

Updated Survey Report

Supply Chain and Freight Transportation Problems Escalated for Chemical Manufacturers

Q2 2022



Survey Background

Although much of the U.S. chemical production is concentrated in about a dozen states, the business of chemistry has customers located throughout the United States and around the world. Thus, a large volume of chemistry products is moved within the U.S. and to foreign destinations every year, playing an important role in the transportation services industry.

Chemical companies are some of the largest shippers across all modes of transportation. Nearly a billion metric tons of products were transported in 2021. And the industry's transportation future needs are only expected to increase as the chemical manufacturing in the U.S. grows.

With announced investments of more than \$200 billion and over 350 chemical manufacturing projects, ACC estimates more than 1 million additional chemical shipments are expected per year by 2030, including:

540,000 additional marine shipments

200,000 additional railcar shipments

600,000 additional truck shipments

Supply chain and freight transportation disruptions have caused considerable challenges and disruptions for U.S. chemical producers. These challenges can create widespread impacts in downstream sectors, including:

Food

Fuel and Energy

Water Treatment

Building and Construction

Infrastructure Projects

In December 2021, the American Chemistry Council (ACC) conducted a survey of member companies doing business in the U.S. to better understand the issues chemical manufacturers were facing. We have since conducted two follow-up surveys (March 2022 and July 2022). Each one has identified significant challenges for the efficient movement of freight across transportation modes and findings show how these challenges have impacted ACC members.

This report contains results from the July survey focusing on the second quarter of 2022. Sixty-three chemical manufacturers participated in the survey.

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This report was prepared by ACC's Economics and Statistics Department. Questions about the survey and findings may be directed to Emily Sanchez, Director, Economics & Data Analytics (emily_sanchez@americanchemistry.com).

July 2022

Key Survey Findings (Q2 2022)

GENERAL

- For three consecutive quarters, companies continued to report that supply chain and freight transportation disruptions are harming their U.S. manufacturing business. Nearly all companies report having been negatively impacted by ongoing supply chain and freight transportation disruptions.
- Among respondents, almost all companies (97%) reported they modified operations because of supply chain issues and/or transportation disruptions and delays.
- Most chemical producers (92%) report having increased inventories of raw materials/supplies on hand in response to supply chain challenges. More than half of respondents (62%) have increased inventories of finished products.
- About half of chemical producers (52%) curtailed production due to inability to ship products to customers and many companies (35%) have had customers cancel orders because they are concerned their order will not arrive or will not arrive on time.
- Transportation costs have increased across all modes of transportation over the past year for nearly all chemical producers.
- Many companies reported that they have dedicated significant additional resources and employed a range of strategies to work through freight transportation challenges.



TESTIMONIALS

"Transportation is the worst that I have seen in my 30 years in the chemical industry."

"International or domestic, rail or truck. All are worse service for more cost."

"We are paying about 45% more in freight and fuel for worse service."

"Logistics issues are impacting almost every aspect of our business."

"We continue incur higher costs for bad or worse service, specifically on rail, ocean, and trucking."

"We are onboarding new partners both for transportation and raw material supply to help mitigate capacity issues. In addition, we have increased our manpower internally to help keep up with the additional pressures of a more volatile supply chain environment."

Ports and Ocean Shipping

MAJOR PROBLEM:

Lack of containers and vessel space for exports



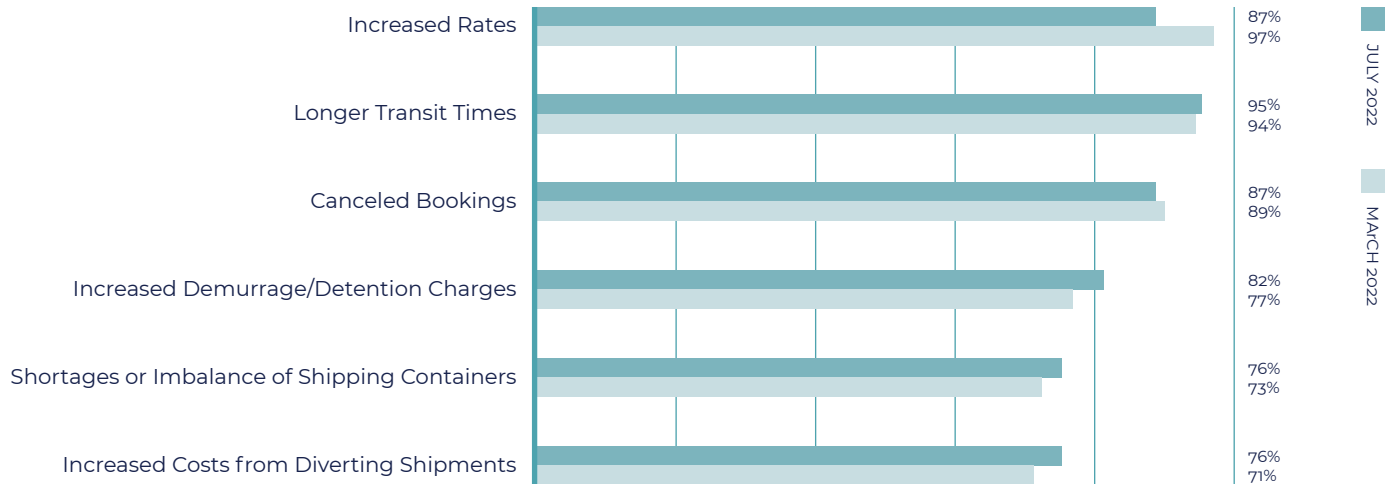
Overall, are port related delays and congestion getting worse?

	Mar 2022	Jul 2022
Worse	55%	↓ 33%
About the Same	39%	↑ 48%
Improving	6%	↑ 19%

KEY FINDINGS

- Most chemical producers reported conditions at ports and in ocean shipping are worsening or about the same. Since the 4th quarter of 2021, 33% of companies reported port related delays and congestion have gotten worse, 48% said conditions are about the same, and 19% said they are improving. When companies were asked in March 2022, 55% reported worsening conditions.
- As a result of delays and congestion at ports, nearly all companies which utilize ocean shipping to import and/or export materials and products faced increased rates (87%) and longer transit times (95%). Other business impacts in the second quarter of 2022, included cancelled bookings (87%), increased demurrage/detention charges (82%), shortages or imbalance of shipping containers (76%), increased costs from diverting shipments to alternative ports (76%), higher costs due to rerouting (63%), shortages or imbalance of specialized containers (e.g., refrigerated containers, ISO tanks) (48%), and carriers restricting/rejecting specific hazmat commodities (55%).

BUSINESS IMPACTS DUE TO DELAYS AND CONGESTION AT THE PORTS



TESTIMONIALS



"Lack of capacity in every mode is affecting ability to deliver products however ocean moves continue to present the biggest challenges at this time. Port congestion appears to be getting worse."

"Lack of available empty containers and vessel space hurting export sales."

"Containerized ocean shipping continues to experience delays to Europe and South America impacting our customers' ability to maintain production rates and meet their customer orders."

"Longer lead-times and higher costs in ocean freight has affected our customer base outside the U.S."

"For import materials shipped via marine, we have used a multi-pronged approach to improve security of supply:

- Increased lead-times
- Increased safety stocks
- Qualification of new suppliers
- Terminated shipments at port and managed inbound logistics to sites
- Conversion from ISO shipments to bulk vessel and tank terminal storage."

