PIONEERING BLOCKCHAIN

TEAM D1

MIKE GUEVARRA   VALERIE CHAN
TED CHAN   ROY CHAPMAN

THE NORTHWEST SEAPORT ALLIANCE

AGENDA

OVERVIEW

ANALYSIS

SOLUTION

RISKS & MITIGATION

IMPACT

Q & A

1 Perform a SWOT analysis on TradeLens

2 Describe the Motivations of IBM and Maersk

3 Recommend which option NWSA should choose
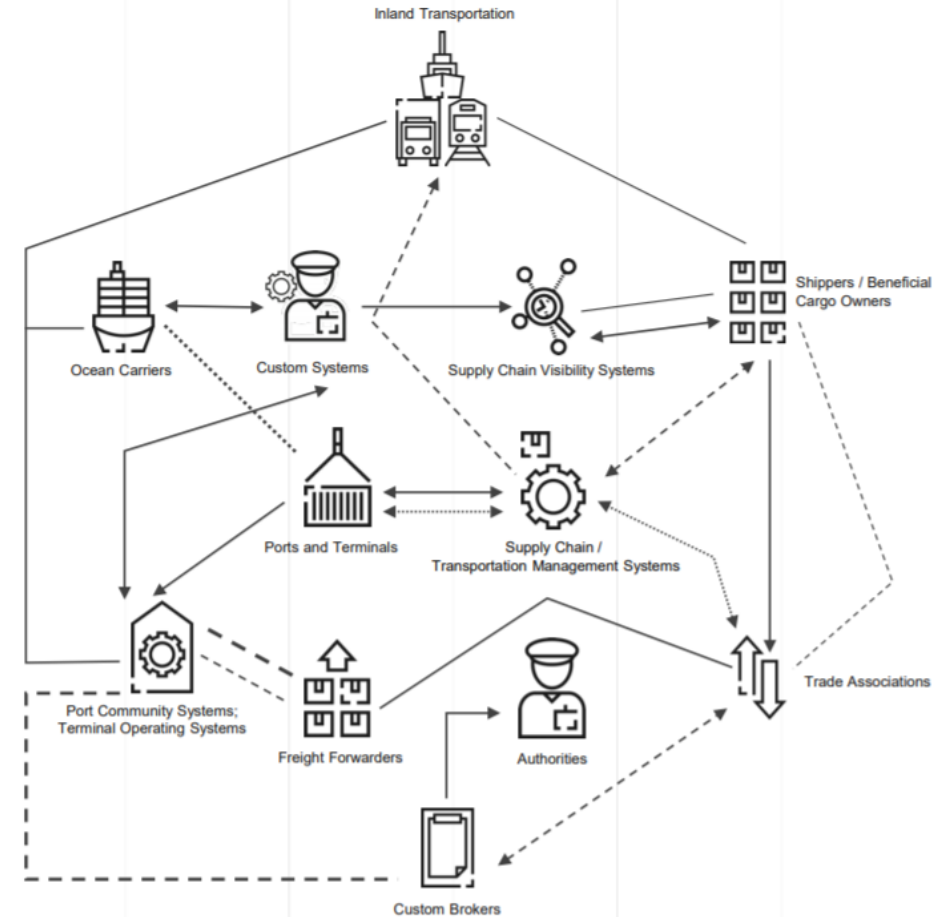
TradeLens (Maersk / IBM)   Competitor Solution   Do Nothing For Now

TRADITIONAL METHODS

- ⦿ **Low Transparency**

- ⦿ **Poor Security**

- ⦿ **Inefficient**

BEFORE BC

BLOCKCHAIN

DECENTRALIZED DIGITAL LEDGER

- **Increase Transparency**
- **Improve Security**
- **Boost Efficiency**

BEFORE BC

AFTER BC

THE PLATFORM IS BUILT ON AN OPEN TECHNOLOGY STACK AND IS UNDERPINNED BY BLOCKCHAIN TECHNOLOGY

PORT AUTHORITY =/= PORT OPERATOR

"NWSA is a port authority. We are basically landlords that lease out land to port operators (tenants)"

Dustin Stoker, COO NWSA

As a port authority, NWSA values healthy tenants and has the obligation to boost Washington economy

THE NORTHWEST SEAPORT ALLIANCE

PORT AUTHORITY =/= PORT OPERATOR

"NWSA is a port authority. We are basically landlords that lease out land to port operators (tenants)"

NWSA'S GOALS & OBLIGATIONS

1) Ensure our tenants are financially healthy
2) Boost Washington Economy

Dustin Stoker, COO NWAS

PORT AUTHORITY =/= PORT OPERATOR

"NWSA is a port authority. We are basically landlords that lease out land to port operators (tenants)"

NWSA'S GOALS & OBLIGATIONS

1) Ensure our tenants are financially healthy
2) Boost Washington Economy

Dustin Stoker, COO NWAS

PAIN-POINT

"Tenants are using their own proprietary systems that **does not communicate with each other. There is room** for improvement"

A Decision matrix demonstrates which digital platform options are the most favorable

THE NORTHWEST
SEAPORT ALLIANCE

Favorable, +1

Neutral, 0

Unfavorable, -1

	TradeLens	CargoSmart	APL Accenture	Wait & Observe
Benefits				
Availability				
Adoption				
Geo. Partners				
Services				
Total Points				

A Decision matrix demonstrates which digital platform options are the most favorable

THE NORTHWEST SEAPORT ALLIANCE

- ■ Favorable, +1
- ■ Neutral, 0
- ■ Unfavorable, -1

	TradeLens	CargoSmart	APL Accenture	Wait & Observe
Benefits	+1	+1	+1	-1
Availability	+1	+1	-1	+1
Adoption	+1	+1	0	-1
Geo. Partners	0	+1	0	0
Services	0	+1	0	0
Total Points	**3**	**5**	**0**	**-1**

PLATFORM OPTIONS

■ Favorable, +1

□ Neutral, 0

■ Unfavorable, -1

	TradeLens	CargoSmart	APL Accenture	Wait & Observe
Benefits	+1	+1	+1	-1
Availability	+1	+1	-1	+1
Adoption	+1	+1	0	-1
Geo. Partners	0	+1	0	0
Services	0	+1	0	0
Total Points	3	5	0	-1

Key Takeaway: Tradelens and CargoSmart are the most relevant market solutions for NWSA.

BACKGROUND

MOTIVATIONS

PROGRESS

Joint Collaboration

TradeLens has a purpose to be an open and neutral blockchain platform for the shipping industry

