Building Insights to Plan for 2045

FUTURE THINKERS BREAKBULK AMERICAS

2026 REPORT

Held in conjuction with
Breakbulk Americas, Houston, Texas



HELD IN CONJUNCTION WITH BREAKBULK AMERICAS · HOUSTON

THE REGIONAL MEETING

Industry leaders, academics and a student met at the Houston Maritime Center & Museum on Sept. 23, 2026, to work through four questions facing project cargo.



Future Thinkers Americas at the Houston Maritime Center & Museum, Sept. 23, 2026.

27	4	4	2
PARTICIPANTS	WORK GROUPS	SHARED QUESTIONS	PRESENTATIONS

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Building Insights to Plan for 2045

FUTURE THINKERS BREAKBULK AMERICAS

Regional meeting held Sept. 23, 2026, at the Houston Maritime Center & Museum, in conjunction with Breakbulk Americas.

INTRODUCTION

Leslie Meredith,
Product & Editorial Director

We started Future Thinkers in Houston in October 2025 with a long view. The goal was an ongoing industry conversation about what project cargo and breakbulk will need between now and 2045.

Nearly a year later, after regional meetings in Dubai and Rotterdam, we came back to Houston with a clearer picture of what has stayed the same and what needs more of our attention.

Our tables keep getting more interesting. Robert Doty of Relativity Space opened his introduction with a disclaimer. "I don't really consider myself a breakbulk person. I mean, I ship a rocket," he said. Then he described the infrastructure his company is building on military bases just to move one, with production headed toward 50 rockets a year. Space logistics is new territory for us, and we'll be covering it in 2027.

The fundamentals haven't changed. Logistics needs a seat at the table earlier in project planning. Companies need better information across organizational lines. And the industry still needs people who understand both operations and technology, working together across the project cargo community.

What has changed is the weight behind those issues. Trade-route disruption and tight capacity are now hitting schedules, budgets and contracts. Cybersecurity is part of port operations. AI has become a working tool, and it brings new questions about governance, skills and judgment. Again and again, our work groups came back to recovery speed, schedule contingency and how companies, competitors included, coordinate when no one controls the whole operation.

That's why we built the Americas meeting the way we did. Mohammad Jaber, CEO of Combi Lift Projects MEA, works in the middle of the disruption around the Strait of Hormuz. We asked him to bring that firsthand knowledge to Houston and show what it means for U.S. companies and for project cargo worldwide. Dr. John Wilson of San Jacinto College brings expertise from the Department of Defense and Port Houston. His method for mapping cyber risk was built for ports, but every sector at the table could be hurt by a cyberattack, so we wanted everyone to hear it. Then four work groups took on the same four questions from their own corners of the industry.

Thank you to the Houston Maritime Center & Museum for hosting us. We couldn't have picked a better room. The museum's new East River home put Houston's maritime history right beside a group working out what the industry needs next.

Our last regional stop of 2026 is Singapore, where Future Thinkers will meet for a working lunch on Tuesday, Nov. 17, at Marina Bay Sands ahead of Breakbulk Asia. The setting changes, but the purpose stays the same: get people with different jobs into the same conversation and leave with actions the industry can use.

If you'd like to be part of Future Thinkers, contact us to join the community



Leslie Meredith welcomes Future Thinkers to the Houston Maritime Center & Museum.

HOW THE MEETING WORKED

1. **Set the context**
   Mohammad Jaber brought firsthand knowledge of the disruption around the Strait of Hormuz. Dr. John Wilson showed how to map cyber risk, a threat to every sector.
2. **Form four work groups**
   Maritime & Ports (5), Supply Chain & Logistics (9), Energy & Infrastructure Projects 1 (7) and Projects 2 (6).
3. **Ask the same four questions**
   U.S. manufacturing, trade routes and chokepoints, planning for uncertainty, and AI and workforce.
4. **Report back and compare**
   Each group presented to the room. This report compares the answers and draws out what they share.

HOW THIS REPORT IS ORGANIZED

PART 1	PART 2	PART 3	PART 4
The Work Groups	The Super Session	Expert Perspectives	Taking Action

PART 1 · WORK GROUP 1 OF 4

MARITIME & PORTS

Stay Mobile as Trade Splits Along Political Lines

The group saw less evidence of a U.S. manufacturing boom than of geopolitics redirecting cargo. Its advice is to keep fleets mobile, expect selective access at chokepoints and let risk show up in the price.

KEY TAKEAWAYS

- Look to energy-related project cargo. A broad consumer manufacturing revival is unlikely.
- Expect chokepoints to stay open but with access that depends on flag, ownership and alignment.
- Keep vessels mobile and hold spare capacity for sudden peaks.
- Don't count on carriers returning the day a route is declared safe.

THE WORK GROUP



GEIR-EILIF KALHAGEN

Maritime Division Director
Texas Department of Transportation



DR. THEO NOTTEBOOM

ACADEMIC

Professor
University of Antwerp and Antwerp Maritime Academy



DR. JEAN-PAUL RODRIGUE

ACADEMIC

Professor, Department of Maritime Business Administration
Texas A&M University at Galveston



ANDERS HYRUP

Vice President Sales and Projects USA
JSI Alliance



DR. JOHN WILSON

ACADEMIC

Professor of Economics; Public Sector Strategist
San Jacinto College; Entellect LLC



The Maritime & Ports work group. Clockwise from left: Geir-Eilif Kalhagen, Dr. John Wilson, Leslie Meredith, Dr. Theo Notteboom, Anders Hyrup and Dr. Jean-Paul Rodrigue.

Trade is moving before manufacturing does

A U.S. manufacturing revival holds obvious promise for project cargo, but the Maritime & Ports group wasn't convinced a broad boom is underway. What members could see was geopolitical disruption redirecting cargo, changing sourcing and creating demand on trade lanes that weren't built for today's flows.

