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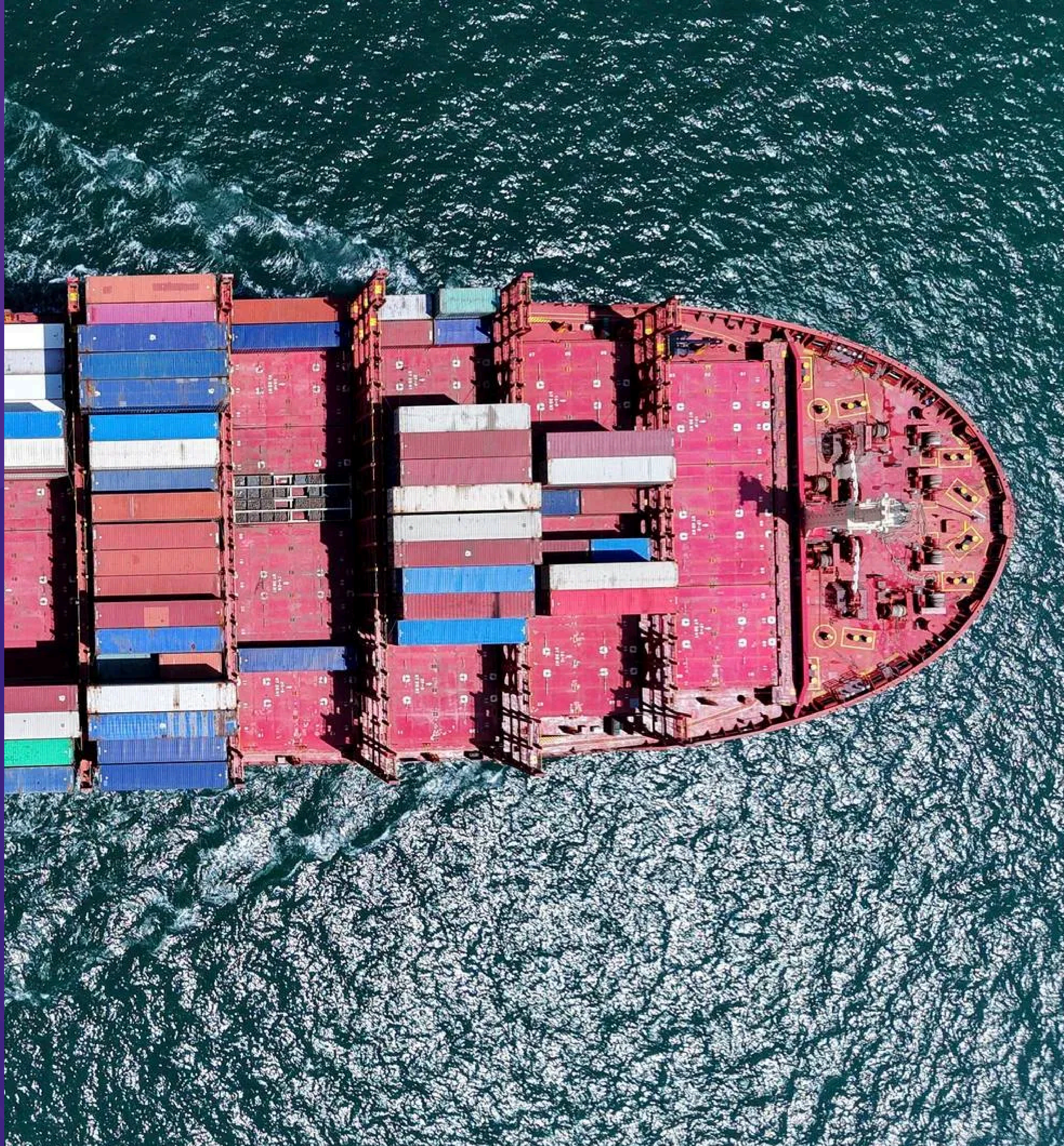
Market Research and Strategy Plan

Mississippi River Waterway Expansion



Project Mentor: Nick Aristov

Prepared By: Siyu(Cindy) Hou, Zixuan(Karl) Jin, Kaiying(Kerdy) Wang

Executive Summary

- Brief context of problem statement and two ports under consideration
- Travel Time Estimate
- Cost Estimation
- Potential Business Opportunity and Future Demand Forecast

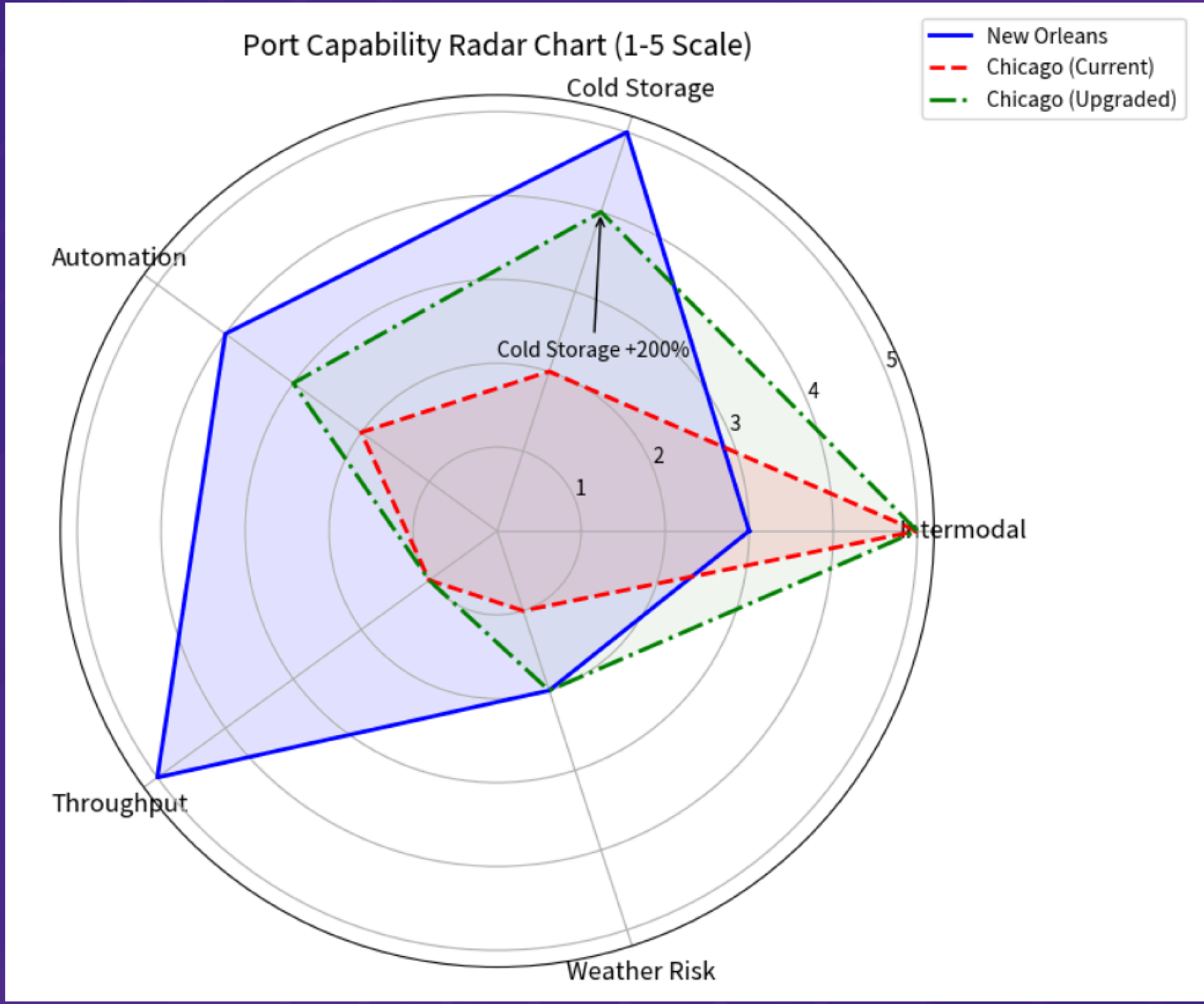
Problem Statement

The current reliance on trucking for freight transportation between New Orleans and Chicago leads to significant challenges, including severe congestion, environmental pollution, load weight restrictions, and high transportation costs. The estimated lead time for this route via barge now is 21 days, with an average cost of $2,100. DP World is exploring the feasibility of a waterway-dominant transportation mode to reduce lead time to 7 days while maintaining competitive costs.

