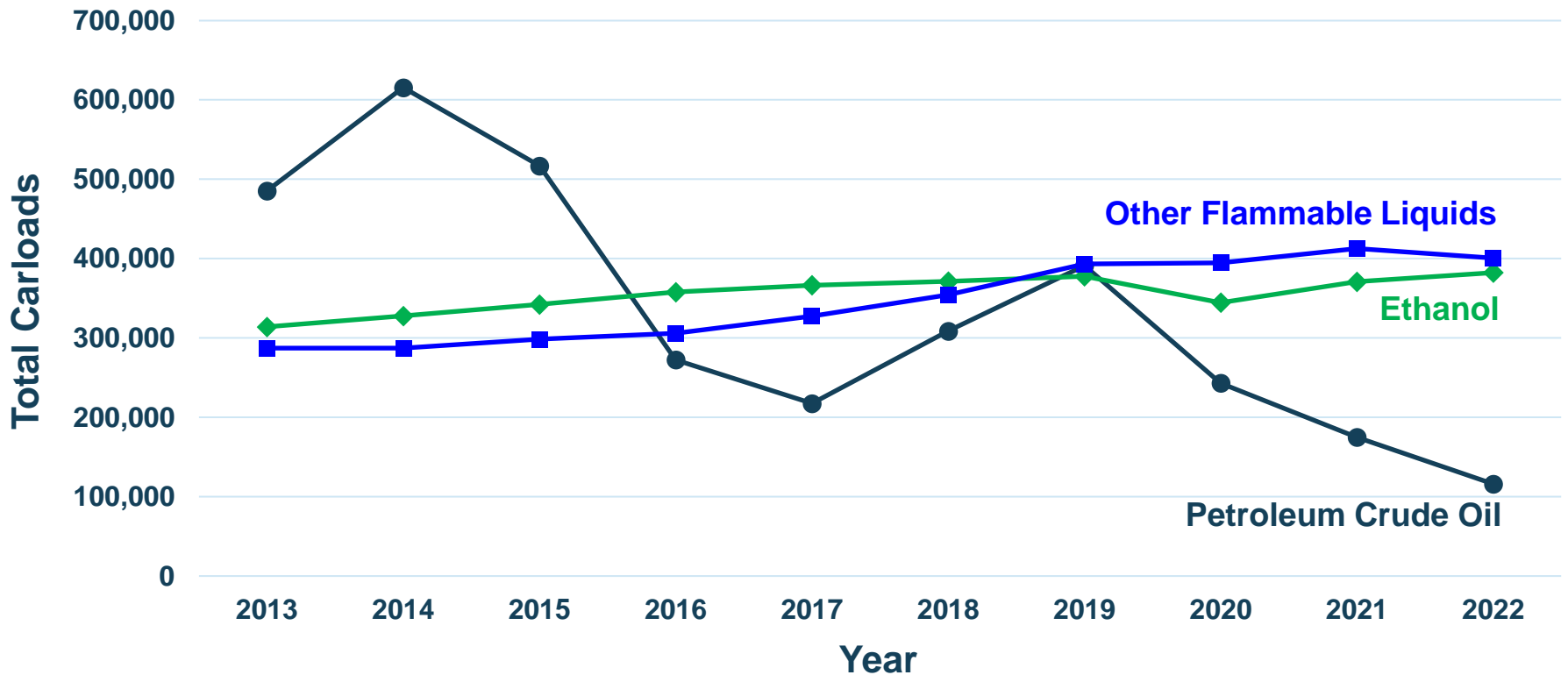


Drawing courtesy of Railway Supply Institute

- DOT-117J and DOT-120J tank cars are built new with these enhanced safety features
- DOT-117R and DOT-117P cars have enhanced safety features added to previously constructed tank cars
- For more information on tank car safety design, visit the Railway Supply Institute's Tank Car Resource Center at: <https://tankcarresourcecenter.com/>