Wilson questioned whether U.S. industrial policy is producing its intended results, pointing to the trade deficit and manufacturing wages. Notteboom separated consumer manufacturing, where he sees little chance of a major U.S. resurgence, from industrial sectors tied to project cargo, including energy.

Hyrup said global crises are already shifting sourcing. Drill rigs and related cargo for Iraqi oil fields that once would have been sourced through the Middle East are moving from U.S. ports to Türkiye, adding to congestion at Turkish ports.

Imports complicate the reshoring story. Kalhagen pointed to imported pipe that receives specialty coating or other value-added work in the U.S. before moving on. Hyrup said tariffs haven't removed the need for imported pipe because domestic production can't meet demand. In some cases, replacing import quotas with tariffs let overseas suppliers sell more into the U.S. market, as long as customers were willing to absorb the extra cost.

Shipbuilding could add project cargo without bringing the whole supply chain home. Kalhagen questioned whether the U.S. first needs to rebuild the infrastructure to build ships at scale. One model he suggested is globally sourced modules assembled in U.S. yards.

Defense spending is creating heavy transport work

Notteboom said European spending is moving away from some green-transition subsidies

and toward military capability, including military mobility corridors linking seaports with eastern Europe. Rail must be reinforced and highways upgraded to carry heavy equipment.

Kalhagen cited a U.S. parallel in efforts to improve connections between military ports, including Beaumont. Rodrigue placed both within a wider split in global trade. Consumer goods may keep moving through global supply chains, while strategic commodities and raw materials reorganize around geopolitical relationships.

> There are two trade systems in the world: trade by convenience ... [and] trade by necessity.
>
> **Dr. Jean-Paul Rodrigue**
> Texas A&M University at Galveston

Project carriers need room to follow the cargo

In a less predictable trading system, concentrating on a single route is risky. Notteboom said fleet owners should keep the flexibility to redeploy vessels and other mobile assets as markets change. They also need enough spare capacity to catch sudden peaks in demand without leaving equipment idle when conditions shift.

Hyrup said project carriers face a different investment equation from larger shipping sectors. Many project shipowners are privately held and can't absorb a poor vessel investment as easily as operators with deeper pools of capital. Meanwhile, heavy ordering of container ships and tankers is tying up global shipbuilding capacity.

Chokepoints may divide traffic instead of stopping it

The group worried less about a full closure than about access becoming selective.

Asked about the Panama Canal, neither Notteboom nor Hyrup saw Chinese control as the immediate concern. Notteboom pointed instead to the South China Sea as a possible source of future disruption. His larger concern is chokepoints that stay technically open while access, cost and risk depend on the nationality, ownership or political alignment of the vessel and cargo.

Rodrigue saw the possibility of routes aligning with trading blocs. The Red Sea offers a preview. The group noted that some Chinese-linked shipping kept using the route while many Western operators stayed away. Hyrup added that a carrier may be willing to transit, but the cargo owner also has to accept the risk.

A reopened route doesn't bring ships back right away

Carriers won't necessarily rush back into a region the day a route is declared safe, Hyrup said. After repeated disruption, they will want evidence that conditions have stabilized before committing vessels.

That lag could collide with reconstruction. Hyrup expects substantial cargo from rebuilding in the Middle East, and Notteboom pointed to the infrastructure and industrial work that could follow a durable peace in Ukraine. Both would draw on a limited pool of multipurpose and heavy-lift vessels already busy in other markets.

Risk has a price

Operating through disruption comes down to what risks carriers, cargo owners, crews, insurers and governments are prepared to accept. Insurance alone doesn't solve it.

Kalhagen said losing a specialized vessel can mean losing revenue that insurance can't quickly replace, because another suitable ship may not be available. Hyrup said flag-state restrictions can take routes off the table regardless of the economics, and responsible operators weigh the exposure of crews and cargo alongside the vessel.

Rodrigue argued against suppressing price signals. Higher prices communicate scarcity, congestion and risk, and they steer where capacity goes. Hyrup pointed to LNG development on Canada's West Coast as an example of geography as a commercial advantage, with direct Pacific access to Asia and no canal transit.



Geir-Eilif Kalhagen, Texas Department of Transportation, reports for Maritime & Ports.

PART 1 · WORK GROUP 2 OF 4

SUPPLY CHAIN & LOGISTICS

Reshoring Starts With Imports

Building U.S. factories will take years of imported machinery first. The group also found fixed-price logistics contracts colliding with risks no one can price.

KEY TAKEAWAYS

- Expect the first wave of reshoring cargo to be imported machinery.
- Plan for labor and permitting to slow growth as much as freight capacity.
- Add West Coast port and inland heavy-haul capability in case Panama routings change.
- Rewrite lump-sum logistics terms to account for disruption.

THE WORK GROUP



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Hatch



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Managing Director - USA
HLI Rail & Rigging



FRANK GUZMAN
Senior Director, Project Logistics Global
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Senior Vice President, U.S. Operations
UTC Overseas



The Supply Chain & Logistics work group.

Reshoring could create imports before it replaces them

Bringing manufacturing back to the U.S. sounds like a straight line to domestic industrial growth. For project logistics, the path is less direct. Building that capacity could take years of imported machinery, equipment and materials before new plants produce at scale.

Members disagreed on how much U.S. manufacturing will grow, but most doubted reshoring would change project cargo flows within three to five years. Kidd pointed to pharmaceuticals, where substantial investment is already underway, including Eli Lilly's $6.5 billion investment at Generation Park in Houston. Guzman said C.H. Robinson is seeing companies explore reshoring and alternative sourcing as tariff policy changes supply chain economics.

Davila saw the nearer-term opportunity in the equipment needed to make those investments happen. A product may be made in the U.S., she said, while the machinery that makes it still comes from established manufacturing centers overseas.