Port Infrastructure Assessment

Metrics	New Orleans	Chicago
Capacity	1M TEU/year	50,000 TEU/year
Loading Speed	20-30 TEU/h 50 TEU/h (per crane)	15-20 TEU/h 30 TEU/h (per crane)
Key strength	Mississippi River gateway	Multimodal hub
Major Bottleneck	Hurricane outages (7+ days/yr)	Winter ice (Dec-Feb)

Port Infrastructure Assessment



Upgrade Roadmaps & Strategic Focus

New Orleans:

Louisiana Int'l Terminal (2025-2028)

- +1M TEU capacity
- 30% faster loading (automation)
- *Impact*: Reduces dwell time from 2.5 → 1.8 days

Chicago:

Calumet Modernization (2024-2026)

- +400 refrigerated plugs
- 3-story barge clearance
- *Impact*: Winter throughput ↑ 40%

Lock & Dam System Analysis

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Overview of Mississippi River lock & dam system

- Lower Mississippi River: **0** locks and dams
- Upper Mississippi River: **2** locks and dams
- Chicago: switch to the Illinois Waterway at the Mississippi, going through **8** locks and dams

Delays, maintenance issues, capacity limits

- Average Delay: Typically **1–3 hours**, though commercial peak times may exceed this
- Processing Time: ~**0.2–0.3** hours (~12–18 minutes)
- Combined, this aligns with prior estimates: ~**2.25–3.25** hours per lock.
- Overall ~**22.5–32.5** hours to pass all lock and dams along the way

Weight Limit & Climate Risk Assessment

Historical Draft Limit and Barge Capacity:

Draft Limits:
9–12 ft
Barge Capacity:
1,100–1,750 t
per Barge
16,500–20,250 t
Tow(normally 15 barges)

Risk zones and seasonal limitations

Segment	Drought (Low-Water)	Freeze (Ice)	Flood (High-Water)
Lower Mississippi (NOLA→Memphis)	~3-4 in 10 years, more extreme	Rare to none	~1 in 3–4 years
Upper Mississippi (StL→Grafton)	~1-3 in 10 years	Typically won't affect water transit	~1 in 5–10 years
Illinois Waterway (Grafton→Chicago)	Typically won't affect water transit	never or 2-3 weeks	Typically won't affect water transit

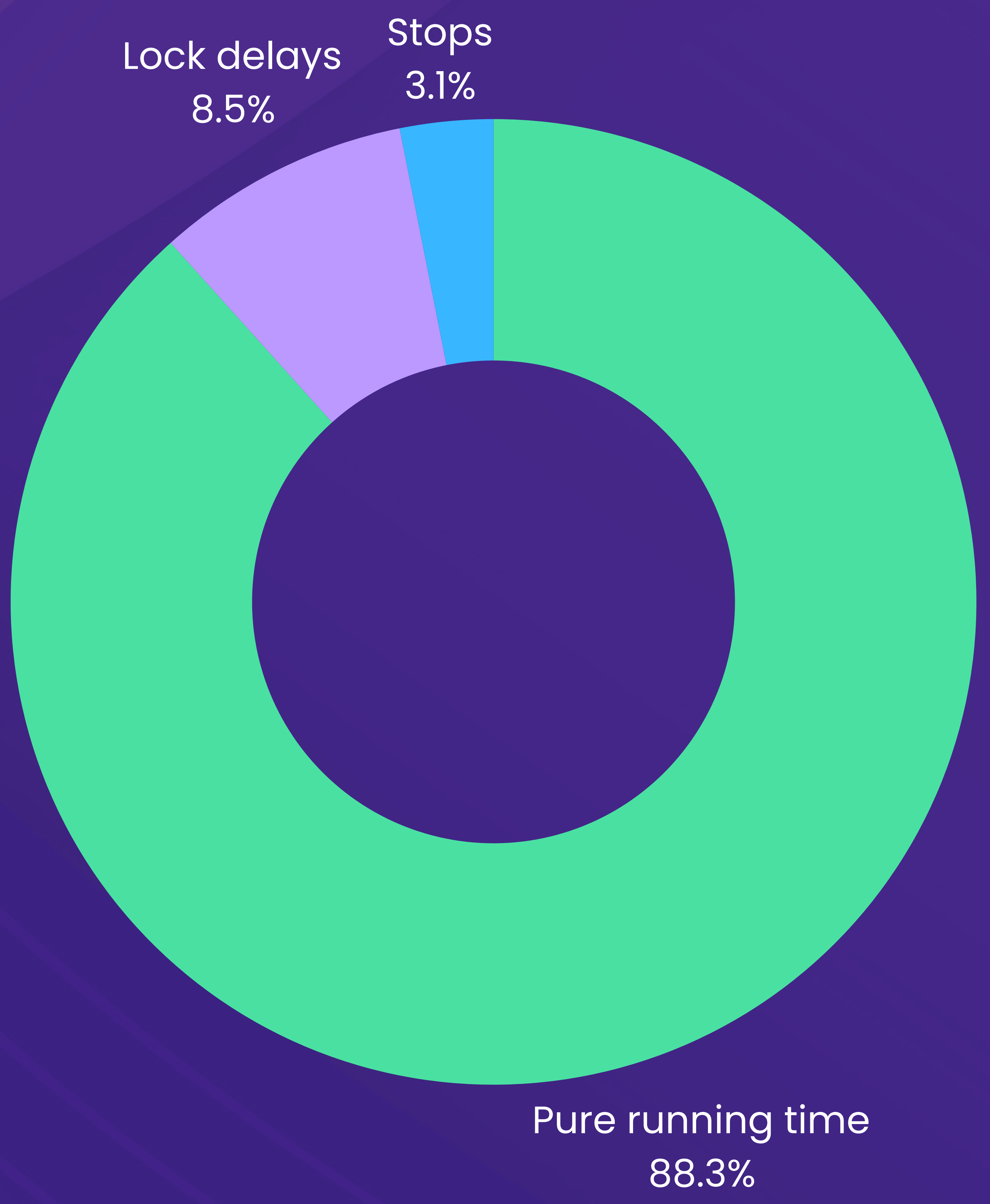
Affecting time period and Alternative Strategy

Event	Season	Intermodal Alternatives
Drought (Low Water)	Late Winter (Dec-Jan), Late summer–late fall (Aug–Nov)	Rail, Truck, Barge-rail hybrid, Barge-truck hybrid
Freeze/Ice	Dec–Feb: it depends on the severity of the winter	The same as above
Flood/High Water	Jan–May	The same as above

Travel Time Estimation

We estimated travel time by combining segment distances with average tow speeds adjusted for river current. We considered seasonal flow, draft limits, lock delays, crew and fuel stops.