THE NORTHWEST
SEAPORT ALLIANCE
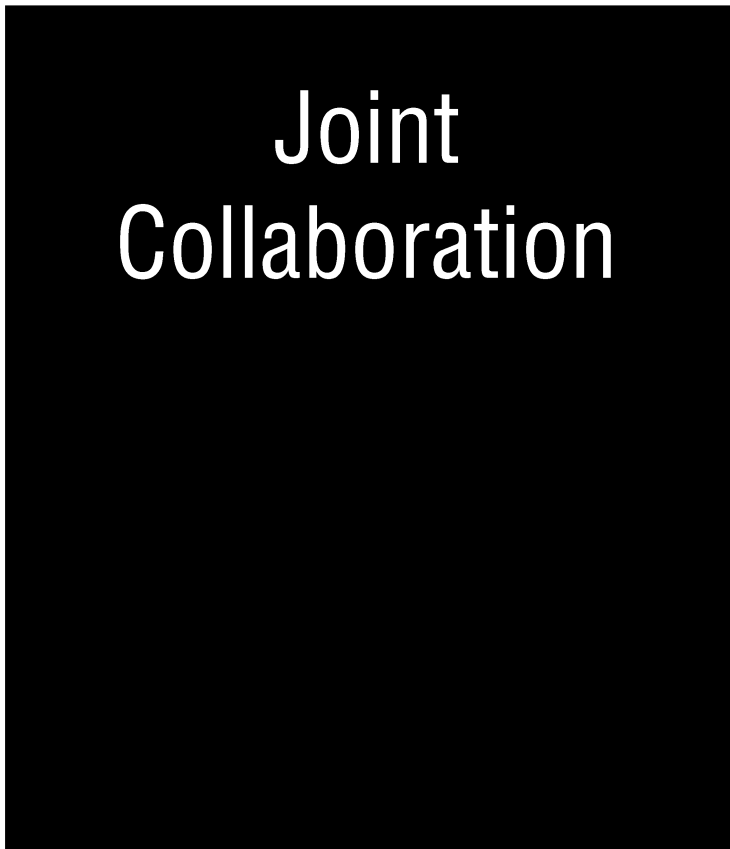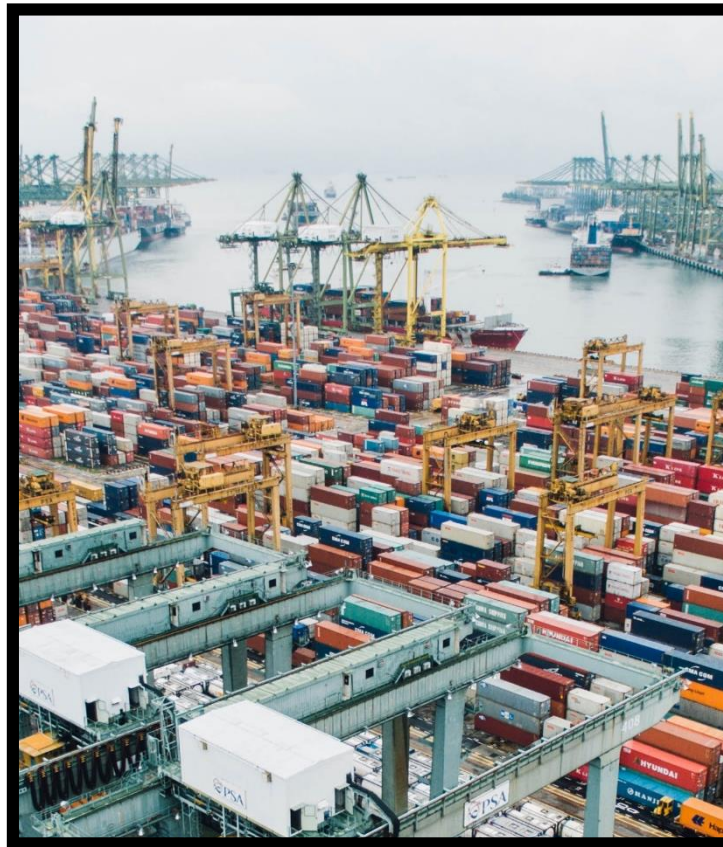
BACKGROUND
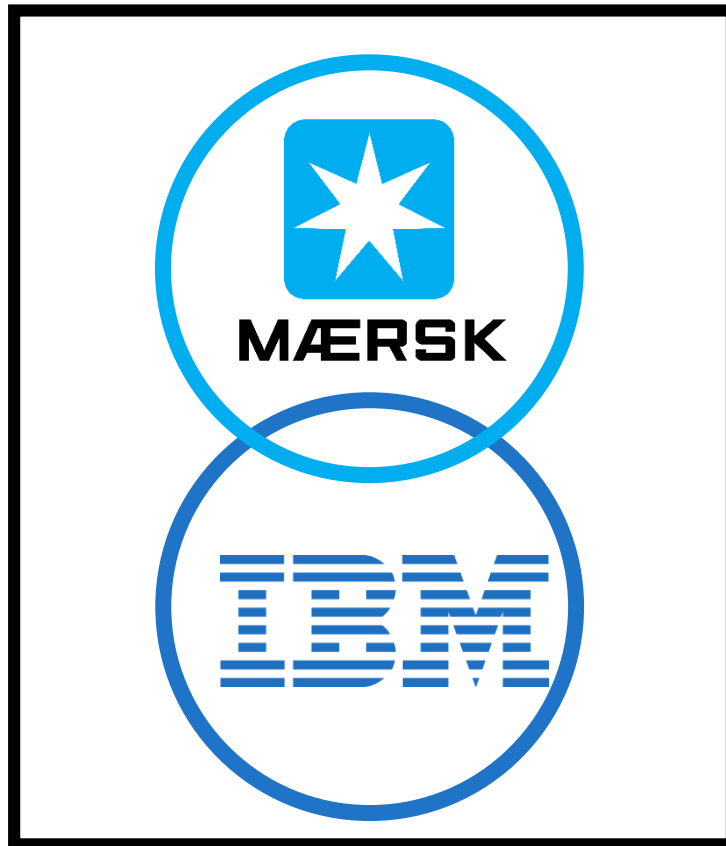
MOTIVATIONS

PROGRESS

Transform Industry

First Mover Advantage

Future Cash Flows

TradeLens has a purpose to be an open and neutral blockchain platform for the shipping industry

THE NORTHWEST
SEAPORT ALLIANCE

BACKGROUND

MOTIVATIONS

PROGRESS

MAERSK

IBM
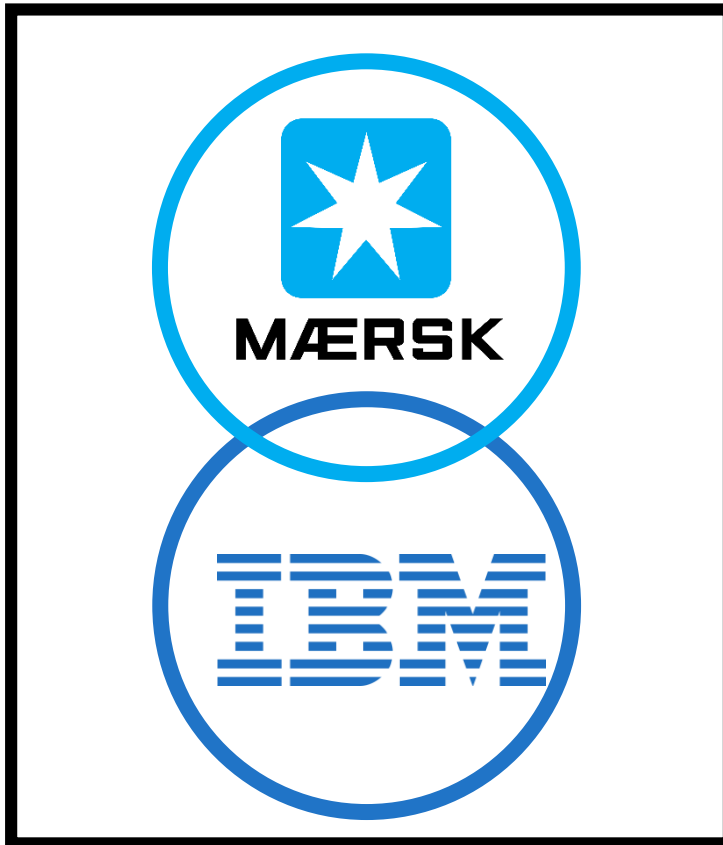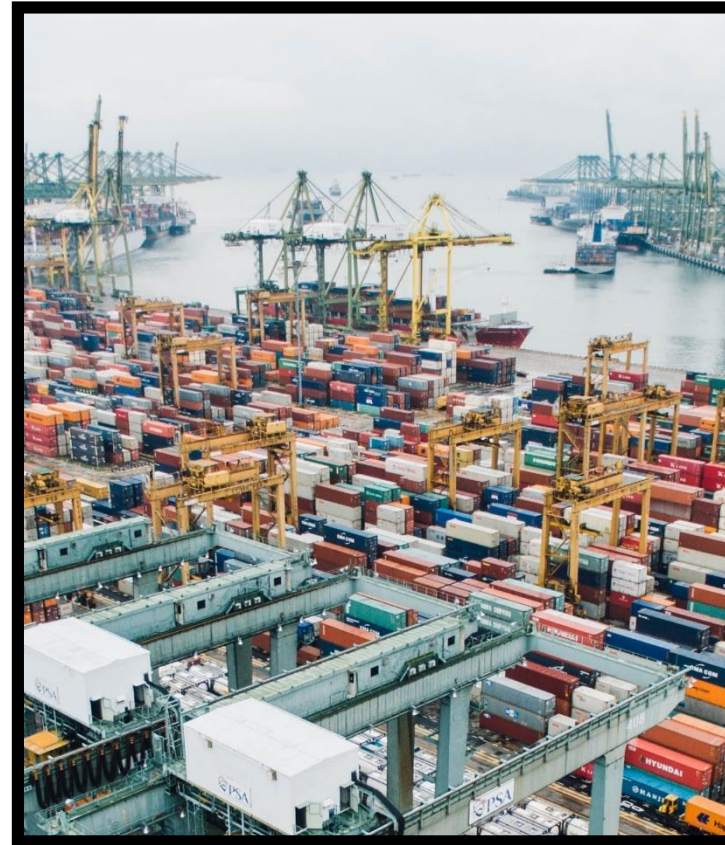
AUG '18 Release

90 Ports

3 Carriers

5 Governments

TRADELENS SWOT

S — STRENGTHS

- Expertise in Freighting & tech
- Strong Internal Financial Backing
- Momentum & Traction at Launch
- **First Mover Advantage**

W — WEAKNESSES

- **Independence Issues from Carrier Competitors**
- High Resistance on Carrier Adoption
- Proprietary IP Gives Users No Rights

O — OPPORTUNITIES

- Push for Wide Adoption with Multiple Stakeholders
- Increase World GDP
- **Rapid Innovation of New Services**

T — THREATS

- **Rejection from Carriers Jeopardize Value of Platform**
- Cyber & Data Security Breaches
- Rising Competition
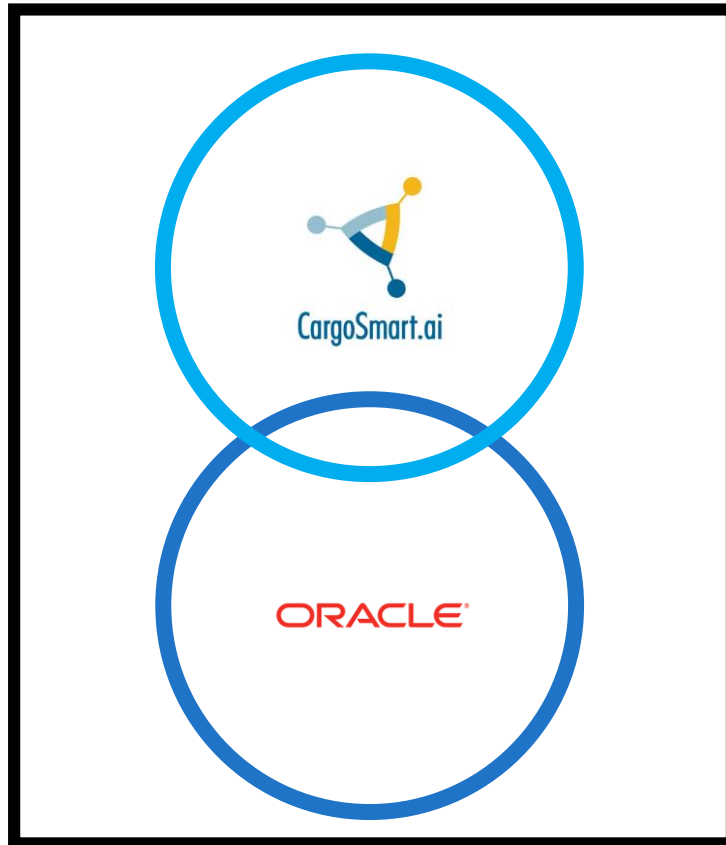
BACKGROUND