> "We probably will be importing a lot more because it's going to be machinery.
>
> **Diana Davila**
> UTC Overseas

Labor may be a harder limit than freight

Manufacturing investment depends on people to build plants, run them and support the logistics around them.

Mohammad Jaber pointed to shortages in trucking and other logistics jobs, arguing that automation can't remove the need for skilled people across the physical supply chain. In the Middle East, when foreign drivers stopped

arriving, truck driver costs went from $2,000 to $4,000, he said. Devlin added cost and regulation to the equation. Zaid Jaber, Mohammad Jaber's son and an industrial engineering student at Arizona State University, questioned whether permitting and other structural limits will let U.S. capacity grow as fast as policy goals suggest.

As the student at the table, Zaid kept bringing the discussion back to what those limits mean for oversized and heavy cargo. Tariffs can raise the cost of project logistics equipment itself, he said, citing specialized trailers.



Zaid Jaber, Arizona State University, brought the student perspective to the Supply Chain & Logistics table.

Panama exposure puts pressure on the West Coast

The Panama and Suez canals were the group's two main route concerns. For North American project cargo, the Panama question quickly became an infrastructure question.

Guzman said West Coast ports need more capability to receive project cargo if routings change. The constraint doesn't stop at the berth. Heavy cargo must be permitted and moved inland, and he pointed to the difficulty of securing permits and suitable heavy-haul routes from California ports.

That makes route resilience as dependent on landside infrastructure as on maritime alternatives. Diverting a vessel does little good if the receiving port can't handle the cargo or the road network can't move it onward.

Fixed-price logistics meets geopolitical risk

The group split over how project owners and logistics providers should allocate costs neither side can reliably predict.

Jaber said war, canal disruption and volatile fuel costs have changed his willingness to accept lump-sum contracts. He wants cost-plus or open-book arrangements that protect contractors from absorbing severe outside cost increases.

> "I'm not willing to sign any more on a lump sum.
>
> **Mohammad Jaber**
> Combi Lift Projects MEA

Davila immediately raised the owner's side. A project still needs a financeable cost. A logistics provider may need flexibility, but an owner still needs a budget to support the investment decision.

Force majeure doesn't necessarily resolve the conflict, Jaber said. Contractors can end up carrying costs for long periods while claims work through the project chain, an exposure that can become unsustainable in a major disruption.

Guzman agreed contracts need to change but widened the issue beyond cost-plus pricing to earlier commitments, closer collaboration and terms that address disruption. Some risks can be insured or transferred, but commercial risk has to sit somewhere.

Bourque described how that plays out at Hatch. Project risk reviews now examine sourcing, tariffs and routing item by item, down to whether Canadian counter-tariffs mean pumps and tanks should be bought somewhere other than the U.S. "At the end of the line, if there's too much risk, they'll just cancel the project," he said.

> "At the end of the line, if there's too much risk, they'll just cancel the project.
>
> **Jean-François Bourque**
> Hatch

Vicens noted that carriers are adding fleet capacity to adapt. Others at the table said that isn't happening in breakbulk, where shipyards are busy with container ships and owners don't see enough return to build.

AI needs better data and physical automation

The group saw practical uses for AI in data analysis, predictive analytics, tracking, visibility and productivity. The obstacle is more basic. Parts of the logistics chain still run on paper and fragmented information.

Davila pointed to the need to move ports from paper processes to electronic systems. Jaber said AI must be paired with physical automation and robotics. Predictive systems are only as useful as the data going into them.



Margaret Kidd, San Jacinto College, reports for Supply Chain & Logistics.

PART 1 · WORK GROUP 3 OF 4

ENERGY & INFRASTRUCTURE PROJECTS 1

Announced Investment Isn't Cargo Yet

Manufacturing growth will test the ports, roads, rail and approvals around it. The group warned that faster schedules and late logistics involvement leave no room to absorb disruption.

KEY TAKEAWAYS

- Separate funded projects from announcements. Power and data centers show momentum.
- Treat weather-driven chokepoints as longer lasting than conflict-driven ones.
- Protect schedule contingency at the top of the contracting chain.
- Digitize project records so AI has something to work with.

THE WORK GROUP



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JONATHAN COURNOYER
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ROBERT DOTY
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Relativity Space



SINDHU DASAN
Project Manager - Logistics
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SAM HOLMES
Founder
Emerger; Bechtel Corp.



CYRIL VARGHESE
Global Logistics Director
Fluor



Cyril Varghese, Fluor, and participants from Relativity Space.

Manufacturing growth will test the infrastructure around it

Cournoyer said U.S. projects still rely heavily on globally sourced materials and equipment. He doubted domestic manufacturing could expand enough within five years to support the volume of projects in development.

Holmes saw the same constraint. Manufacturing capacity takes years to build, and the equipment for new factories may have to come from established overseas suppliers. Even with U.S. investment rising, he said, a supply chain that could support current growth entirely through domestic manufacturing would be hard to reach within five years.

Doty brought the issue down to a specialized cargo: rockets. Relativity Space's growth requires infrastructure at military bases and other sites used to move and operate its rockets. Even when the company is ready to pay for improvements itself, Doty said, approvals and construction take considerable time. Infrastructure is already tight for today's rocket movements, and the company is preparing for production that could reach 50 rockets a year within the next few years.

> If you start building manufacturing and don't think down the road of everything that's going to be needed, then you're going to have that bottleneck for a long time.
>
> **Robert Doty**
> Relativity Space

Dasan saw an opening in the good times. While the U.S. market is strong, Dasan said, it's a good time to build contingency plans and invest strategically, including in renewables.

Announced investment is not the same as cargo

Varghese said some U.S. investments are tied to specific agreements and spending commitments and are likely to proceed. Elsewhere, companies must decide whether tariff protection and other policies will last long enough to justify capital investments with payback periods that run well past a single administration.