Direction	High-water	Normal	Low-water (draft-limited)
New Orleans → Chicago (up-river)	15.0 – 15.4 days	13.2 – 13.6 days	12.1 – 12.6 days
Chicago → New Orleans (down-river)	9.1 – 9.6 days	10.0 – 10.4 days	10.8 – 11.2 days



Share of total travel time – Normal-season, up-river (≈13.4 days)

Cost Breakdown

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Cost List

Transport Mode	Distance (miles)	Rate ($/ton-mile)	Total Cost ($)
Truck	925	$0.11	2035
Rail	950	$0.05	950
Barge	1100	$0.02	440

Try Hybrid?

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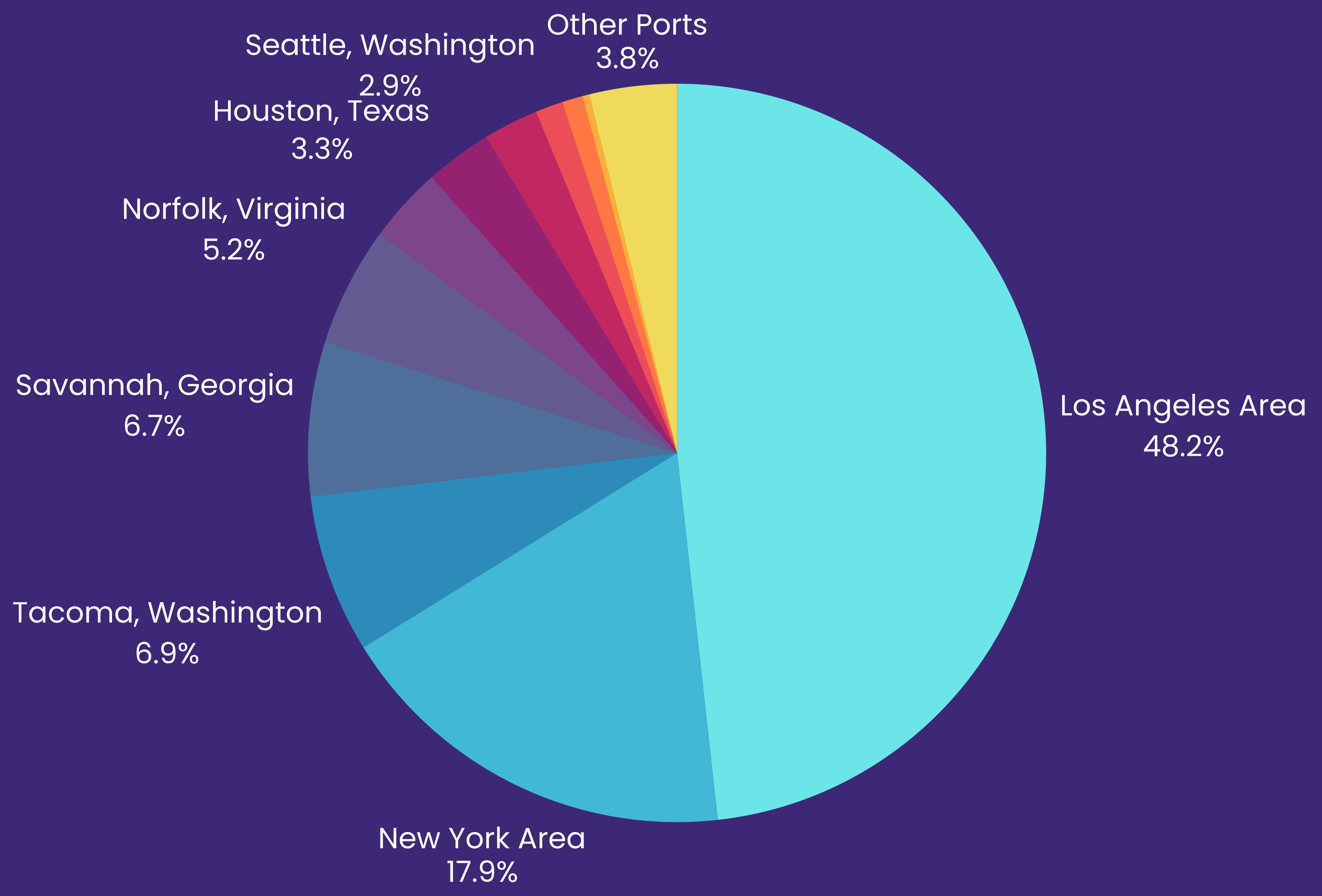
Transport Option	Segments	Segment 1 Mode	Segment 1 Distance (mi)	Segment 1 Rate ($/ton-mile)	Segment 1 Cost ($)	Segment 2 Mode	Segment 2 Distance (mi)	Segment 2 Rate ($/ton-mile)	Segment 2 Cost ($)	Total Cost ($)	Use Case
Barge + Rail	**Barge: NO →** St. Louis (800 mi), **Rail: St. Louis →** Chicago (300 mi)	Barge	800	0.02	320	Rail	300	0.05	300	620	Best for large-volume cargo; low cost and moderate speed. Requires rail access in Chicago
Barge + Truck	**Barge: NO →** Joliet, IL (1000 mi), **Truck: Joliet →** Chicago (50 mi)	Barge	1000	0.02	400	Truck	50	0.11	110	510	Ideal for warehouse delivery in Chicago suburbs. Flexible last-mile trucking
Truck + Barge	**Truck: NO →** Memphis (300 mi), **Barge: Memphis →** Chicago (850 mi)	Truck	300	0.11	660	Barge	850	0.02	340	1000	Useful if cargo originates outside NO city or port is congested. More complex coordination

Possibility of transferring goods from other ports to NO

USPort	OrderCount
Los Angeles Area/ Oakland, California	113865
New York/ New Jersey Area	42290
Tacoma, Washington	16468
Savannah, Georgia	15986
Norfolk, Virginia	12401
Houston, Texas	7932
Seattle, Washington	7015
Philadelphia, Pennsylvania	5769
Charleston, South Carolina	4637
Baltimore, Maryland	1817
New Orleans, Louisiana	**548**