Rail Transportation

MAJOR PROBLEM:

Companies are being forced to add rail cars to their fleets



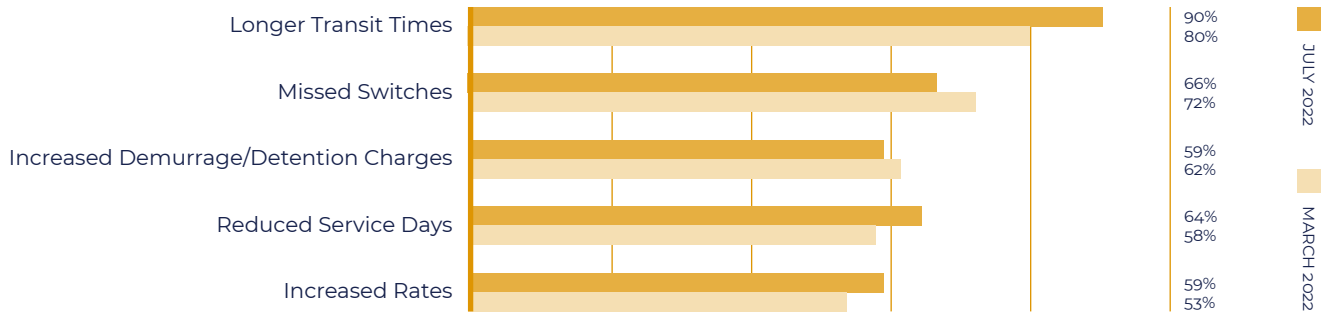
Overall, are rail transportation related delays/service challenges getting worse?

	Mar 2022	Jul 2022
Worse	39%	↑ 46%
About the Same	53%	↓ 48%
Improving	8%	↓ 7%

KEY FINDINGS

- Companies that ship by rail are increasingly reporting that railroad delays and service challenges are worse. Since 4th quarter of 2021, nearly all companies (93%) report conditions were either getting worse (46%) or were about the same (48%). A small number (7%) of companies reported that overall, rail transportation related delays/service challenges have improved.
- A large number of rail users reported longer transit times (90%), missed switches (66%), increased demurrage charges (59%), reduced service days (64%), and higher rates (59%).
- Many (43%) of companies report they have added tank cars to their fleet because of freight rail service issues.

BUSINESS IMPACTS DUE TO DELAYS/SERVICE CHALLENGES IN RAIL TRANSPORTATION



TESTIMONIALS



"In rail, the situation seems to be getting worse. We are seeing longer transit times as well as customer holds."

"Not having railcars switched in or at terminals/customers causing production slowdown/shutdown."

"Rail service levels have been inconsistent in some regions, resulting in increased use of truck shipments to supplement."

"Insufficient trained labor is resulting in increased transit times to and from our customers. This results in supplementing railcars with trucks in an emergency, finding alternate modes of transportation (barge) and increases in railcar fleet sizes. In addition, companies."

"Resourcing challenges in the rail sector continue to cause delays with transit times remaining a concern."

Trucking

MAJOR PROBLEM:

Lack of drivers and rising shipping rates



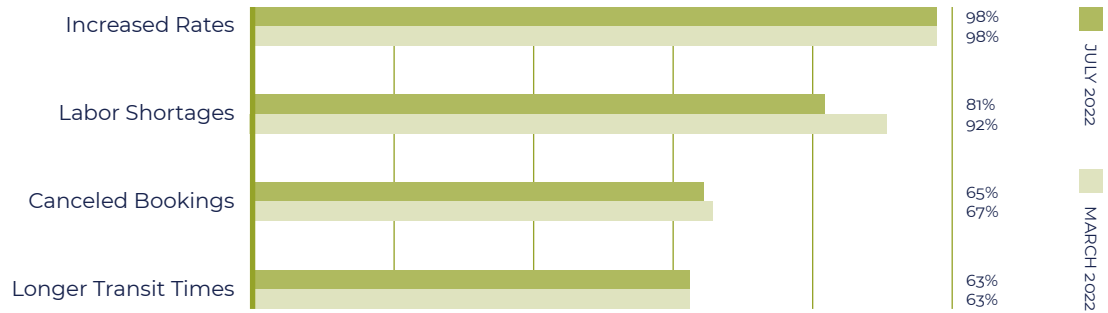
Overall, are truck transportation related delays and capacity constraints getting worse?