The math can shift mid-build. Companies may import the machinery and steel for a U.S. plant and pay tariffs during construction. If the finished plant later loses the cost advantage that justified it, the business case changes.

Gangrade saw similar hesitation. Large investments have been announced, but he questioned whether they are producing a matching rise in manufacturing activity yet.

Power and data centers are different. Varghese sees actual investment and momentum in those sectors, though supporting infrastructure, including transformer moves and rail capability, remains a concern.

Some chokepoints have alternatives, others don't

The group named the Strait of Hormuz, Bab el-Mandeb, Panama Canal and Strait of Malacca as routes requiring attention, but it didn't treat them as equal risks.

Dasan pointed to Hormuz and Bab el-Mandeb for their role in global oil flows. Dasan also worried that nearby states claiming control of the Strait of Malacca could set a precedent for other passages. Gangrade noted that Malacca has workarounds that add about three to four days.

Varghese separated geopolitical disruption from environmental constraints. Conflicts get resolved, he said, but droughts in Panama and weather events don't have such an easy end.

The group's recommended action for chokepoints was short. "So recommended actions for that is peace. Simple, right?" Holmes said when reporting for the group.

Faster schedules leave no room for disruption

"If you work in the EPC, we plan projects five years and three years in advance. Today, we're making decisions probably day by day, or maybe within 24 hours," Holmes said.

The group pointed to schedule contingency and strategic relationships as defenses. Cournoyer said overseas purchases that once needed six weeks in the schedule now get 10 or 12. Varghese described Americas projects switching from Middle East steel to domestic steel to avoid disruption, even though U.S. mills often can't match the schedule for the volume a large project needs. "The only way capital project can move would be to build in more contingency, price the risk and extend the schedule," he said.

> "The only way capital project can move would be to build in more contingency, price the risk and extend the schedule.
>
> **Cyril Varghese**
> Fluor

Cournoyer named the contradiction: clients want schedules expedited just as those risks make them harder to guarantee. "That's the magic word in this table, schedule," Amos said.

The squeeze runs down the contracting chain. An EPC may accept an aggressive schedule and pass the requirements to logistics providers and subcontractors, who have little room left to absorb disruption. Gangrade said disputes are piling up as costs pass from client to EPC to logistics provider, with extra freight-related costs reaching 200% to 300% before liquidated damages.

For Amos, the problem starts even earlier. Logistics is still too often brought into a project after major decisions are made.

> "Decisions are made, contracts are written, and then they say, 'Oh yes, I guess we're going to have to ship things.'
>
> **John Amos**
> Amos Logistics

AI can put project experience to work

Holmes saw a practical use for AI in the experience EPCs and project organizations already hold. Companies that have sourced equipment from many origins and executed projects in different markets have substantial operational data. AI could make it easier to analyze and use when planning new projects, so teams reach decisions faster.

The starting point is still digitization. Information still passes manually between stakeholders, Holmes said, with engineering, purchase-order and other data repeatedly transferred into spreadsheets.



Sam Holmes, Emerger, reports for Energy & Infrastructure Projects 1.

PART 1 · WORK GROUP 4 OF 4

ENERGY & INFRASTRUCTURE PROJECTS 2

Bring Transport Into the Design Room

Logistics teams are pricing projects that won't move until 2031 or 2032. The group's answer is earlier engineering collaboration and a wider view of capacity.

KEY TAKEAWAYS

- State plainly what long-range logistics budgets can't know.
- Ask why the cargo is moving before quoting how.
- Bring transport engineers into equipment design.
- Automate documentation and tracking. Keep judgment with specialists.

THE WORK GROUP



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The Energy & Infrastructure Projects 2 work group.

Projects are being priced years before they move

Harriague pointed to proposals now being developed for projects expected to execute in 2031 or 2032. Owners still need budgets, and logistics teams are expected to supply numbers with little visibility into freight markets, geopolitics or capacity that far out. Internally, he said, logistics and supply chain teams are seen as the people closest to the market and so are expected to have the answer.

The issue goes beyond forecasting freight rates. A project conceived today may face different trade policies, transport capacity, route conditions and equipment availability by the time it moves.

Boumerkhoufa argued for better visibility instead of pretending those variables can be predicted. Understand the project well enough to assess costs, lead times and options, he said, while acknowledging what remains unknown.

Strom starts with a question. He teaches his staff to ask the client why. "Why are you moving this transformer?" he said. Knowing the purpose, the end use and the timing lets a provider work back to the risks.

Transport belongs in the design process

Boumerkhoufa described working directly with engineers when cargo doesn't fit within an aircraft's operating envelope. Instead of accepting that a move can't be done, the transport provider's engineers worked with the customer's engineers and technical drawings to find what could change. The options keep narrowing, he added, since Boeing stopped building the 747 freighter.

Harriague asked how often logistics providers are invited into engineering workshops five years before new equipment is deployed. Rarely, the group agreed. Singh expects cost to force the change. When options disappear

or prices climb, companies will plan logistics early, he said, because otherwise "you'll pay a lot more in shipping than you are spending on building."

> You'll pay a lot more in shipping than you are spending on building.
>
> **Dr. Gulshan Singh**
> University of Houston

Strom extended the point beyond the major components. A transformer may come with large volumes of smaller equipment and materials that also have to arrive for installation and construction.

Capacity is an ecosystem

The group treated capacity as broader than available vessels, aircraft or heavy-haul equipment.

Harriague described the power-generation market as an ecosystem in which strong demand meets limits in turbine output, EPC construction labor and transportation. Strom added the wider supply chain needed to deliver everything that goes with major equipment. Boumerkhoufa boiled the principle down to finding gaps early enough to close them.