UNIQUE VALUE

PROGRESS

BACKGROUND

CargoSmart.ai
ORACLE®
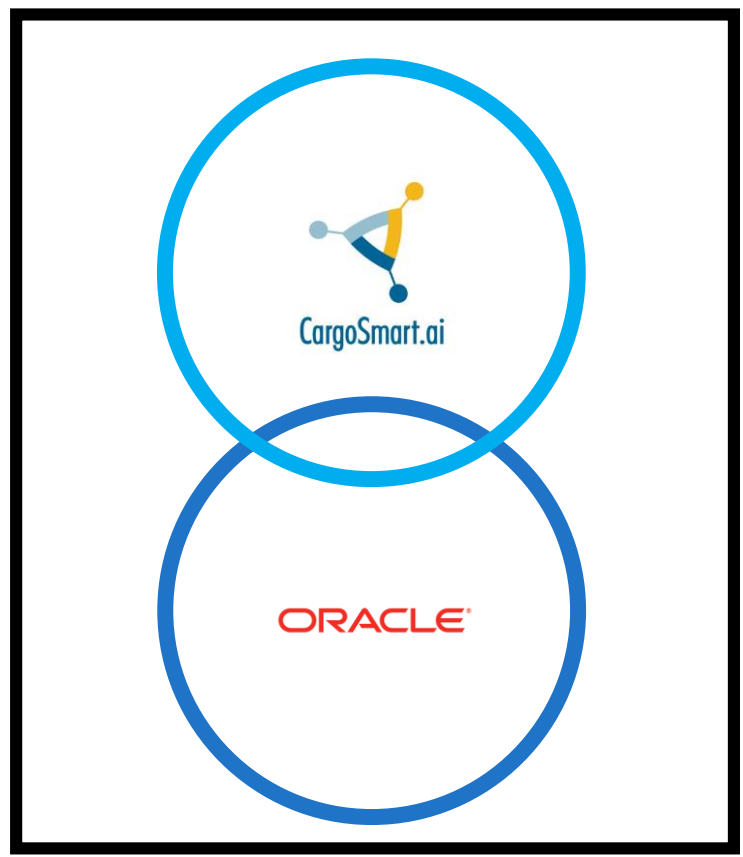
UNIQUE VALUE

A customer - driven approach to a Global shipment Network

PROGRESS

BACKGROUND

UNIQUE VALUE

PROGRESS

CargoSmart.ai

ORACLE
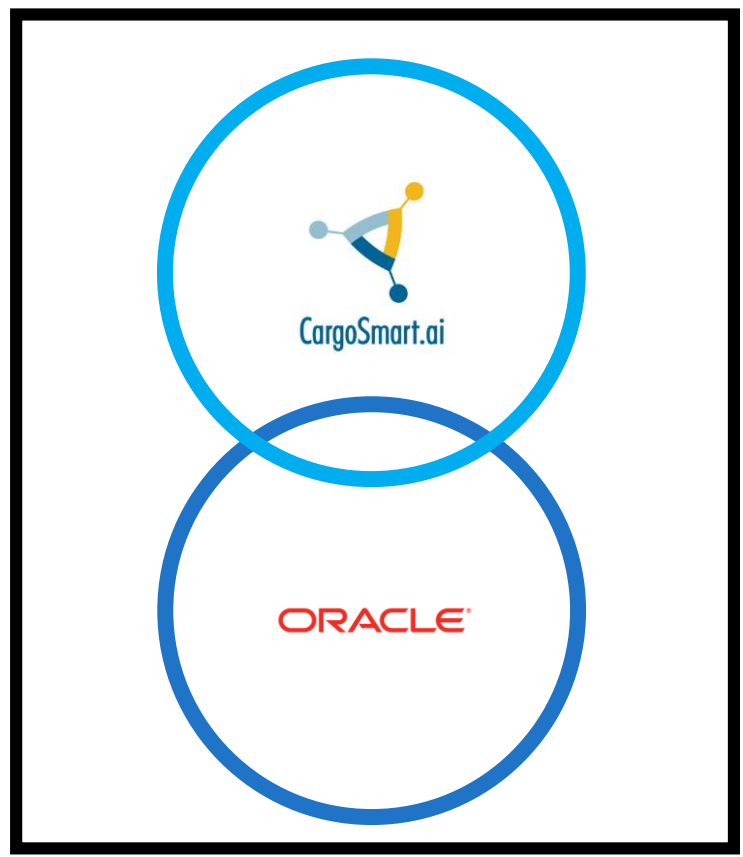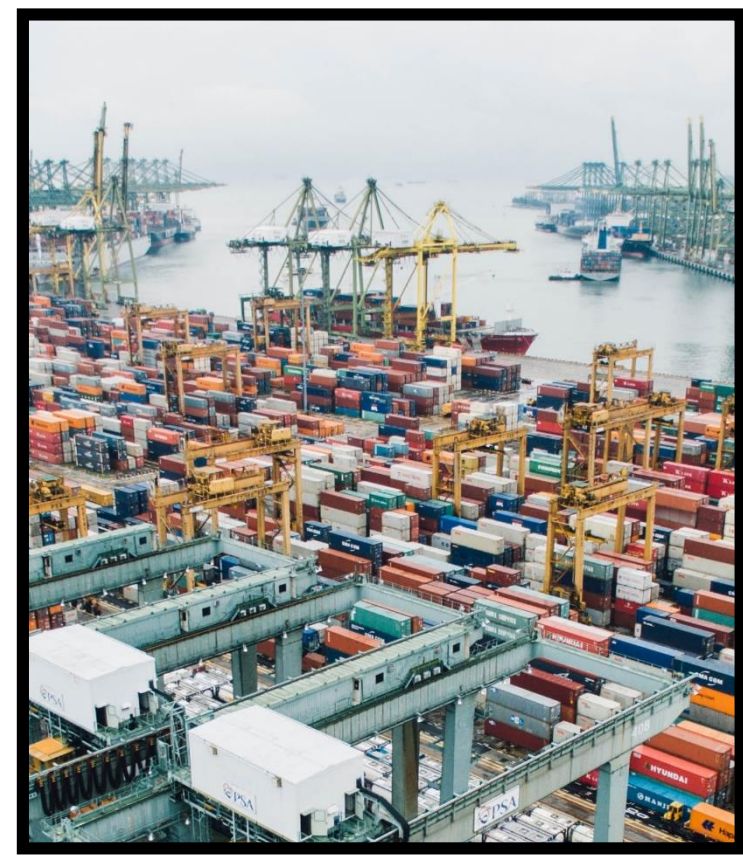
NOV '18 Release

4 Top Carriers

4 Largest Ports in Asia

NWSA SHOULD CHOOSE CargoSmart AS A DIGITAL BLOCKCHAIN SOLUTION.