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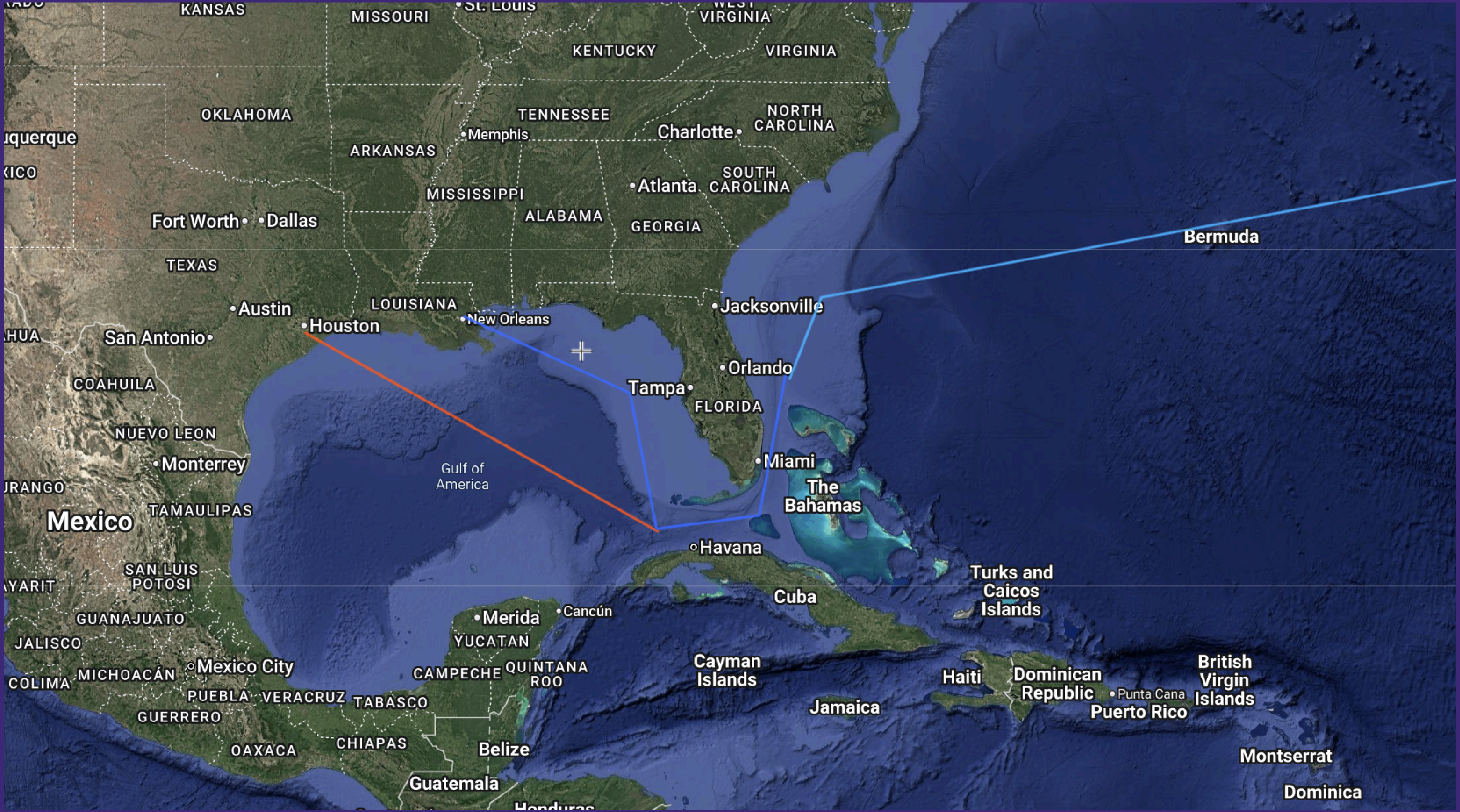
What are the potential convertible targets in other foreign ports - US ports routes?