Let AI take the admin work, not the judgment

Strom saw the immediate opportunity in efficiency. Ocean carriers, air carriers and trucking companies remain disconnected, leaving logistics staff to handle many processes by hand. "Updating a spreadsheet two hours every day is not productive," he said.

Project cargo tracking still runs on charter emails. Parcel carriers can show where a small package is at every step, but the business case for the same visibility on a 250-ton piece isn't there yet, the group said.

Harriague and Kerr separated central work such as project management and engineering from tasks such as documentation and tracking that could be automated. McNamara drew the line at professional judgment. A project manager facing a tough call, he said, will find that "a machine will not make that decision for you." Harriague also warned against hype: "Not everything has to have an AI sticker on it."

Singh's recommendation centered on training and education so the workforce develops alongside the technology. He also urged companies to build their IT and operational technology infrastructure now, so they can plug in new tools when they become available and affordable.

How the two project groups compare

The two Energy & Infrastructure Projects groups reached the same conclusion by different routes: logistics has to enter the project earlier.

Group 1 got there through infrastructure and execution. Doty's rocket movements showed what happens when production outgrows the facilities that support it, and Amos described logistics arriving after contracts are written. The group's concern was investment moving ahead without enough thought for the ports, roads, rail, approvals and transport systems behind it.

Group 2 got there through engineering and long-range planning. Its members focused on projects budgeted years before execution, equipment designed before logistics requirements are fully considered and capacity limits that reach into manufacturing and construction.

On U.S. industrial growth, Group 1 questioned how much announced investment will advance and whether infrastructure can keep pace. Group 2 asked whether the full project system can deliver against visible power and industrial demand.

On uncertainty, Group 1 stressed schedule contingency and rerouting. It separated geopolitical disruptions that may eventually resolve from constraints such as Panama Canal water levels that persist regardless of politics. Group 2 focused on the uncertainty that comes with time itself: setting budgets now for projects executing in 2031 or 2032.

The groups were closest on AI. Neither treated it as a substitute for project expertise. Group 1 wants to use historical project and sourcing data to speed decisions. Group 2 wants to automate repetitive administration while people keep control of engineering and project decisions. Both said useful digital information has to exist first.

Together, the groups found a gap between how major projects are conceived and the physical systems needed to deliver them. Group 1 saw it in infrastructure and schedules. Group 2 saw it in engineering, capacity and long-range forecasting. The fix is the same for both: bring logistics in while the project can still change.



Agustin Harriague, Mitsubishi Power Americas, reports for Energy & Infrastructure Projects 2.

WORK GROUP PERSPECTIVES COMPARED

With the group discussions in hand, here are all four groups' answers side by side.

MARITIME & PORTS · SUPPLY CHAIN & LOGISTICS · ENERGY & INFRASTRUCTURE PROJECTS 1 · ENERGY & INFRASTRUCTURE PROJECTS 2

1 U.S. MANUFACTURING

How will U.S. manufacturing growth affect project cargo and breakbulk over the next five years?

MARITIME & PORTS

No broad consumer revival. Energy cargo is the opportunity, and disruption is already redirecting oilfield cargo through U.S. ports.

ACTION

Stay flexible as trade and sourcing shift.

SUPPLY CHAIN & LOGISTICS

Little near-term impact outside pharmaceuticals and semiconductors. Labor costs and regulation hold the U.S. back.

ACTION

None specified.

ENERGY & INFRASTRUCTURE PROJECTS 1

Infrastructure, approvals, community concerns and tariff uncertainty can keep announcements from becoming projects.

ACTION

Cut regulatory delay and make policy predictable.

ENERGY & INFRASTRUCTURE PROJECTS 2

Power demand is outrunning turbine output, EPC capacity and construction labor. Equipment is getting bigger.

ACTION

Bring logistics into equipment design and capacity planning.

BOTTOM LINE No group expects a broad manufacturing boom. The cargo is in energy, power and a handful of targeted sectors.

2 GLOBAL TRADE ROUTES AND CHOKEPOINTS

Which global trade routes and chokepoints require the most attention over the next five years?

MARITIME & PORTS

Black Sea, Hormuz and the South China Sea. The bigger risk is access decided by politics.

ACTION

Clarify who protects access and enforces passage.

SUPPLY CHAIN & LOGISTICS

Panama and Suez. West Coast project cargo capacity needs work.

ACTION

Study physical alternatives and the federal policy to expand capacity.

ENERGY & INFRASTRUCTURE PROJECTS 1

Hormuz, Bab el-Mandeb, Panama and Malacca. Weather limits may outlast conflict.

ACTION

Plan reroutes and schedule contingency.

ENERGY & INFRASTRUCTURE PROJECTS 2

No single chokepoint. Conditions, security and compliance change across every mode.

ACTION

Review route risk with the customer at launch and keep it current.

BOTTOM LINE Watch the named passages, but plan for selective access and shifting conditions, not only closures.

3 PLANNING FOR UNCERTAINTY

What needs to change in the way the industry plans for continued geopolitical, trade and market uncertainty?

MARITIME & PORTS

Planning for change never stops. Spread liability and let each party set its own risk tolerance.

ACTION

Let the market allocate risk.

SUPPLY CHAIN & LOGISTICS

Contracts need cost-plus options, workable terms and closer owner-supplier collaboration.

ACTION

Use contracts that support partnership when conditions change.

ENERGY & INFRASTRUCTURE PROJECTS 1

Clients push risk down to EPCs, providers and subcontractors.

ACTION

Rebalance contractual risk and add schedule contingency.

ENERGY & INFRASTRUCTURE PROJECTS 2

Bring logistics into design and early reviews. Treat the supply chain as a value chain.

ACTION

Build trust across the project network early.

BOTTOM LINE Three groups want risk shared through contracts or earlier collaboration. Maritime & Ports would leave it to the market.