CargoSmart offers key attributes
to progress NWSA's goals

THE NORTHWEST
SEAPORT ALLIANCE

Trade Partners

IP Independence

Existing Connection

WHY CARGOSMART

Export/Import Ports

3 Main Asian Ports on CargoSmart

🇨🇳 **SIP (Shanghai, China)**

🇭🇰 **Hutchinson Ports (Hong Kong)**

🇸🇬 **PSA International (Singapore)**

% OF THE TOTAL VALUE OF IMPORTS & EXPORTS AT NWSA

- Other 1%
- China 47%
- Japan 35%
- Thailand 2%
- Hong Kong 1%
- Taiwan 6%
- South Korea 8%
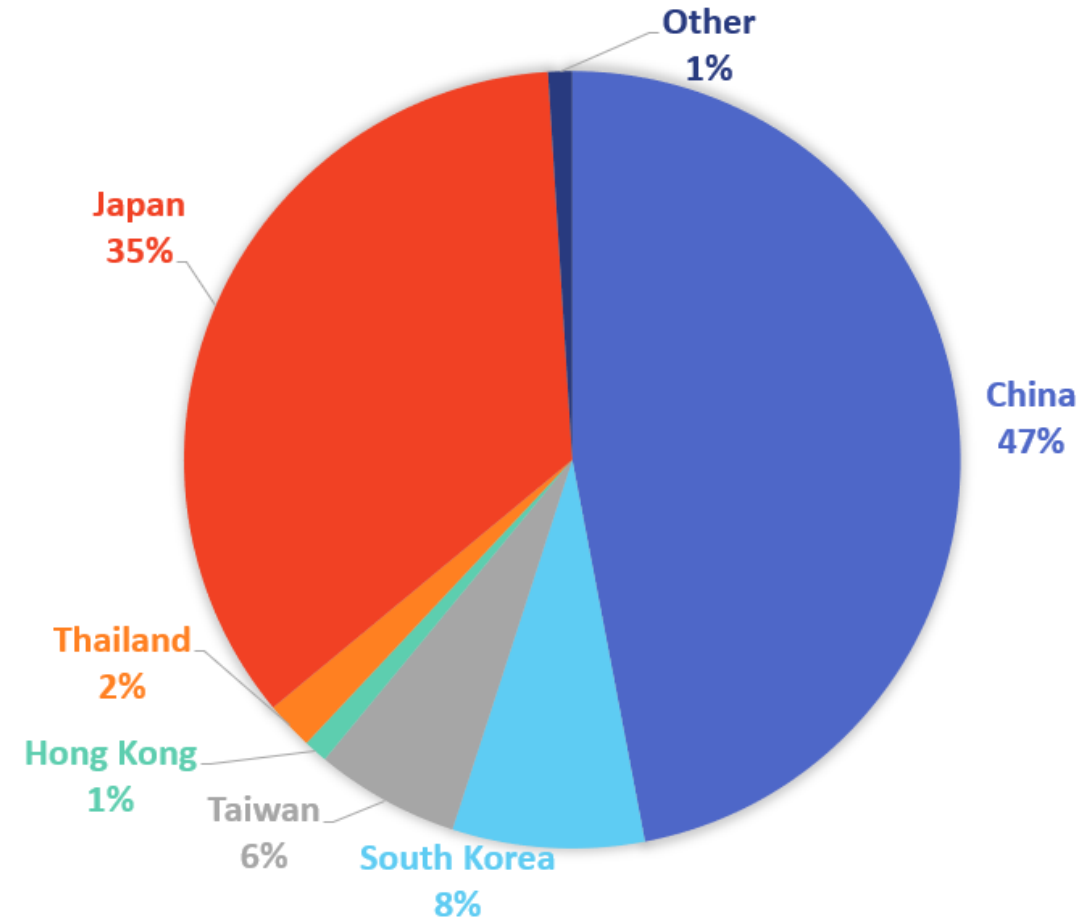
WHY CARGOSMART

Carriers/ Shippers

4 of 8 Main Carriers are on CargoSmart

- **COSCO - China**
- **Evergreen - Taiwan**
- **Yang Ming - Taiwan**
- **OOCL - Hong Kong**

CARGOSMART VERSUS TRADELENS' ACTIVITY WITH NWSA

CargoSmart
30%

TradeLens
6%

Others
64%
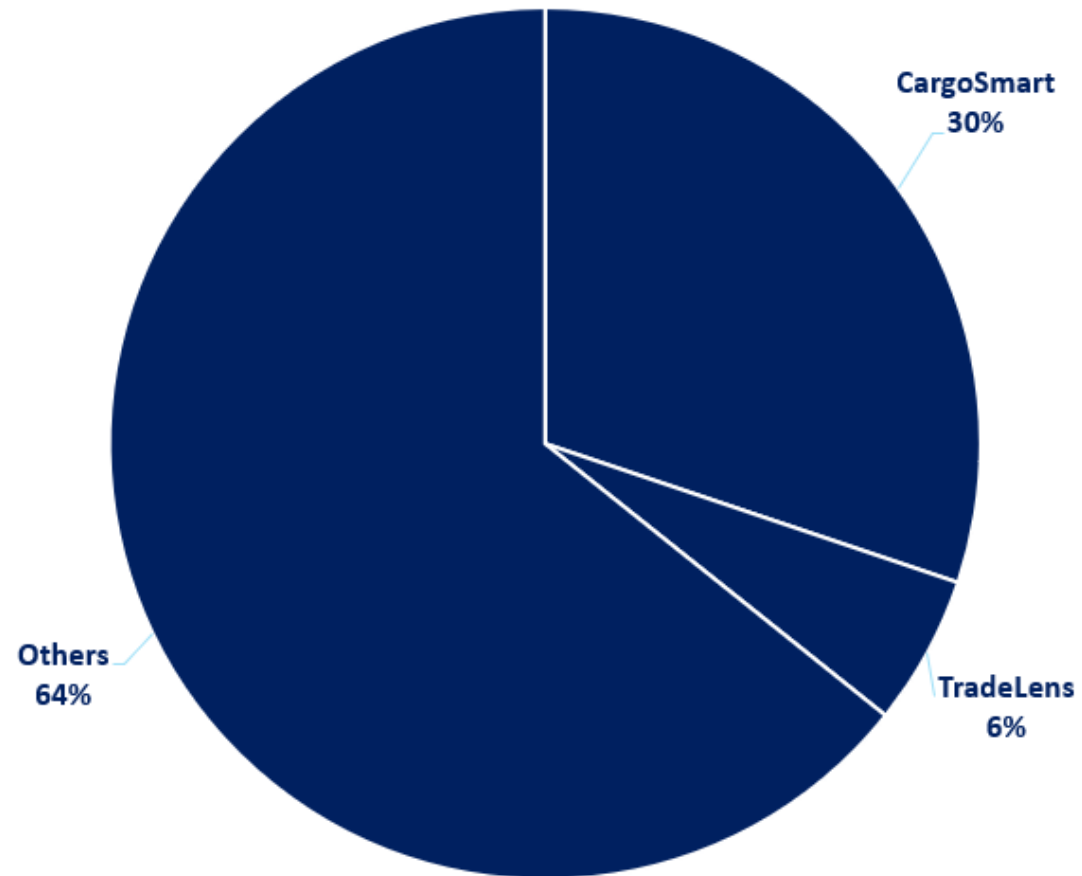
IP Independence

❌ Maersk's competing carriers refuse to onboard **TradeLens due to conflict of interest**

✅ **CargoSmart, as a software solution provider, is independent and free of conflict of interest**

✅ CargoSmart's **user value centric model is appealing to newcomers**

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SEAPORT ALLIANCE

Existing Connection

DON ESTERBROOK, DEPUTY CEO, NWSA

Ex Director of Business Development and PNW Regional Sales Manager at CargoSmart

✓ **NWSA has an existing tie with CargoSmart**

✓ **Utilize existing tie to join early adopter program**

✓ **Don is independent of CargoSmart**

RISKS & MITIGATIONS

THE NORTHWEST
SEAPORT ALLIANCE

RISK	MITIGATION
PLATFORM FAILURE	Use a redundant system during the implementation phase

RISKS & MITIGATIONS

RISK	MITIGATION
PLATFORM FAILURE	Use a redundant system during the implementation phase
LOW PERFORMANCE	Have benchmarks using KPIs and performance evaluations to correct early

RISKS & MITIGATIONS

Our team has developed a few mitigation measures to potential risks

THE NORTHWEST
SEAPORT ALLIANCE

RISK	MITIGATION
PLATFORM FAILURE	Use a redundant system during the implementation phase
LOW PERFORMANCE	Have benchmarks using KPIs and performance evaluations to correct early
TENANT RELUCTANCE	Draft implementation plans to help ease transition and concerns

FINANCIALS

KEY POINTS

- NWSA FACILITATES BUSINESS

- DRIVE THE ECONOMY

- TAX PAYER MONEY

2013

THE PORTS' ECONOMIC IMPACTS
Revenues and Incomes

Ports' related economic activity is affiliated with **$138.1 billion** in total economic activity in the state, which is 1/3 of Washington's GDP.

After onboarding, a positive stream of Financial & efficiency benefits are expected

THE NORTHWEST
SEAPORT ALLIANCE

GENERATE SAVINGS
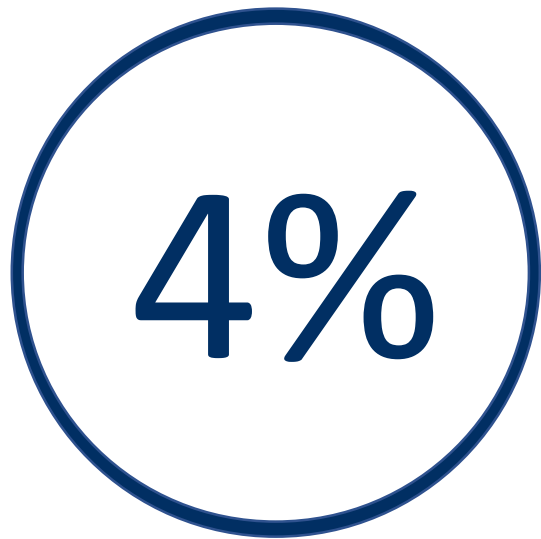
INCREASED EFFICIENCY

GDP OVER 5 YEARS

4%

8%

+$32B
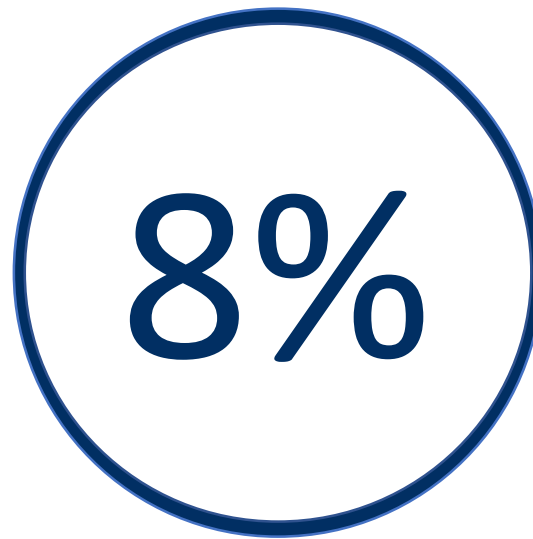
CONCLUSION

GOALS	CREATE VALUE FOR THE STATE OF WASHINGTON	IMPROVE EFFICIENCY AT PORTS	FINANCIALLY STABLE TENANTS

STRATEGY

CARGOSMART BLOCKCHAIN PLATFORM TO PORT OPERATORS

RESULT

INTRODUCE $32B TO THE WASHINGTON ECONOMY	INCREASE EFFICIENCY BY 8%	4% SAVINGS ON OPERATIONAL COST

BOTTOM LINE

IF ADOPTED, CARGOSMART CAN BOOST PORT OPERATORS' EFFICIENCY AND REVENUES, ULTIMATELY GENERATING VALUE FOR THE WASHINGTON ECONOMY.