Most ports to Houston：



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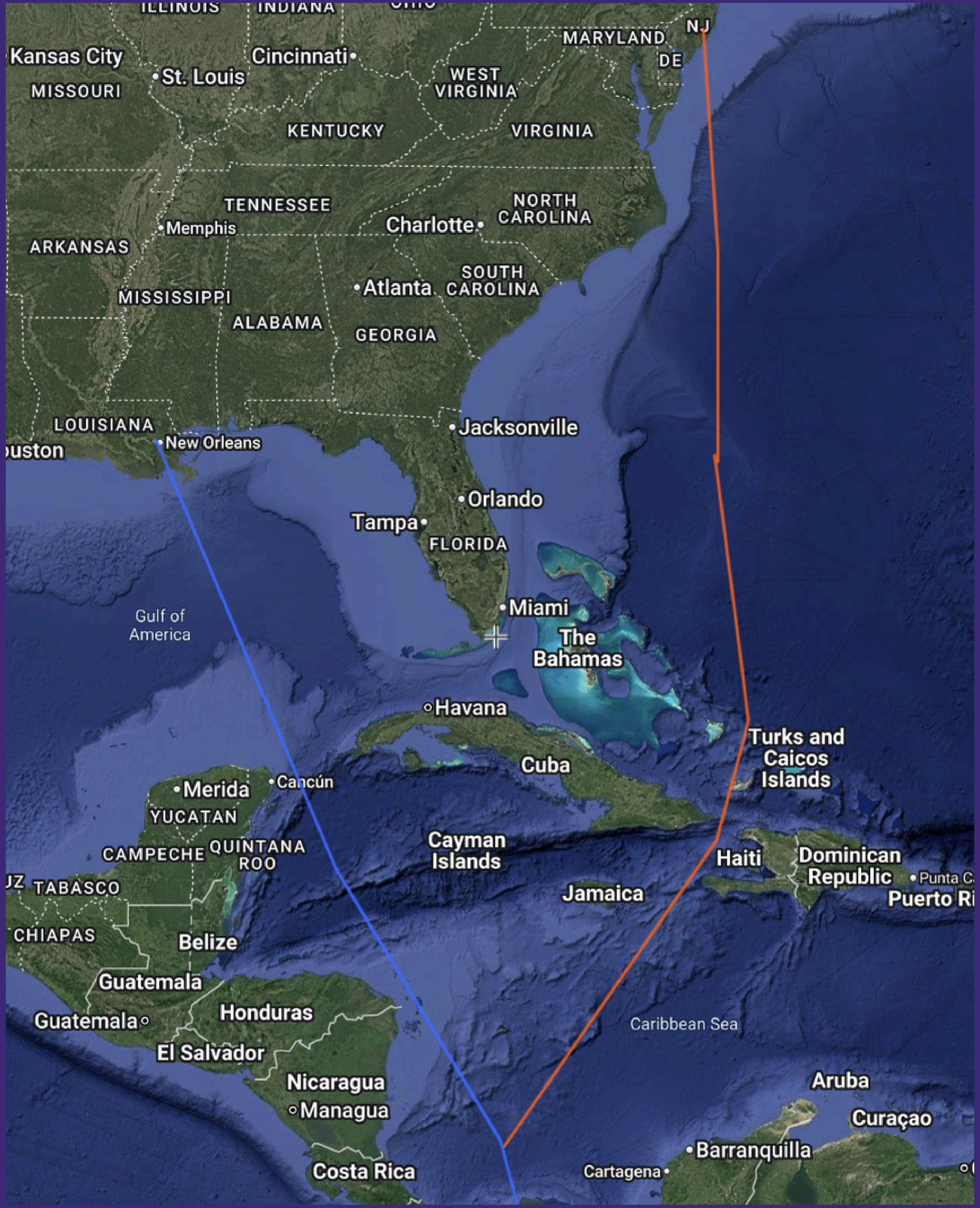
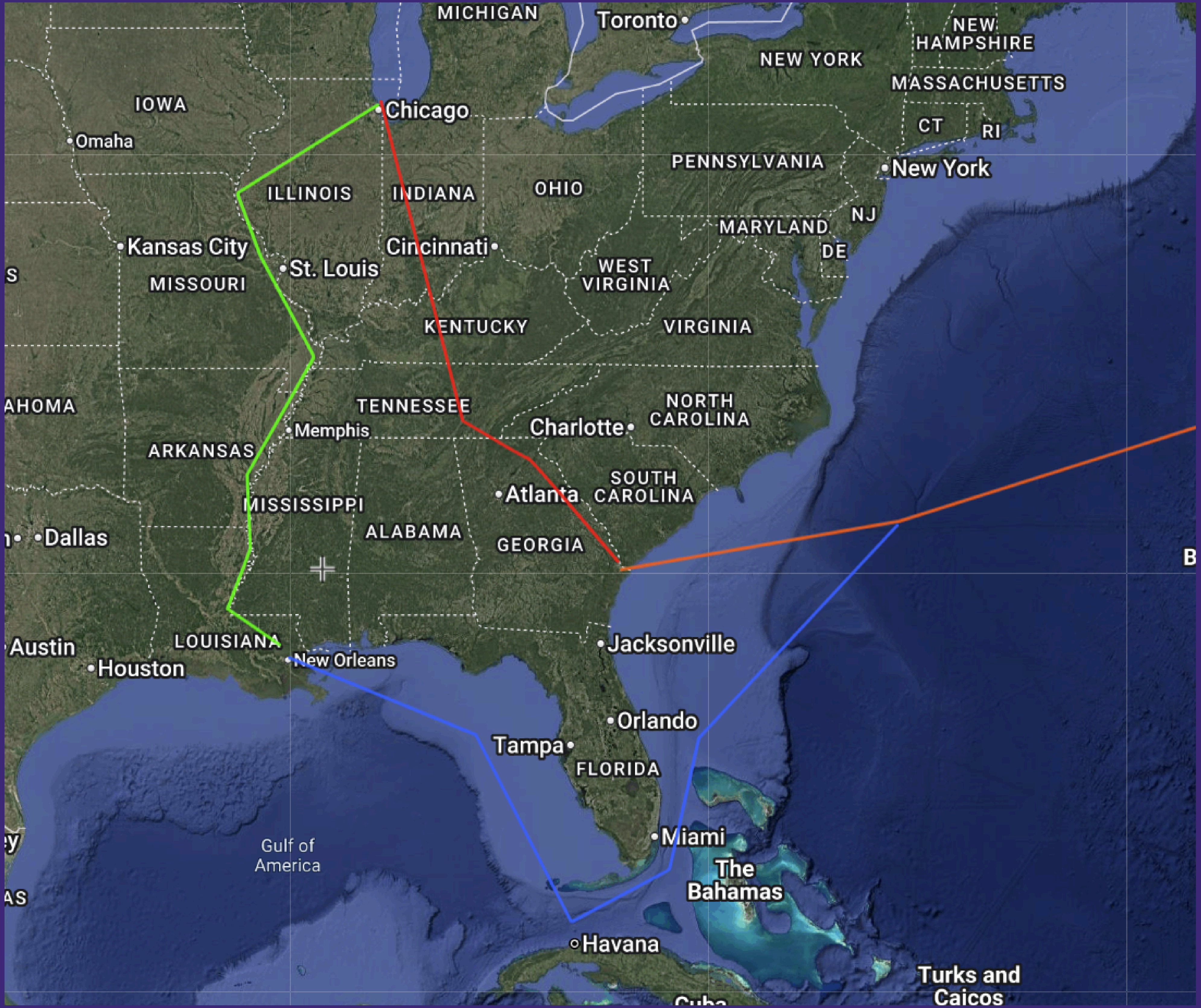
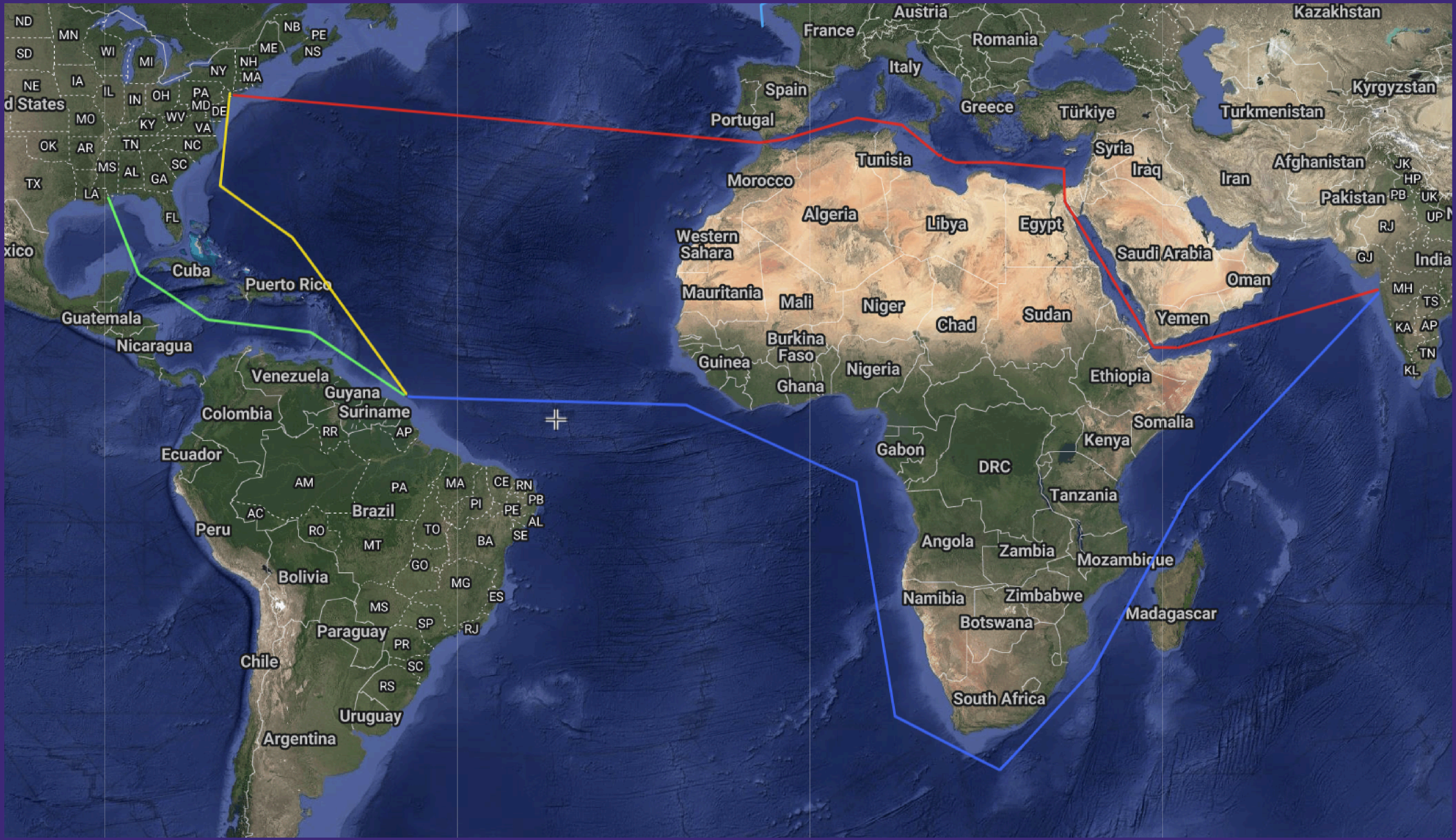
Central America/Australia to Philadelphia:

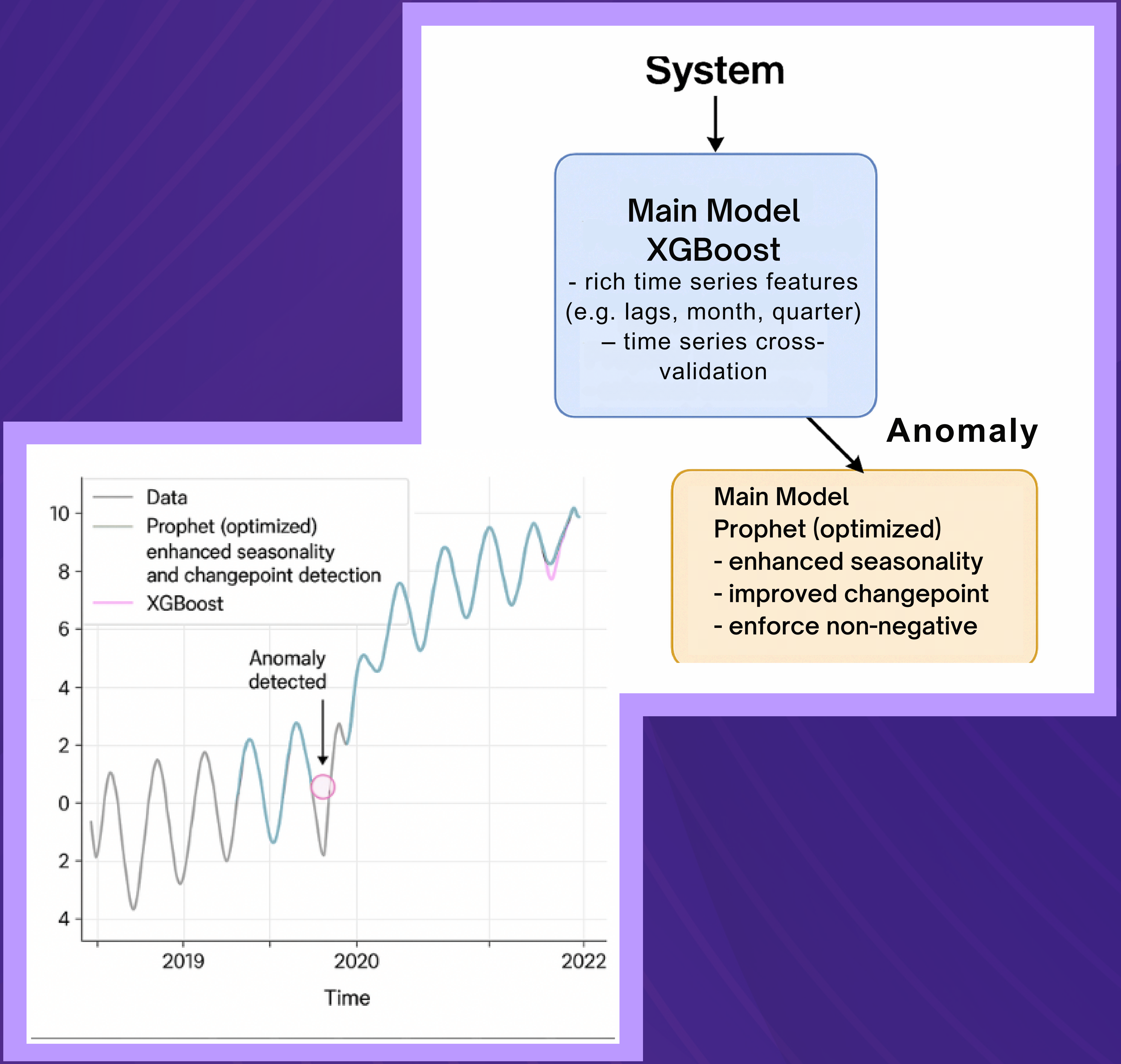


European ports to Savannah :



India to New York



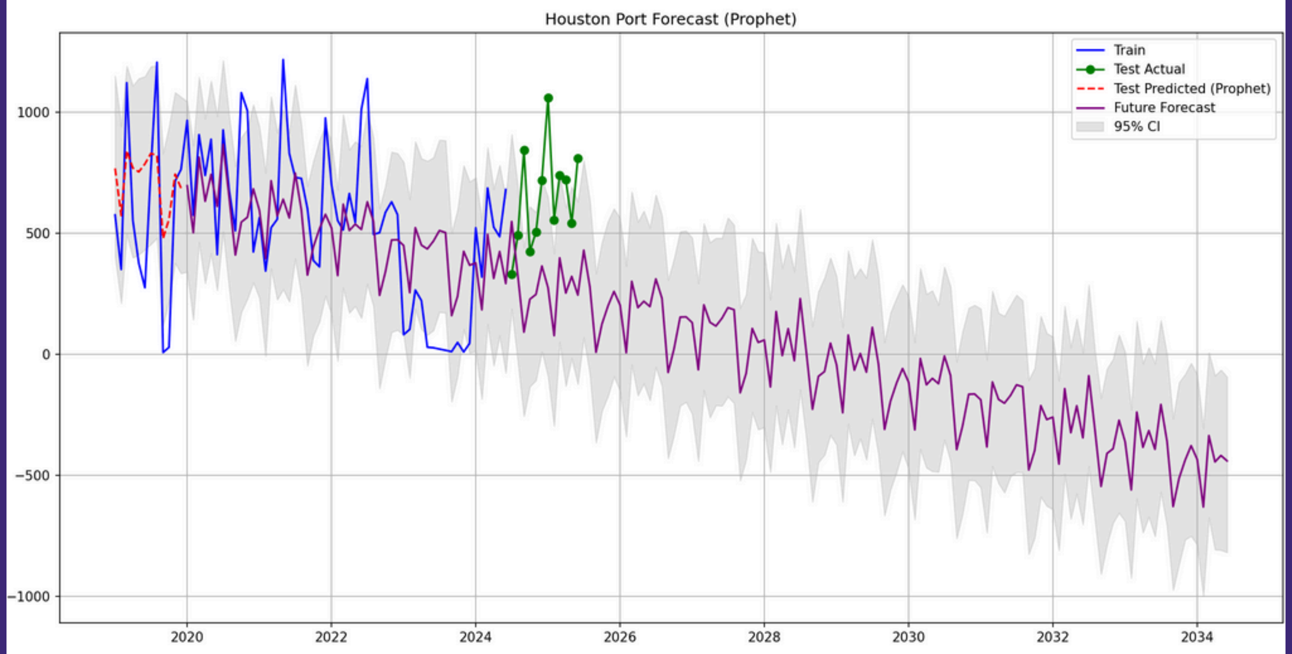


Predictive Model: Future Demand & Market Size

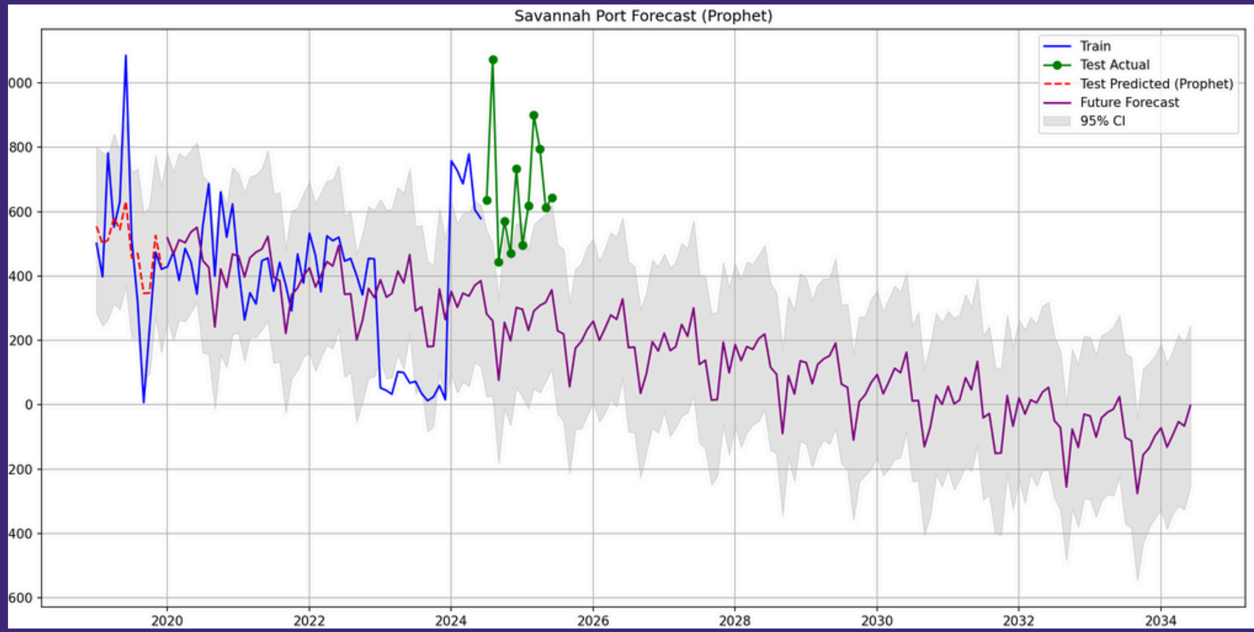
- Model types: XGBoost, and prophet as backup
- Input variables: USPort, Quantity
- Demand forecasts for next 5–10 years
- Market capture potential for waterway transportation