	Mar 2022	Jul 2022
Worse	55%	↓ 29%
About the Same	38%	↑ 45%
Improving	8%	↑ 26%

KEY FINDINGS

- The survey suggests some easing of concerns related to trucking delays and capacity constraints. Since the 4th quarter of 2021, 29% of companies reported the conditions had gotten worse, while 26% reported that conditions had improved and 45% reported no change. When asked in March 2022, 55% reported conditions were worse and only 8% reported that conditions had improved.
- There was no relief in terms of increased rates. Nearly all companies (98%) continue to report increased trucking rates.
- Labor shortages are a growing challenge with 81% of companies reporting that the constraint has impacted their business. 63% of companies reported longer transit times.
- 65% of companies reported additional delays for shipping hazardous materials.

BUSINESS IMPACTS DUE TO DELAYS AND CAPACITY CONSTRAINTS IN TRUCK TRANSPORTATION



TESTIMONIALS



"For ground transportation, lack of drivers- although improving – and bulk equipment is still impacting service levels."

"Truck capacity is impacting our ability to respond to emergencies, where we would leverage trucking for faster shipments."

"Shortage/delay of raw materials causing frequent changes in production schedule. It is hard to plan into the future because of so much uncertainty."

"Tank truck shipments are extremely difficult to book, and we've had to rebook loads with customers numerous times. Tank truck cost has more than doubled."

Inland Waterways



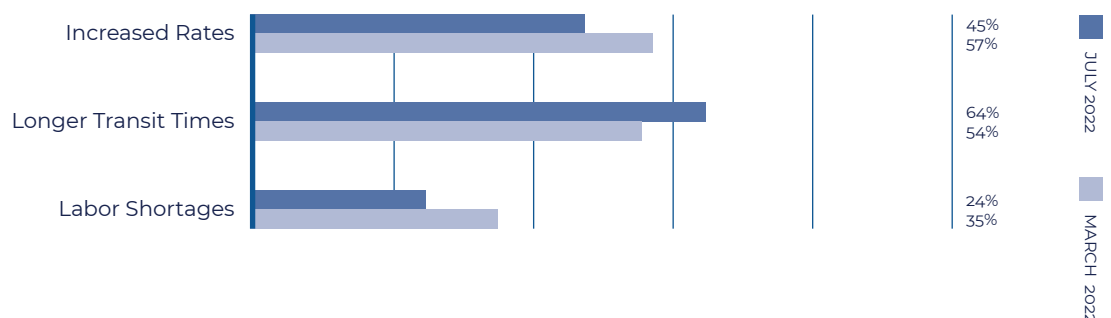
Overall, are inland waterways transportation related delays and congestion challenges getting worse?

	Mar 2022	Jul 2022
Worse	21%	↓ 13%
About the Same	68%	↑ 77%
Improving	12%	↓ 10%

KEY FINDINGS

- Companies using inland waterways generally reported fewer impacts than seen in other modes. However, 64% of those companies reported longer transit times and 45% reported increased rates due to delays and congestion in inland waterways transportation are impacting their business. Labor shortages also impacted business.
- Most companies (77%) reported that waterways congestion and delays had not changed significantly. Ten percent reported that conditions were improving and 13% say they were getting worse in the second quarter of 2022. This is an improvement from 1st quarter when 21% said conditions were worse.

BUSINESS IMPACTS DUE TO DELAYS AND CONGESTION IN INLAND WATERWAYS TRANSPORTATION



Details Survey Findings & Company Responses

Based on 63 responses.

1. Overall, have the ongoing supply chain and freight transportation disruptions impacted your company's US chemicals manufacturing business?