THANK YOU

APPENDIX

Saving Assumption

		5%	10%	15%	20%	25%	30%	35%
Efficiency Assumption	**25%**	16.1	18.8	21.5	24.2	26.8	29.5	32.2
	30%	18.8	21.5	24.2	26.8	29.5	32.1	34.9
	35%	21.5	24.3	26.8	29.5	32.2	34.9	37.6
	40%	24.2	26.8	29.5	32.2	34.9	37.6	40.3
	45%	26.8	29.6	32.2	34.9	37.6	30.2	42.9
	50%	29.5	32.2	34.9	37.6	40.3	42.9	45.6
	55%	32.2	34.9	37.6	40.3	42.9	45.6	48.3

Normal Projected GDP vs Added GDP

Past Growth	Growth
2013	2.40%
2014	3.30%
2015	3.80%
2016	3.90%
2017	4.40%
Average	3.56%

Year	Regular GDP Projection	Economy Multiplier
2019	$ 523,379,000	$ -
2020	$ 542,011,292	$ 10,238,023
2021	$ 561,306,894	$ 8,481,997
2022	$ 581,289,420	$ 6,587,967
2023	$ 601,983,323	$ 4,548,333
2024	$ 623,413,930	$ 2,355,127
Total 5 yr.		$ 32,211,446

Increased Savings

Assumed Total IndustrySavings	20%
Total Points of Failure	5
Portion Savings	4%
Portion Savings Decrease by Year	0.80%

Year	NWSA Revenue Regular Growth	NWSA Additonal Savings Growth	Portion Savings Added	Total Revenue with Saving
2019	$ 194,745	0.00%	$ -	$ 194,745
2020	$ 201,678	4.00%	$ 7,790	$ 209,468
2021	$ 208,858	3.20%	$ 6,454	$ 215,311
2022	$ 216,293	2.40%	$ 5,013	$ 221,306
2023	$ 223,993	1.60%	$ 3,461	$ 227,454
2024	$ 231,967	0.80%	$ 1,792	$ 233,759

Increased Efficiency

Total Efficiency to industry	40%
Total Points of Failure	5
Portion Increased Efficiency	8%
Portion Decreased Efficienty by Year	2%

Year	NWSA Revenue Regular Growth	NWSA Additonal Efficiency	Portion Efficiency Added	Total Revenue with Efficiency
2019	$ 194,745	0.00%	$ -	$ 194,745
2020	$ 201,678	8.00%	$ 15,580	$ 217,258
2021	$ 208,858	6.40%	$ 12,907	$ 221,765
2022	$ 216,293	4.80%	$ 10,025	$ 226,318
2023	$ 223,993	3.20%	$ 6,921	$ 230,914
2024	$ 231,967	1.60%	$ 3,584	$ 235,551

Efficiencies Together

Year	Portion Savings Added	Portion Savings Added	Total Added Revenue NWSA
2019	$ -	$ -	$ -
2020	$ 3,895	$ 7,790	$ 23,369
2021	$ 3,227	$ 6,454	$ 19,361
2022	$ 2,506	$ 5,013	$ 15,038
2023	$ 1,730	$ 3,461	$ 10,382
2024	$ 896	$ 1,792	$ 5,376

Impact on greater WA Economy

Revenue 2013 Tacoma	$ 190,000
Revenue 2013 Seattle	$ 125,000
Total Seattle & tacoa	$ 315,000
Facilitated GDP	$ 138,000,000

NWSA Revenue/Faciliated GDP Mulpt	438.10

Year	Total Added Revenue	Economy Multiplier
2019	$ -	$ -
2020	$ 23,369.40	$ 10,238,022.86
2021	$ 19,361.08	$ 8,481,997.18
2022	$ 15,037.75	$ 6,587,967.21
2023	$ 10,382.06	$ 4,548,332.56
2024	$ 5,375.83	$ 2,355,126.60

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Annual percent change of the real GDP in Washington from 2000 to 2017

https://www.statista.com/statistics/306793/washington-gdp-growth/

https://fred.stlouisfed.org/series/WANGSP

THE PORTS' ECONOMIC IMPACTS
Revenues and Incomes

Ports' related economic activity is affiliated with **$138.1 billion** in total economic activity in the state, which is 1/3 of Washington's GDP.
(2013)

https://www.nwseaportalliance.com/sites/default/files/EconomicImpactFactSheet.pdf
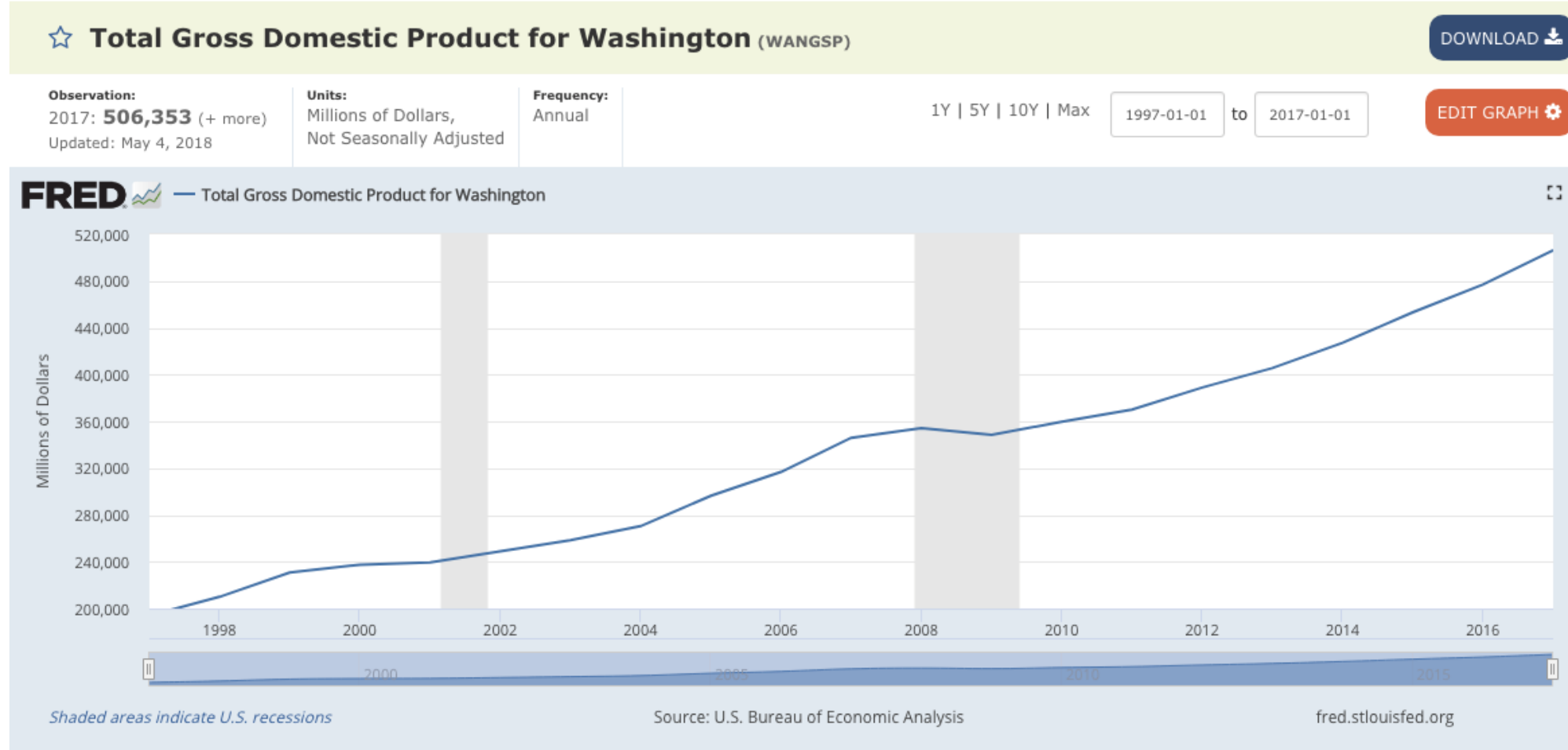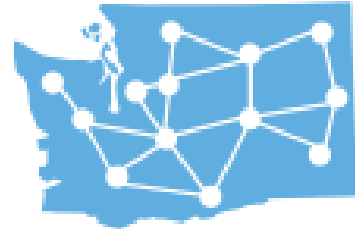
Statement of Revenues, Expenses, and Changes in Net Position

The change in net position is an indicator of whether the overall fiscal condition of the Enterprise Fund has improved or worsened during the year. Following is a summary of the Statement of Revenues, Expenses, and Changes in Net Position (in millions) for the years ended December 31, 2013, 2012 and 2011:

	2013	2012 (Restated)	2011 (Restated)
Operating revenues	$ 545.0	$ 521.7	$ 483.2
Operating expenses	307.0	298.2	267.4
Operating income before depreciation	238.0	223.5	215.8
Depreciation	171.4	167.3	158.1
Operating income	66.6	56.2	57.7
Nonoperating income (expense)—net	23.5	(35.6)	28.0
Capital contributions	21.4	30.7	21.2
Increase in net position	111.5	51.3	106.9
Net position—beginning of year, as restated (Note 1)	2,937.1	2,885.8	2,778.9
Net position—end of year	$ 3,048.6	$ 2,937.1	$ 2,885.8

The beginning balance of net position for 2011 includes a $25.5 million restatement resulting from the adoption of GASB Statement No. 65, *Items Previously Reported as Assets and Liabilities.* The restated amount includes primarily the write-off of deferred finance costs as of January 1, 2011, except for a portion related to prepaid insurance costs and surety costs.

https://www.portseattle.org/sites/default/files/2018-04/CAFR_2013.pdf

Top 10 import commodities
(by value)

Commodity	Value
Industrial machinery	$7 billion
Vehicles and parts	$6.5 billion
Electronics	$5.8 billion
Toys, games and sports equipment	$2.3 billion
Furniture	$1.5 billion
Aircraft and parts	$1.3 billion
Plastics	$1.3 billion
Iron and steel products	$1.2 billion
Optical and medical equipment	$962 million
Footwear	$943 million

VALUE OF INTERNATIONAL IMPORTS TOTALED:

$37.5 billion

(Source: World Institute for Strategic Economic Research)

Highlights 2013

Financial highlights

	dollars in thousands
Revenues	125,342
Increase in net position*	79
Working capital	113,014
Capital additions	32,254
Land, facilities and equipment	925,111
Net long-term debt	601,378
Net position	499,837
Debt service coverage ratio (senior lien)	5

*includes capital contribution

https://www.portoftacoma.com/sites/default/files/2013AnnualReport.pdf

NWSA ADVANTAGES

Competitive advantages

International trade

We are the fourth-largest container gateway for containerized cargo shipping between Asia and major distribution points in the Midwest, Ohio Valley and the East Coast.

We are also a major center for bulk, breakbulk, project/heavy-lift cargoes, automobiles and trucks. We connect to the second-largest concentration of distribution centers on the West Coast.

Top international trading partners include:

- China/Hong Kong
- Japan
- South Korea
- Taiwan
- Vietnam
- Thailand
- Indonesia
- Australia
- Malaysia
- India

The value of this two-way international trade totaled more than $75.3 billion in 2017. Imports were $58.3 billion and exports were $17 billion of that total. See more cargo stats.

https://www.nwseaportalliance.com/about

Statements of Revenues, Expenses and Changes in Net Position (dollars in thousands):

	2017	2016
Operating revenues	$ 194,985	$ 195,170
Operating expenses	85,895	80,264
Operating income	**109,090**	**114,906**
Non-operating revenues (expenses):		
Interest income	777	755
Net decrease in the fair value of investments	(43)	(328)
Other non-operating (expense) income, net	(297)	7,835
Total non-operating revenues, net	**437**	**8,262**
Capital grant contributions	324	---
Increase in net position before net Managing Member contributions (distributions), net	**109,851**	**123,168**
Managing Member contributions (distributions), net	(33,460)	7,969
Increase in net position	**76,391**	**131,137**
Net position, beginning of year	131,137	---
Net position, end of year	**$ 207,528**	**$ 131,137**

https://www.nwseaportalliance.com/sites/default/files/2017_annual-report.pdf

Exhibit 9 Industry Pain Points and Global Trade Digitization Benefits (partial list)

Pain Points | GTD Benefits

Shipping Lines

Pain Points	GTD Benefits
Misdeclared cargo and safety considerations	Audit trail and immutable records of source documents (packing list, commercial invoice) reduce probability of misdeclaration of dangerous goods, leading to safer operations for all stakeholders
Long vessel queues at ports lead to lengthy turn-around times	Conversational ETA communications with terminals allows shipping lines to react to the issues causing queues at ports, including occupied berth space and pilot availability, leading to optimized speed and fuel use

Ports and Terminal Operators

Pain Points	GTD Benefits
Lengthy customs clearance processes limit the overall capacity and efficiency of the port	Clearance is streamlined for shippers using Paperless Trade, reducing the number of inspections and driving down average dwell times
Costly development and support of point-to-point EDI integrations with shipping lines and the port community	Simplifies and reduces the cost of connecting to shipping lines and the broader port community by leveraging an industry standard platform participants are already connected to

THE NORTHWEST SEAPORT ALLIANCE

Freight Forwarders

Difficulties identifying root causes of shipment exceptions lead to finger pointing	→	Clear audit trail and data provenance makes it easier to avoid problems, but also aids in diagnosing and correcting them when they occur
Long turnaround times on customs process exceptions	→	Significantly reduces time to correct paperwork errors by connecting source documents with customs filings via secure audit trail

Customs Authorities

Costly, paper-intensive work	→	Reduces manual paperwork allowing officers to focus more on risk assessment
Lack of visibility into inland transportation hampers risk assessments	→	Visibility into the entire container shipment lifecycle, from empty container pickup to return, provides authorities with richer risk-assessment information

Shippers

High administrative costs for managing supply chain transactions	→	Eliminates manual processes (checking multiple Track and Trace dashboards, calling/emailing service providers) for obtaining visibility information.
Border delays due to lost/erroneous paperwork	→	Improves document turnaround times; makes more expensive air freight less attractive compared to ocean.

Source: Company documents.

THE NORTHWEST
SEAPORT ALLIANCE

Steve Queen • 3rd

Sr. Manager Operations

Poulsbo, Washington

https://www.linkedin.com/in/steve-queen-a1a8117a/

Dustin Stoker, Chief Operations Officer

Dustin Stoker leads alliance operations.

He oversees all port operations, from waterway management and road and rail functions to breakbulk and terminal operations. Stoker's team is charged with establishing the NWSA's Operations Service Center to provide best in class service delivery and customer care.

Stoker brings more than 20 years of experience in both domestic and international terminal management.

He most recently served as director of operations at the Port of Tacoma since 2013.

Before joining the Port of Tacoma, Stoker served as director of Deltaport at Port Metro Vancouver, B.C., with Terminal Systems, Inc. He also has served as the chief operations officer at Abu Dhabi Terminals, and in management positions at Port of Salalah/APM Terminals and APM Terminals in the Netherlands.

Stoker holds a bachelor's degree in business administration with a concentration in management from the University of Washington.

https://www.nwseaportalliance.com/about/leadership-team

JOHN BELL

Northwest Seaport Alliance's operations program manager

Steve Balaski • 3rd

Sr. Manager, Business Development at The Northwest Seaport Alliance

Greater Seattle Area

https://www.linkedin.com/in/stevebalaski/

Don Esterbrook, Deputy CEO

Don Esterbrook is the deputy CEO leading the commercial and operations groups.

He has nearly 30 years of maritime industry experience, with 15 years in senior leadership.

Before joining the NWSA, Esterbrook spent the past three years as the Port of Tacoma's chief operating officer and deputy CEO, where he oversaw the Port's operations, maintenance, security, labor relations and asset management. He was hired by the Port of Tacoma in 2010 as the chief commercial officer, a new position created to more closely align the Port's operations, commercial lines of business, and real estate and asset management.

Esterbrook's past experience also includes 16 years with Orient Overseas Container Line, most recently as regional sales director for nine western states. His other OOCL roles included president and general manager of operations in the Philippines, director of business development for the company's Cargo Smart organization and regional sales manager for the Pacific Northwest region.

He is on the board for the Tacoma Waterfront Association.

Esterbrook holds a bachelor's degree in business administration, with a computer science minor, from Pacific Lutheran University.