# U.S. and Canadian Flammable Liquid Shipments

2022	Petroleum Crude Oil	Ethanol	Other Flammable Liquids	TOTAL
U.S.	79,650	379,599	228,142	687,391
Canada	36,212	2,779	138,924	177,915
<b>TOTAL</b>	<b>115,862</b>	<b>379,599</b>	<b>400,646</b>	<b>898,887</b>



# Data Sources and Other Pertinent Information

- The data used to prepare this report come from two AAR databases
  - Rail shipment data from Railinc TRAIN II waybill data
  - Tank car specification data from Railinc Umler data
- Figures presented represent the number of individual tank cars used to transport a product
  - In some cases, the same car was used to transport different product groups
  - Consequently, the sum of a row or column will not necessarily be strictly additive
- Data presented in this report reflect the tank cars in use in 2022
  - The situation at the time of publication of this report will differ as more new and retrofitted tank cars enter service

# Summary of Improvements in Tank Cars Used to Transport Flammable Liquids as of 31 December 2022

- A total of 93,125 DOT-117J, DOT-117R, DOT-117P or DOT-120 tank cars have been produced since 2013
  - 49,891 DOT-117J and DOT-120 tank cars
  - 43,234 DOT-117R and DOT-117P tank cars
- Transportation of Petroleum Crude Oil in CPC-1232 tank cars has been reduced more than 95% since 2013 and transport in DOT-111 tank cars has been eliminated
- Ethanol transportation in DOT-111 tank cars has been reduced more than 84% since 2013
- Transportation of Other Flammable Liquids in DOT-111 tank cars has been reduced more than 41% since 2013

# DOT-111, CPC-1232, DOT-115, and AAR-211 Tank Cars Used to Transport Flammable Liquids in 2022

Tank Car Type	Petroleum Crude Oil	Ethanol	Other Flammable Liquids
<b>DOT-111</b>			
DOT-111 Non-Jacketed	Prohibited	4,183	12,131
DOT-111 Jacketed	Prohibited	70	3,933
<b>CPC-1232</b>			
CPC-1232 Non-Jacketed	Prohibited	1,159	7,130
CPC-1232 Jacketed	751	24	4,233
<b>Others</b>			
DOT-115	0	5	1
AAR-211	Prohibited	Prohibited	380

- (1) Shipment and tank car specification data derived from AAR Railinc TRAIN II waybill and Umler data, respectively
- (2) Data shown here reflect traffic and tank cars used in 2022, which may differ from the situation when this report is issued