4 AI AND WORKFORCE

Where can AI have the greatest practical impact on your sector, and what workforce capabilities will be needed in the short term and through 2045?

MARITIME & PORTS

Pattern recognition and data consolidation, with experts checking the output.

ACTION

Proceed carefully and keep expert verification.

SUPPLY CHAIN & LOGISTICS

Analytics, tracking and visibility, once the data improves.

ACTION

Fix data quality and train people to assess risk.

ENERGY & INFRASTRUCTURE PROJECTS 1

Only as good as trusted, validated company data.

ACTION

Validate organizational data first.

ENERGY & INFRASTRUCTURE PROJECTS 2

Track and trace now, with routine work automated.

ACTION

Upskill teams and keep specialists in control.

BOTTOM LINE Every group put data quality and human judgment ahead of automation.

WHERE THE GROUPS AGREE

- **Data and expert judgment come before AI.**
- **Uncertainty belongs in routine planning.**
- **A manufacturing announcement is not cargo.**

PART 2 · BREAKBULK AMERICAS SUPER SESSION

BRINGING FUTURE THINKING TO THE COMMUNITY

The day before the regional meeting, 12 Future Thinkers took the conversation to the Breakbulk Live Stage in three 15-minute mini-panels, then opened the floor to the audience.



Leslie Meredith opens the Future Thinkers Super Session on the Breakbulk Live Stage.

MARITIME & PORTS



GEIR-EILIF KALHAGEN
MODERATOR
Texas Department of Transportation



HENRIK HANSEN
AAL Shipping (AAL) Americas



DR. JOHN WILSON
San Jacinto College; Entellect LLC



GREG BOROSSAY
Port of San Diego

SUPPLY CHAIN & LOGISTICS



LORENA ALVAREZ
MODERATOR
Siemens Energy



FRANK GUZMAN
C.H. Robinson



TYLER SULLIVAN
ICAT Logistics



DR. GULSHAN SINGH
University of Houston

ENERGY & INFRASTRUCTURE PROJECTS



LUCAS STROM
MODERATOR
DHL Global Forwarding - Industrial Projects



JEAN-FRANÇOIS BOURQUE
Hatch



MARGARET KIDD
San Jacinto College



THOMAS SKELLINGSTED
LPX Partners

HIGH POINTS FROM THE STAGE

01 Commit capacity early
Henrik Hansen of AAL Shipping told cargo owners to plan around the whole route, not only the ocean leg. “Let us know 6, 12, 18 months in advance,” he said. Greg Borossay of the Port of San Diego recommended an intake review and a pilot before committing to an unfamiliar gateway.

02 Brief the mission, not the shipment
“The shipment is not the mission. It only enables the mission,” said Tyler Sullivan of ICAT Logistics. Providers need to know what the equipment will do and what a delay costs, then have the authority to act on preagreed triggers.

03 Treat logistics as strategy
Frank Guzman of C.H. Robinson said the winners will move logistics decisions upstream. “The losers are gonna be the companies that continue to treat logistics and transportation as some sort of transaction or a procurement event.”

04 Build the data house first
Dr. Gulshan Singh of the University of Houston told companies to organize their operational, financial, HR and permitting data, list the problems AI could solve and start with the top three.

NEW IDEAS FROM THE FLOOR

Why not go faster with AI?
Tim Sensenig, CEO of TMSFIRST.ai, challenged the panels to use AI everywhere they can today. “We’re not laying off people like Oracle. We’re empowering them,” he said. Kalhagen answered that guardrails come first, since too many people believe whatever the tool produces. Lucas Strom of DHL Global Forwarding described checking AI-updated spreadsheets so a wrong date doesn’t become a wrong ETA.

Show people AI is a tool
A question from the floor asked how to reassure new staff that AI will improve their jobs, not replace them, pointing to studies in Finland and Italy that linked automation to job satisfaction. Strom described telling a resistant manager to stop asking for more people with shovels and “go learn how to use that backhoe.”

Plan the routes of the future
Kalhagen described the Texas Department of Transportation combining GIS, demographics and road conditions to plan where routes need to be in the future. “Where do we start making the bridges taller? Where do we start making the bridges wider?” he asked, pointing to 135-meter wind blades.

ONE THING TO FOCUS ON FOR THE NEXT FIVE YEARS

“People. People, focus on your people.”
Lorena Alvarez

“Collaboration and start early.”
Geir-Eilif Kalhagen

“Know your numbers.”
Lucas Strom

BEYOND THE CHOKEPOINT

Mohammad Jaber on the new economics of project logistics

WHY THIS PRESENTATION

Mohammad Jaber, CEO of Combi Lift Projects MEA, works in the middle of the disruption around the Strait of Hormuz. We asked him to bring that firsthand knowledge to Houston and show what it means for U.S. companies and for project cargo worldwide.



Mohammad Jaber presents to Future Thinkers Americas.

Cargo is stranded, freight costs are climbing and schedules are slipping. Combi Lift Projects MEA CEO Mohammad Jaber says conventional risk planning and fixed-price contracts can't absorb disruption on this scale.

Cargo has piled up at alternative ports outside the Strait of Hormuz, and getting it to its final destination is a second problem. Storage is tight, onward transport is limited and shipments already sitting in terminals may have nowhere to go.

"Some cargo I have to ship back to Europe to store it because there is no space," said Mohammad Jaber, CEO of Combi Lift Projects MEA.

The quay capacity available to clear that cargo hasn't changed, which leaves project planners with a hard question: How long will it take to move everything once access improves?

Shippers in the Americas shouldn't treat this as someone else's problem. A vessel held at anchorage loses time promised to its next customer, and those bookings may not hold. A cargo owner in the Americas with nothing headed to the Gulf can still depend on a ship caught in the disruption.