https://www.nwseaportalliance.com/about/leadership-team

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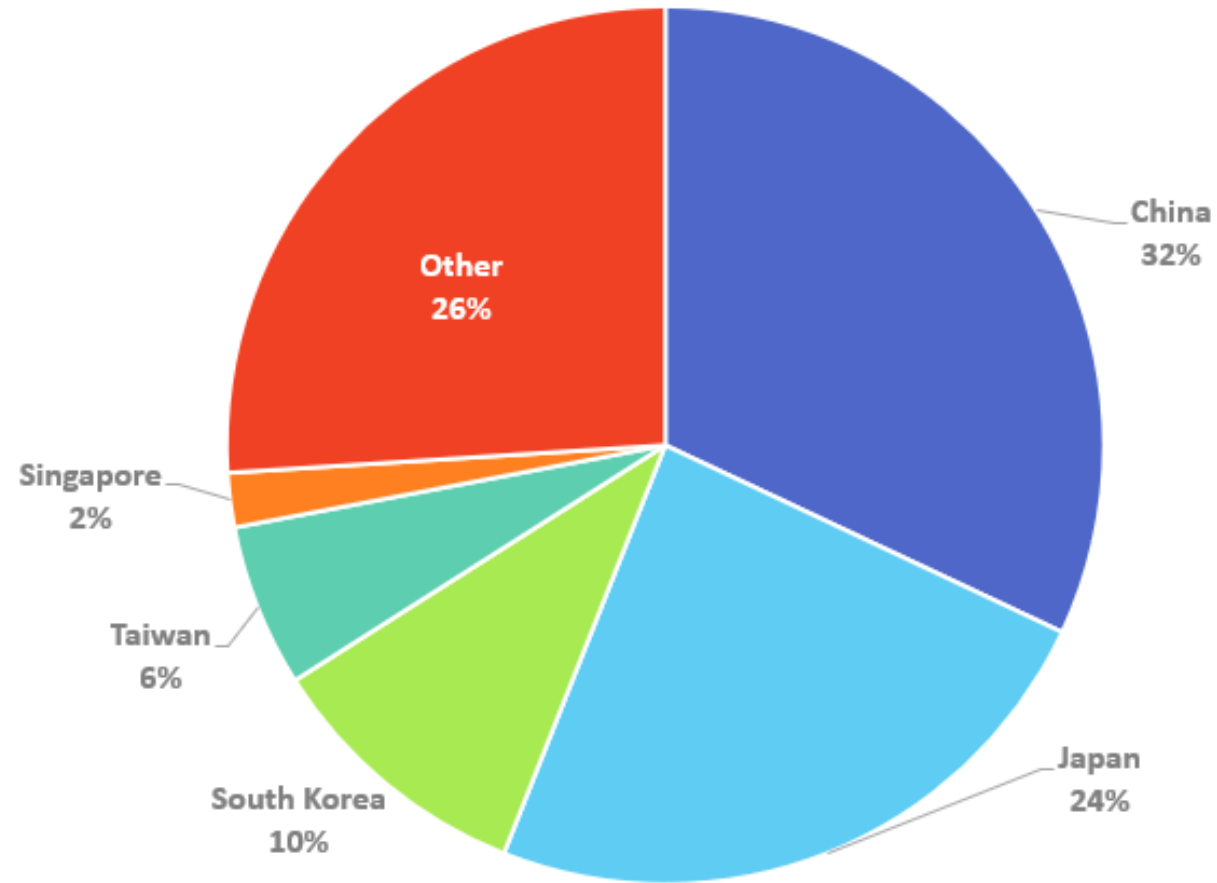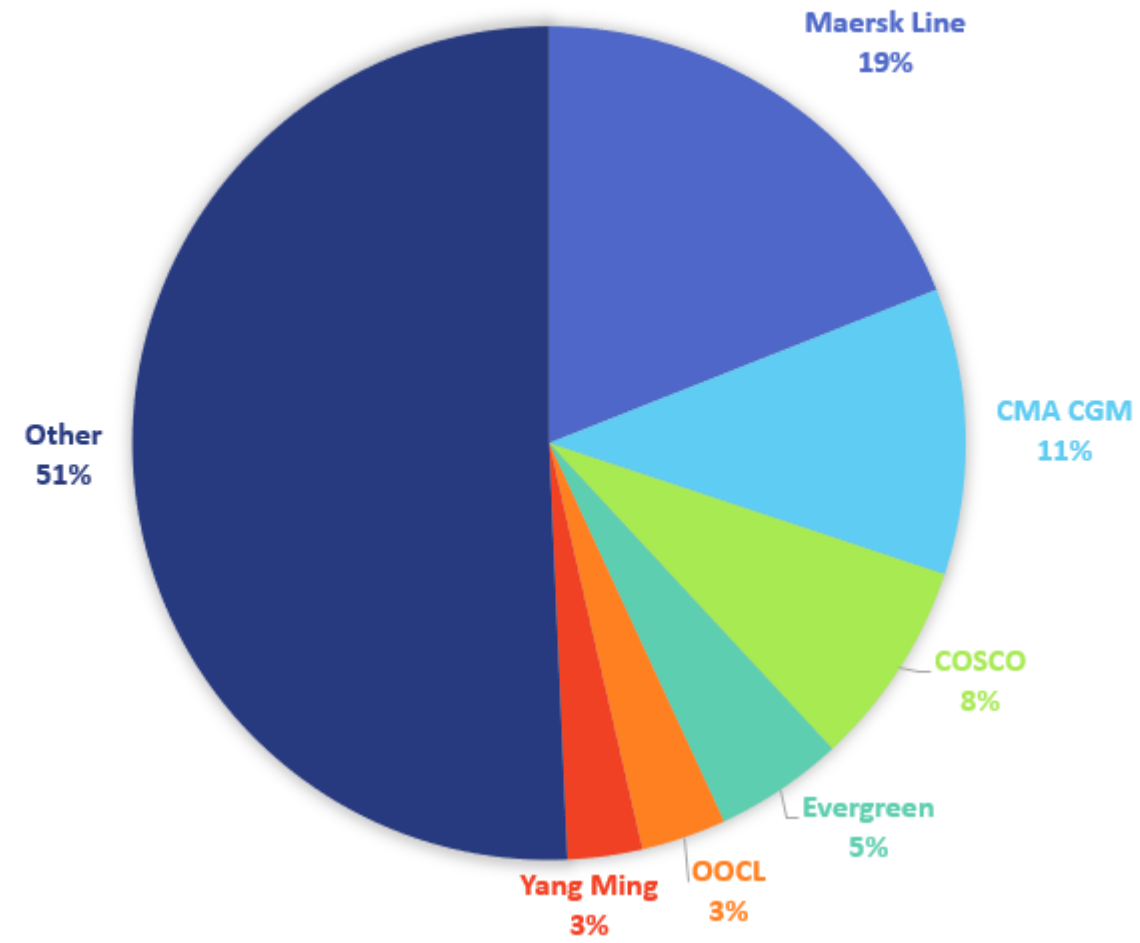| Shipping Alliance	Service	Busan	Gwangyang	Hakata	Hitachinaka	Hong Kong	Incheon	Kaohsiung	Kobe	Lianyungang	Nagoya	Nansha	Ningbo	Osaka	Qingdao	Sendai	Shanghai	Shekou	Shimizu	Taipei	Tokyo	Tomakomai	Xiamen	Xingang	Yantian	Yokohama	Balboa	Caucedo	Cartagena	Cristobal	Manzanillo (MX)	Manzanillo (PA)	Puerto Quetzal	Antwerp	Barcelona	Cagliari	Civitavecchia	Dammam	Doha	Fos	Genoa	Gioia Tauro	Hamburg	Jebel Ali	Jubail	La Spezia	Le Havre	Lisbon	Livorno	Rotterdam	Sines	Sohar	Southampton	Tangier	Valencia	Adelaide	Auckland	Melbourne	Papeete	Sydney	Tauranga	Cai Mep	Laem Chabang	Singapore
Ocean Alliance	PNW1	x											x		x		x	x					x	x	x																	x	x			x	x			x								x							x
	TPN					x							x	x	x		x			x					x																																								
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2M	TP9/Maple	x				x							x				x						x		x	x																																						
MSC	NCX																										x		x	x				x						x							x			x			x		x					x				
SM Line	PNS	x	x										x				x			x					x																																							
HMM	PN2*	x				x	x										x								x																																							
	PS1	x	x				x										x																																															
Westwood	WSL	x	x	x								x		x					x	x	x																																												
	WSL-1	x			x							x		x	x				x	x						x																																						
	WSL-2	x	x	x								x		x						x	x																																											
COSCO-PIL-WH-YM	AAC3								x				x				x																																															
HSUD-HAPL	MPS																										x	x			x	x	x			x	x									x	x						x	x							x	x			
ANL-HSUD-HAPL	WAN																																																											x	x	x	x	x	x	

Zim purchases slots on service

Ocean Alliance — APL, CMA CGM, COSCO Shipping, Evergreen, OOCL

THE Alliance — Hapag-Lloyd, Ocean Network Express (ONE), Yang Ming

2M — Maersk, Mediterranean Shipping Co. (MSC)

Based on information provided by Bluewater Reporting, carriers and carrier web sites as of 11/01/18. Subject to change.

% of Total Imports to the Port of Seattle & Tacoma

Thailand 2%
Other 9%
Taiwan 6%
South Korea 8%
Japan 23%
China 52%

THE NORTHWEST
SEAPORT ALLIANCE

% of Total Exports to the Port of Seattle & Tacoma

China 32%
Japan 24%
South Korea 10%
Taiwan 6%
Singapore 2%
Other 26%

MARKET SHARE OF TOP VENDORS IN GLOBAL CONTAINER FLEET MARKET

- Maersk Line 19%
- CMA CGM 11%
- COSCO 8%
- Evergreen 5%
- OOCL 3%
- Yang Ming 3%
- Other 51%

NWSA

As a port authority, NWSA has unique needs as a participant in a digital trade platform for the shipping container industry

THE NORTHWEST
SEAPORT ALLIANCE

PAIN - POINTS

PORT OPERATOR

BENEFITS

Costly development and support
Of point-to-point EDI integrations with Shipping lines and the port community.

Reduces costs of connection
By leveraging an industry standard platform Participants are already connected to.

Inaccurate ETA & ETDs
Leads to poor planning and use Of resources and port space.

Quick and accurate ETA & ETDs
For all port community participants Leads to improved utilization of port assets.

Fluctuating Equipment Use
Makes it difficult for port yard management Leading to operational difficulties.

Advanced Communication
Provides better data for decision-making Leading to better truck and vessel service times.

CHINA & TARIFFS

"Our success as an airport and seaport gateway is inextricably linked to China. Last year, more than $27 billion in imports from China came through Seattle and Tacoma cargo terminals, with an additional $1.1 billion in imports from China via Sea-Tac. In addition, almost $5 billion in exports to China traveled through our cargo terminals in 2017, plus another $2.2 billion in exports to China through Sea-Tac.