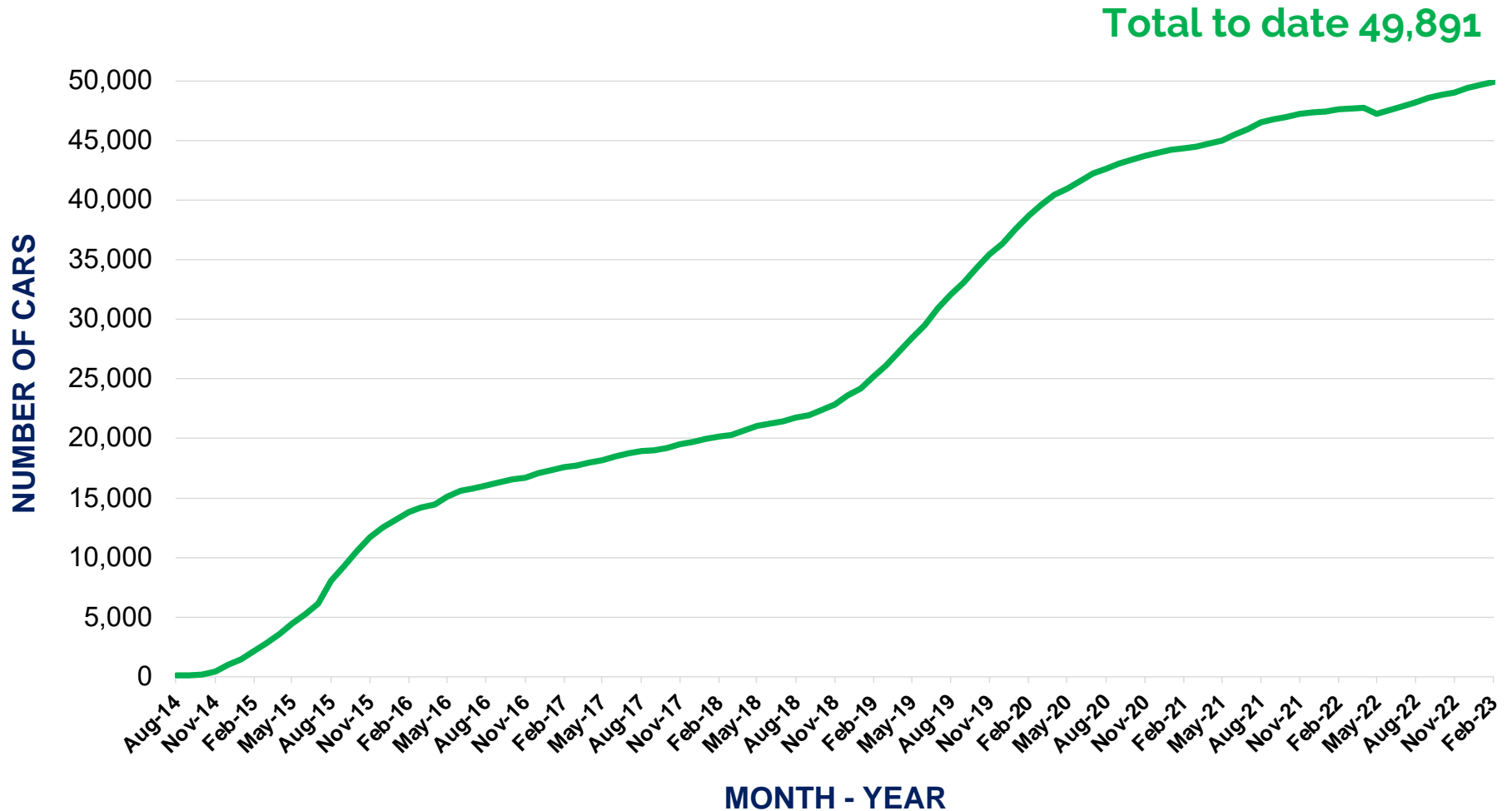
# DOT-117, DOT-105, DOT-112, DOT-114, & DOT-120 Tank Cars Used to Transport Flammable Liquids in 2022

Tank Car Type	Petroleum Crude Oil	Ethanol	Other Flammable Liquids
<b>DOT-117</b>			
DOT-117J	8,517	17,115	11,260
DOT-117R	2,236	16,961	11,571
DOT-117P	1	0	2
<b>Pressure Cars</b>			
DOT-105	0	0	2,488
DOT-112	0	1	3,618
DOT-114	0	0	3
DOT-120	307	41	164