Yes	62	98%
No	1	2%

2. Has your company needed to modify your operations because of supply chain issues and/or transportation disruptions and delays?

Yes	61	97%
No	2	3%

3. Has your company increased inventories of raw materials/supplies on hand in response to supply chain challenges? Please respond "yes" or "no" and provide a brief explanation.

Yes	58	92%
No	5	8%

4. Has your company increased inventories of finished products in response to supply chain challenges? Please respond "yes" or "no" and provide a brief explanation.

Yes	38	62%
No	23	38%

5. Has your company curtailed production due to inability to ship products to customers? Please respond "yes" or "no" and provide a brief explanation.

Yes	33	52%
No	30	48%

6. Has your company curtailed production due to inability to ship products to customers? Please respond "yes" or "no" and provide a brief explanation.

Yes	22	35%
No	41	65%

7. Have your company's transportation costs increased over the last year because of supply chain issues and/or transportation disruptions/delays? Please respond "yes" or "no" and provide a brief explanation.

Yes	61	97%
No	2	3%

8. Does your company utilize ocean shipping for importing materials?		
Yes	61	97%
No	2	3%
9. Does your company utilize ocean shipping for exporting products?		
Yes	59	94%
No	4	6%
62 companies (98% of total) utilize ocean shipping for importing and/or exporting products.		
10. Overall, since the 4th quarter of 2021, have port related delays and congestion gotten worse?		
	Q1	Q2
Worse	55%	33%
Improving	6%	19%
About the Same	39%	48%
11. How are delays and congestion at the ports impacting your business?		
	Q1	Q2
Longer transit times	94%	95%
Cancelled bookings	89%	87%
Shortage or imbalance of shipping containers	73%	76%
Shortages or imbalance of specialized containers (e.g., refrigerated containers, ISO tanks)	55%	48%
Carriers restricting/rejecting specific hazmat commodities	47%	55%
Increased costs from diverting shipments to alternative ports	71%	76%
Increased demurrage/detention charges	77%	82%
Increased rates	97%	87%
Higher costs due to rerouting	63%	63%
Security/theft risks for loaded containers stored outside of ports	8%	11%
12. Does your company utilize rail shipping?		
Yes	61	97%
No	2	3%

13. How are delays/service challenges in rail transportation impacting your business?

	Q1	Q2
Longer transit times	80%	90%
Missed switches	72%	66%
Reduced service days	58%	64%
Increased demurrage/detention charges	62%	59%
Increased rates	53%	59%

14. Overall, since 4th quarter of 2021, have rail transportation related delays/service challenges gotten worse?

	Q1	Q2
Worse	39%	46%
Improving	8%	7%
About the same	53%	48%

15. Has your company added tank cars to your fleet because of freight rail service issues?

Yes	26	43%
No	34	57%

16. Does your company utilize truck shipping?

Yes	63	100%
No	0	0%

17. How are delays and capacity constraints in truck transportation impacting your business?

	Q1	Q2
Longer transit times	63%	63%
Additional delays or challenges shipping hazardous materials	67%	65%
Increased rates	98%	98%
Labor shortages	92%	81%

18. Overall, since 4th quarter of 2021, have truck transportation related delays and capacity constraints gotten worse?

	Q1	Q2
Worse	55%	29%
Improving	8%	26%
About the same	38%	45%

19. Does your company utilize inland waterways shipping?		
Yes	33	52%
No	31	48%

20. How are delays and congestion in inland waterways transportation impacting your business? Note: Frequencies presented are a percent (%) of companies using inland water transportation		
	Q1	Q2
Longer transit times	54%	64%
Increased rates	57%	45%
Labor shortages	35%	24%

21. Overall, since the 4th quarter of 2021, have inland waterways transportation related delays and congestion challenges gotten worse?		
	Q1	Q2
Worse	21%	13%
Improving	12%	10%
About the Same	68%	77%