For Jaber, the disruption has exposed weak spots in how industrial projects price logistics risk and write contracts. It also sets up a difficult prospect. Reconstruction and new infrastructure could drive up demand for specialized logistics before today's backlog clears.

Resilience plans were built for known risks

Companies traditionally identify and rate risks, plan mitigation and budget for it, Jaber said. "We think that we are resilient," he said. That approach doesn't account for several shocks landing at once. "I think the uncertainty becomes a norm," he said.

War-risk insurance shows the scale. Jaber said premiums rose from about 0.3% of vessel value to 7.5% to 10% during the regional conflict. At those rates, insuring a transit through Hormuz could cost more than the freight to bring the vessel from China to Abu Dhabi. Some premiums covered only a limited transit window, so a vessel that missed its chance to pass could face another payment.

Avoiding the Red Sea carries its own cost. Rerouting around the Cape of Good Hope adds about 20 to 21 days to a voyage and keeps ships out of the market for their next job. In project cargo, where the specialized fleet is already small, lost vessel time turns directly into delayed projects.

"We have to build again a new infrastructure, a new mechanism, new agreements, alignments and alliances to be resilient again," Jaber said. The starting point is an honest look at exposure: what a company is prepared for, what it expects and what it may not yet know.

FAST FACT

At peak war-risk rates, insuring a transit through the Strait of Hormuz could cost more than the freight from China to Abu Dhabi.

Reopening a route won't restore the schedule

Duqm and Sohar in Oman and Fujairah and Khor Fakkan in the UAE have absorbed much of the redirected cargo, Jaber said, with pressure reaching east to Karachi and ports in India. Those gateways offer access outside the hardest-hit routes, but storage and the equipment needed to move heavy cargo onward are congested. He reported delays of three to four weeks before loading or discharge and cited one critical power project whose cargo had spent eight months in intermediate storage.

The backlog outlasts the threat. The number of vessels waiting can climb quickly, but a port can't add quay space or heavy-transport capacity overnight. Jaber estimated a two- to three-year ramp-up to clear the backlog and restore regional flows. That is his outlook, not a confirmed recovery schedule, but planners who expect capacity to return the day a corridor reopens should take note.

The lump-sum contract is under pressure

Extreme freight and fuel volatility pushed Jaber toward cost-plus arrangements. He

questioned how a logistics contractor can accept fixed pricing when outside events can change the cost of execution.

"I need to change, because if it doesn't change, I'm not willing to sign any more on a lump sum," he said.

He favors open-book arrangements and partnerships over terms written for different conditions. "You want to stick to that paper that's 20 years old," he said of standard terms and conditions. The project owner's response is covered in Supply Chain & Logistics (p. 10).

Reconstruction will compete for the same ships

Projects delayed by the disruption could restart alongside reconstruction and new infrastructure, all drawing on the same transport assets. Dharmendra Gangrade of Larsen & Toubro questioned whether heavy-lift capacity will be available when projects resume, citing substantial increases in delivery costs. Jaber asked whether the industry has enough specialized ships and skilled people for the next phase.

"Who's available can do the job," he said, describing a market where capability may count for more than price.

Jaber cited about $133 billion in announced Gulf infrastructure investment, including port upgrades in Fujairah and Khor Fakkan and proposed rail links across the UAE and between the Red Sea, Arabian Gulf, Indian Ocean and Europe. The goal is route options instead of reliance on a single corridor. Building them will also take project cargo capacity, in competition with reconstruction and work already underway.

The case for local fabrication gets stronger

Fabricating large modules overseas makes sense only if transport stays at a price that protects the business case. Jaber said freight increases have erased much of that advantage. Add insurance and longer transit times, and the lowest manufacturing price may no longer deliver the lowest project cost.

He urged governments and developers to reconsider local fabrication and nearshoring, backed by the workforce and technical expertise to do the work. That doesn't end international project cargo. It changes which components should travel long distances. Because fabrication sites set the routes and the alternatives, logistics belongs in those sourcing decisions.

Competitors need to cooperate

"I'm a forwarder, I need to build a strategic partnership with other forwarders," Jaber said.

He called for long-term relationships across clients, forwarders, carriers and lower-tier subcontractors, with enough trust to solve problems together when circumstances change. Those relationships need to exist before disruption sends companies looking for capacity, data or support from partners they don't know.

> "The survival will be for the fastest in adaptation."
>
> **Mohammad Jaber**
> Combi Lift Projects MEA

"The survival will be for the fastest in adaptation," he said. In practice, that means shortening the time between spotting a constraint and changing the plan.

A three-day job done in an hour

FACT:

Rerouting around the Cape of Good Hope adds about 20 to 21 days to a voyage, according to Jaber.

Jaber sees AI, robotics and automation as one way to offset higher freight, fuel and labor costs. His example came from his own team. He gave a young colleague a task he expected to take about three days. She finished it in an hour using AI.

"That was an eye-opener for me," Jaber said.

The lesson wasn't to drop oversight. It was to define the goal, explain what must not be done and let the employee find the faster method. He urged companies to give new graduates room to contribute ideas and challenge established methods.

"I cannot compete [with a] machine, but I can master how to use it," he said.

He also acknowledged the difficulty of attracting young people into seafaring and transport operations, a gap that will widen if reconstruction and infrastructure raise demand for skilled personnel. The challenge is close to home. His son Zaid, an industrial engineering student who joined the Supply Chain & Logistics table, told him he didn't want to work on a ship.

Jaber expects a long adjustment even if security improves. Companies need to reassess their exposure, invest in alternatives and act before capacity tightens further. "The cost of standing still, no one can afford it," he said.

KEY TAKEAWAYS

- Plan for several shocks at once, not one risk at a time.
- Build recovery time into schedules. A reopened route doesn't clear the backlog.
- Expect reconstruction to compete for heavy-lift ships and skilled crews.
- Test overseas fabrication against the full cost of insurance, freight and transit time.
- Form partnerships, including with competitors, before capacity tightens.