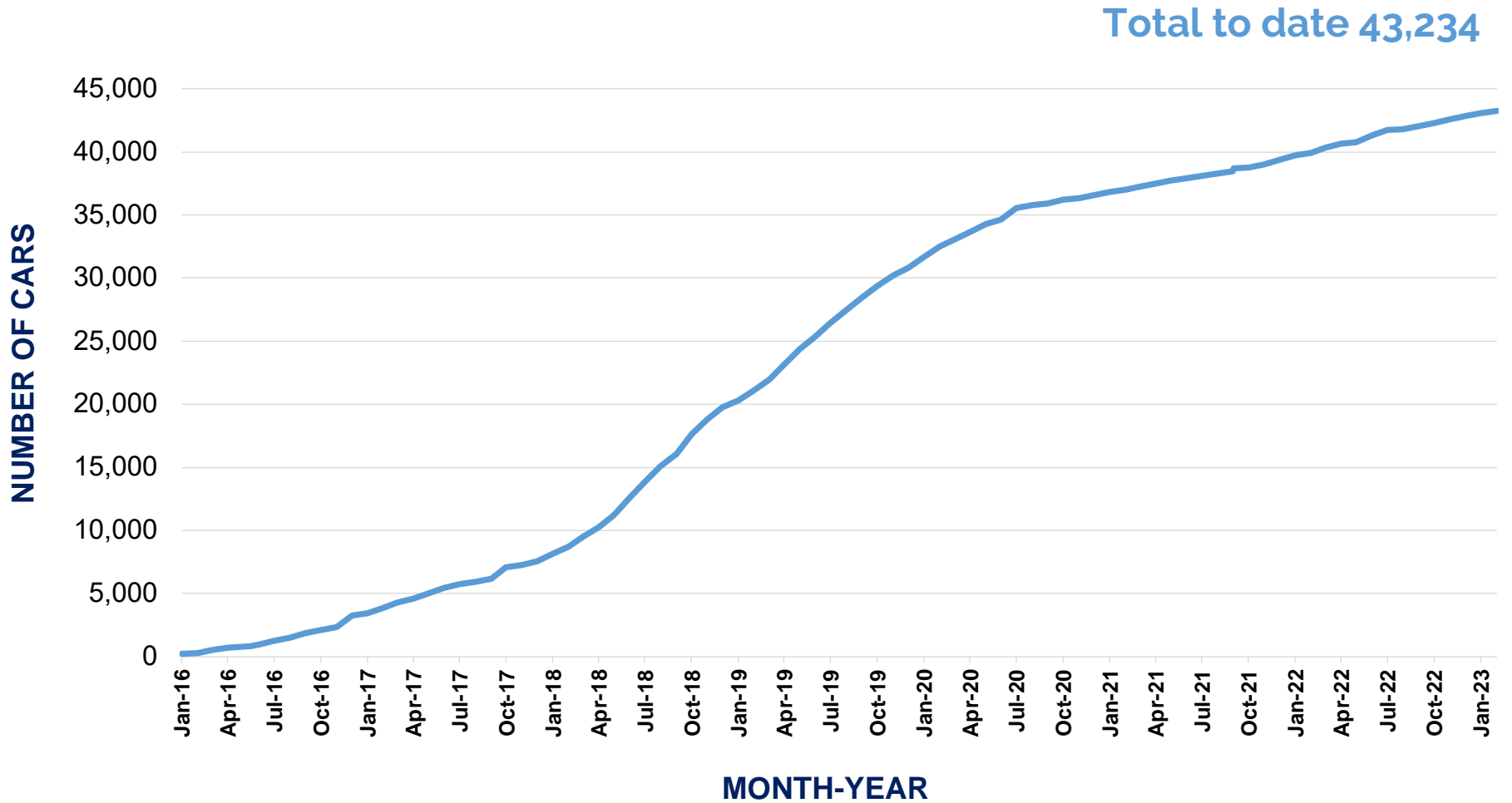
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# Growth in DOT-117J and DOT-120 Tank Car Fleet



# Growth in DOT-117R Tank Car Fleet



# Status of DOT-117 and DOT-120 Tank Cars in 2022

- 93,125 DOT-117J, DOT-117R, or DOT-120 tank cars have been produced
  - 66,250 are transporting some type of flammable liquid
  - 28,950 not transporting flammable liquids as follows:
    - 4,469 transporting other hazardous materials
    - 7,064 transporting non-regulated materials
    - 17,417 cars listed as active in Umler but made no shipments

# DOT-117 and DOT-120 Tank Cars in Service by Commodity Type in 2022

Product Transported	Tank Car Type			
	DOT-117J	DOT-117R	DOT-120	TOTAL
<b>Used in Flammable Liquid Service</b>	<b>35,720</b>	<b>30,018</b>	<b>512</b>	<b>66,250</b>
<b>Not Used in Flammable Liquid Service</b>	<b>15,252</b>	<b>13,042</b>	<b>656</b>	<b>28,950</b>
Other hazmat	2,062	2,252	155	4,469
Non-regulated material	3,107	3,955	2	7,064
Cars listed as active in Umler but making no shipments	10,083	6,835	499	17,417
<b>GRAND TOTAL</b>	<b>50,972</b>	<b>43,060</b>	<b>1,168</b>	<b>95,200</b>