Future Demand Forecasting

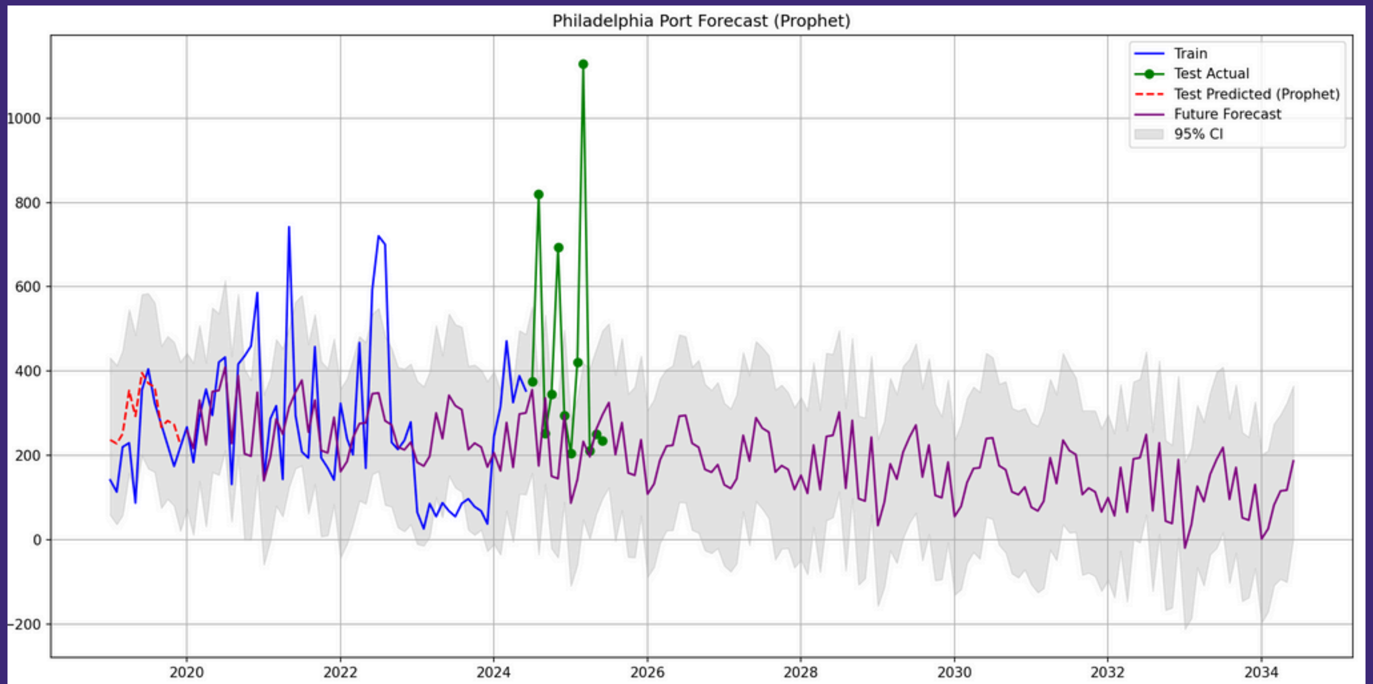
Houston



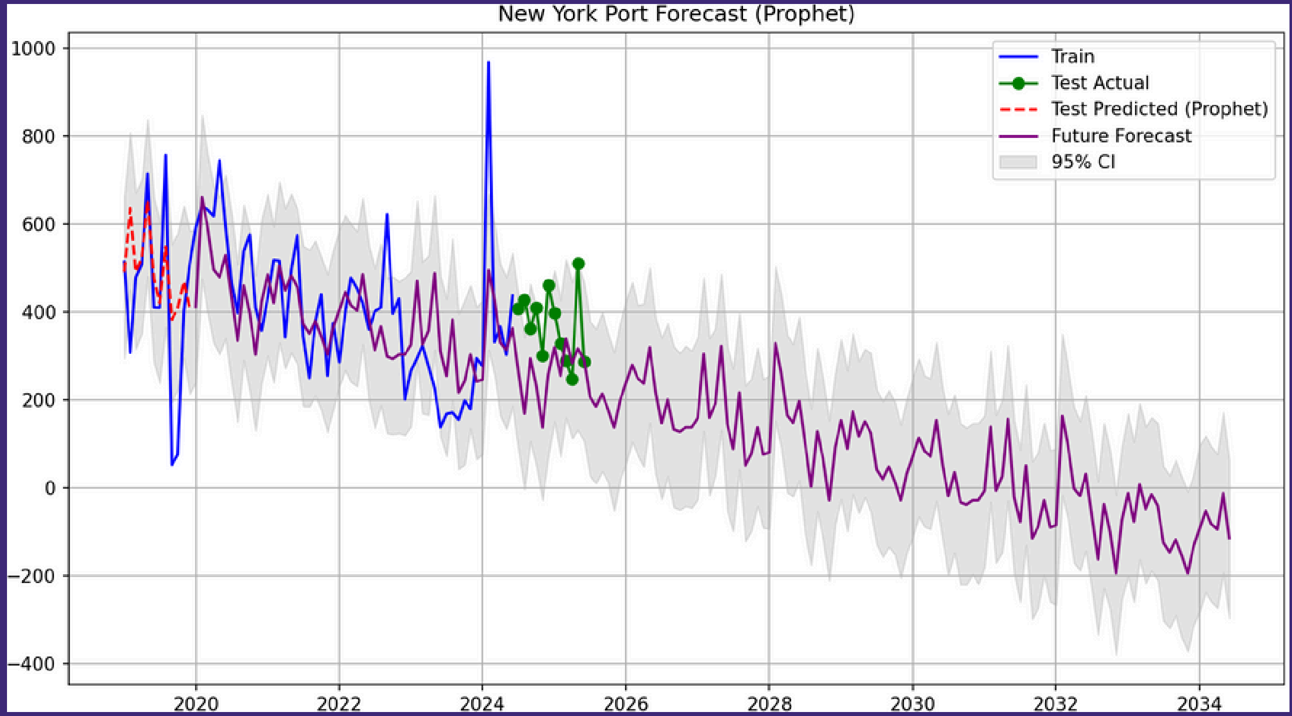
Savannah



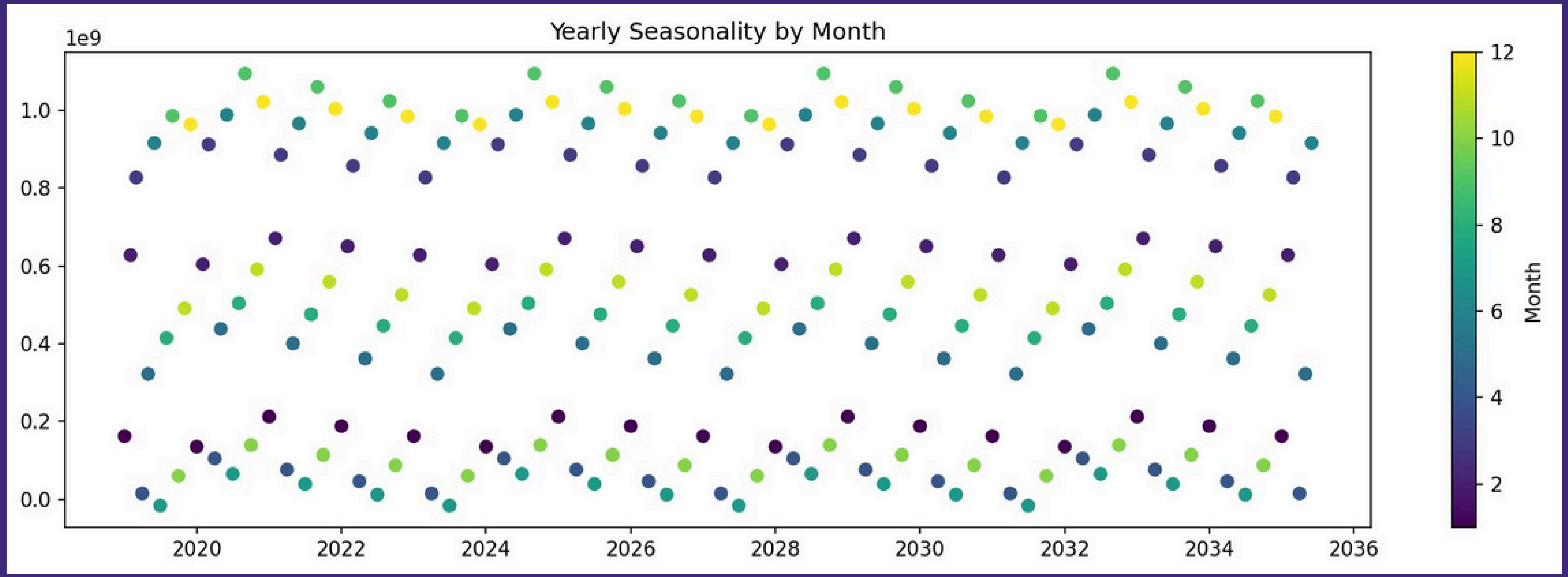
Philadelphia

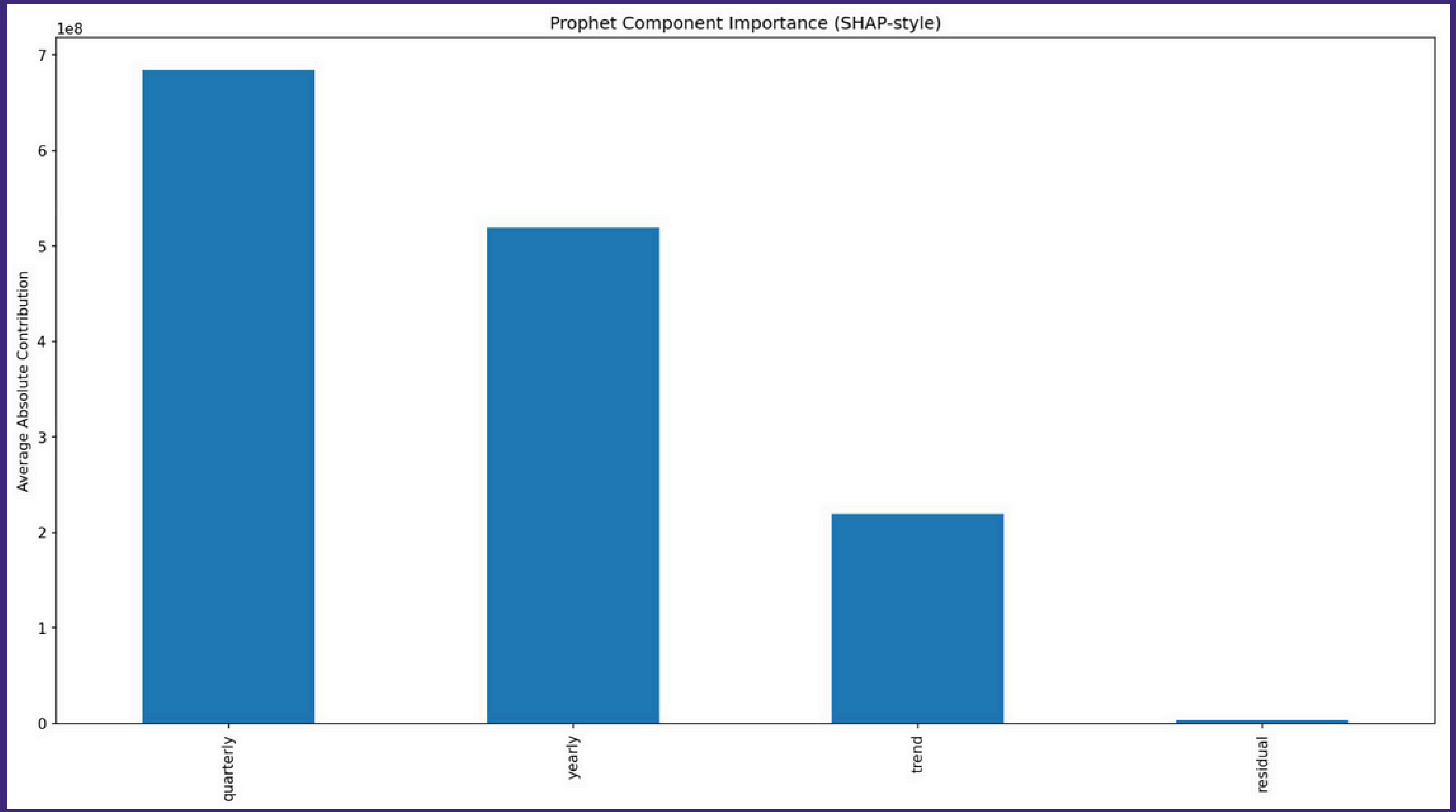


New York(import from India)



Seasonality Analysis





the order volume peaks in June-August

the annual seasonality dominates

Strategy for Reducing Empty Backhaul from Chicago to New Orleans

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Explore Alternative Commodities

Construction materials, Agricultural inputs & outputs (fertilizer, grains to Central America)

Optimize Load Consolidation

Engage 3PL & freight forwarder to identify latent southbound freight needs they may already service by truck or rail.

Provide Pricing Incentives

Incentivize cargo owners to switch to barge by passing on the cost savings from otherwise-empty repositioning trips.

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Strategic Recommendations

Time

- L&Ds, Stops, Boat Speed
- Climate Factors
- Multimodal Alternatives/Fleet Upgrade to further shorten travel time

Cost

- Waterway cost least
- Houston
- Panama Route
- Europe to Savannah
- India / South Asia (Cape of Good Hope route)

Respond to environmental protection

- lower carbon emissions
- Protecting companies from huge carbon taxes