START WITH THE CARGO

Dr. John Wilson brings the Department of Defense mission-based method to cyber risk

WHY THIS PRESENTATION

Dr. John Wilson brings expertise from the Department of Defense and Port Houston. His method was built for ports, but every sector at the table, from shippers to forwarders to EPCs, could be hurt by a cyberattack on the systems that move cargo.



Dr. John Wilson, San Jacinto College and Entellect LLC, walks Future Thinkers through the method.

Most port cyber reviews start with the network. Wilson starts with the cargo move, giving every stakeholder a shared view of what a compromise would do, where workarounds exist and which investments come first.

Port cybersecurity reviews usually begin with networks, devices and software vulnerabilities. Dr. John Wilson proposed a different starting point at Future Thinkers Americas: identify the port operation that must keep running, map every system and handoff it depends on, then determine how a compromise would change its performance.

Wilson, professor of economics at San Jacinto College and public sector strategist at Entellect LLC, adapted a Department of Defense mission-based cyber risk assessment for civilian ports. The Institute for Homeland Security at Sam Houston State University funded the research. The approach ties cyber risk to decisions port leaders already make about throughput, delay, safety, cost and recovery.

Define the operation first

"The Department of Defense is always focused on the mission," Wilson said. "Their systems are aligned to the mission."

Wilson replaces the military mission with a defined port operation. The team sets its boundaries and traces the activities, organizations, decisions and handoffs needed to complete it. Only then does it map the supporting systems, data exchanges and interfaces.

Ports are systems of systems too, but many public and private organizations own different pieces. Without a shared operational map, one system failure can expose dependencies no single stakeholder knew were there.

Follow a 200-ton transformer

Wilson illustrated the method with a 200-ton transformer moving through a port. The thread runs from arrival and lift planning through berthing, discharge, staging, customs clearance and transport preparation to dispatch through the gate. Each step relies on a different mix of systems, from scheduling and crane control to permitting, access control and dispatch.

THE OPERATIONS THREAD FOR A 200-TON TRANSFORMER

1. **Arrival and lift planning**
   scheduling, crane control
2. **Berthing**
   traffic management
3. **Discharge**
   crane control, load monitoring
4. **Staging**
   cargo inventory
5. **Customs clearance**
   release systems
6. **Transport preparation**
   permitting, routing
7. **Gate dispatch**
   access control, dispatch

Illustrative example. Port stakeholders would validate the thread before operational use.

The example is illustrative, and port stakeholders would need to validate it before using it in operations. Its value is in showing the chain. A failure that looks limited to one organization can delay several steps downstream, especially when crews no longer have a workable manual process.

Bad data can do more damage than downtime

The assessment looks at three properties. A confidentiality breach can expose cargo information or operating plans. An integrity loss can alter the data used for cargo location, lift decisions or release. An availability loss cuts off the systems and data needed to operate.

Wilson flagged integrity as potentially the most damaging, because small changes can

lead to wrong decisions before anyone notices the compromise.

“If somebody just starts making minor modifications to your data, it could cause you to slow down port operations,” he said.

Subject matter experts can start with a qualitative review of the likely effect, available workaround and recovery needs. Where validated local data and calibrated models exist, the method can estimate changes in throughput, delay, cost, capacity and recovery time. The research proposes that capability. It does not present a completed simulation for Port Houston.

Competitors need a shared view

A port isn’t a military command. Terminal operators, carriers, cargo owners, government agencies, marine service providers and inland transport companies each control their own systems while depending on one another to finish the same job. Some of them compete. Cyber resilience still requires them to agree on what they share.

“The problem here is primarily stakeholder engagement and getting all the stakeholders to agree what the problem is,” Wilson said.

> “The problem here is primarily stakeholder engagement and getting all the stakeholders to agree what the problem is.
>
> **Dr. John Wilson**
> San Jacinto College

A federated systems repository is one way forward. Participants share the dependencies and interfaces that affect the joint operation, and each organization keeps sensitive internal details to itself.

The operational framing also helps executives decide where to spend. Penetration tests show where an attacker might get in. Leaders also need to know what the compromise would do to cargo flow, vessel movements and recovery. “If you talk operationally, now all of a sudden you’ve gotten their attention,” Wilson said.

KEY TAKEAWAYS

- Start cyber reviews with a cargo operation, not the network.
- Watch data integrity. Small changes can drive wrong decisions unnoticed.
- Share dependencies across the port community without exposing sensitive systems.
- Present cyber risk in operational terms to win executive support.



Future Thinkers listen as each work group reports.

10 WAYS TO PLAN FOR THE INDUSTRY'S FUTURE



Dharmendra Gangrade, Larsen & Toubro, and Lucas Strom, DHL Global Forwarding.

01
Plan capacity around funded projects.
Equipment orders and construction schedules are better guides than headline investment.

02
Bring logistics into equipment design.
Test transport requirements while dimensions, weights and delivery plans can still change.

03
Ask why the cargo is moving.
Knowing the purpose, end use and timing lets a provider work back to the risks.

04
Protect schedule contingency at the top.
If it is gone at the owner and EPC level, suppliers down the chain have no room to absorb disruption.

05
Build recovery time into schedules.
A reopened route won't clear the backlog or bring ships back right away.

06
Write contracts for disruption.
Settle cost treatment and decision rights at tender, before the next shock.

07
Form partnerships before capacity tightens.
Include competitors when no single provider can secure the route.

08
Map operations to find cyber risk.
Trace one critical cargo move and test what happens when a system fails.

09
Fix the data before scaling AI.
Validate organizational data and keep experts reviewing the output.

10
Keep fleets and plans flexible.
Expect chokepoints to stay open but with access that depends on flag, ownership and alignment.

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Building Insights to Plan for 2045

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