Appendix A: Seasonal hydraulics & draft constraints on boat speed

Season (typ.)	Lower/Middle Miss. net current*	Effect on speed & tow size
High-water (Mar–May)	-2 mph down / +2 mph up (extra push coming at you when north-bound)	Up-river slows ~0.7 mph; down-river gains ~0.9 mph
“Normal” pool (Jun & Oct-Nov)	≈ -1 mph / +1 mph	Baseline we used earlier
Low-water / drought (Aug–Sep)	-0.5 mph / +0.5 mph	Up-river actually speeds up ~0.5 mph (less adverse current) but you must light-load → fewer tons/barge

Reach	“Typical” tow speed through the water*	Net current (avg)	Over-ground speed (up-river)	Over-ground speed (down-river)
Lower & Middle Mississippi	6.2 mph	≈ ± 1.1 mph	≈ 5.1 mph	≈ 7.3 mph
Illinois Waterway	5.0 mph	≈ ± 0.5 mph	≈ 4.5 mph	≈ 5.5 mph

Field studies show ~5.3 mph up vs 8.8 mph down in ordinary flows, which brackets these adjustments nicely. Segment speeds come from measured tow averages (5.0-5.3 mph up-bound, 7–8 mph down-bound) on the Lower Miss. and Illinois Rivers , then shifted ± 0.5-0.9 mph for seasonal flow using USACE current guidance

Thank You!

Contact Us:

Siyu(Cindy) Hou:
cindyh01@mit.edu
siyuhou1001@gmail.com
Zixuan(Karl) Jin:
jinz0401@mit.edu
nekodake0401@hotmail.com
Kaiying(Kerdy) Wang:
wang917@mit.edu
1953802051@qq.com

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