"Creating a fair and level playing field for U.S. exporters competing in the global economy is one of the most important goals of U.S. trade policy. From opening new markets through trade agreements to enforcing existing trade rules, we all win when American businesses and entrepreneurs can sell more goods to more people throughout the world. There is clearly more that must be done to achieve that goal, and I think it is fair to say that the only debate we are having in this country is regarding what are the best tactics to achieve our desired outcome.

"While there are justifiable concerns about China's trade practices, we continue to believe that productive engagement and negotiations are the best path to ensuring a fair and level playing field for mutually beneficial trade. The U.S. must be clear on the desired remedies sought, and then tariffs should be a measure of last resort that are narrowly targeted to address the problem and minimize the unintended impacts on Americans.

https://www.nwseaportalliance.com/news/4122018/nwsa-ceo-tells-congress-tariffs-pose-regional-economic-risks

Tri-City Herald

The Washington Department of Agriculture calculates $650 million in agriculture exports is at risk — $480 million to China and $166 million to Mexico.

Locally grown and processed crops such as apples, wheat, cherries, and hay and potato products are included on the tariff hit list.

As for wheat, Scott Yates, spokesman for the Washington Grain Commission, said that around this time last year the Northwest had exported 270,000 metric tons worth $51 million to China.
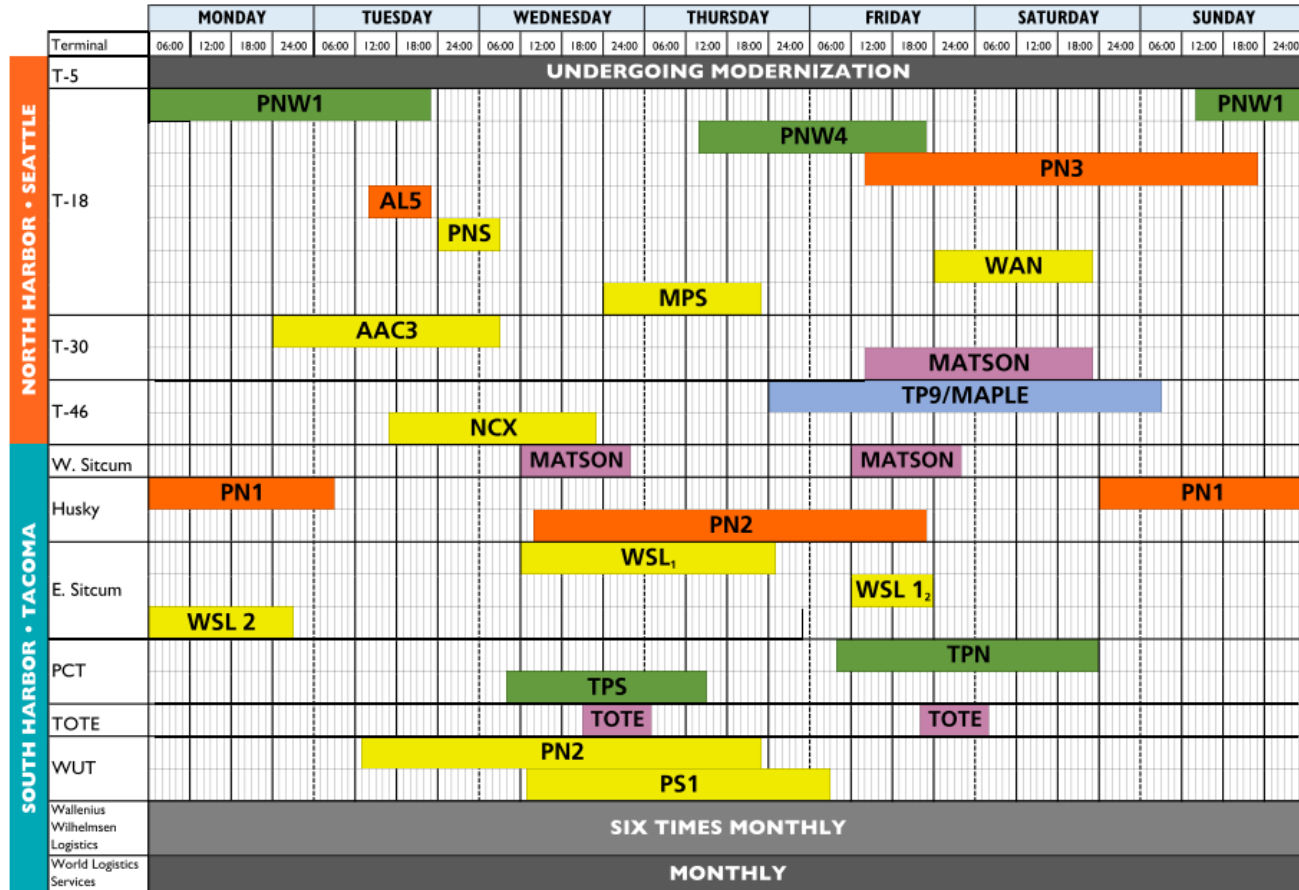
Since the trade war started, "We haven't sold anything this year," Yates told The Herald.

Stage 1	Stage 2	Stage 3	Stage 4	Go - Live
Pitch platform to Seattle and Tacoma commissioners	Identify in-scope facilities	Map port shipping milestones to the platform	Perform integration and conduct integration testing	Authorize port systems to communicate on the platform
Identify benefits to the greater Washington economy	Secure participation of logistics partners	Develop integration specifications (onboarding roadmap)	Set up and train users	Provide feedback on enhancements
Get approval from the commissioners	On-board CargoSmart team	Assess impact to business	Test workflow	Monitor platform KPIs and value drivers
		Define user and security requirements	Institute business process/org changes	

- Cargo Losses

- Activity Delays

- Reduction in Personal Cost

- Reduction in Operating Overhead

- Improvement on Inventory Turnover Rate

- Platform Downtime and Recovery Rate

- Other Supply Chain Participant Adoption Rate

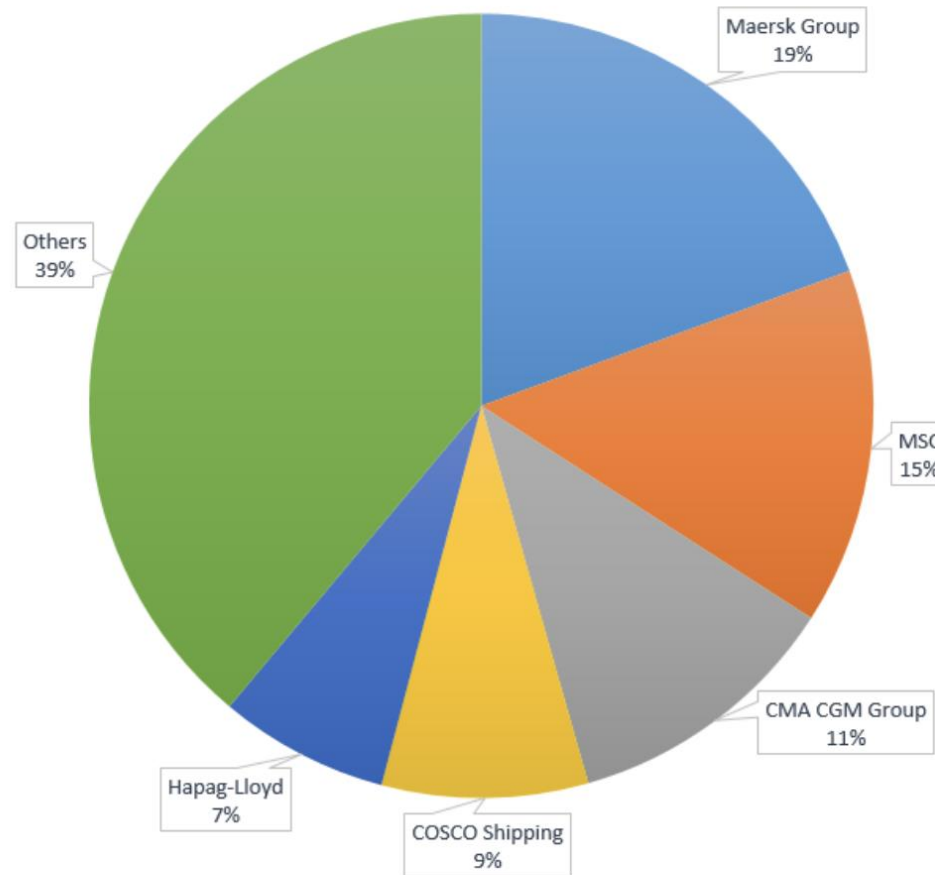PROFORMA TERMINAL BERTH SCHEDULE - As of 10/1/2018

Exhibit 4   Market Share of Top Vendors in Global Container Fleet Market, March 2018 (% volume)

- Maersk Group 19%
- MSC 15%
- CMA CGM Group 11%
- COSCO Shipping 9%
- Hapag-Lloyd 7%
- Others 39%

Source: Company documents.

MILESTONES & DOCUMENTS

THE NORTHWEST SEAPORT ALLIANCE

| BCO / NVO | FFW / CHB / 3PL | Inland Transportation | Customs / Government Authorities | Ports / Terminals | Ocean Carriers | Ports / Terminals | Customs / Government Authorities | FFW / CHB / 3PL | Inland Transportation | BCO / NVO |
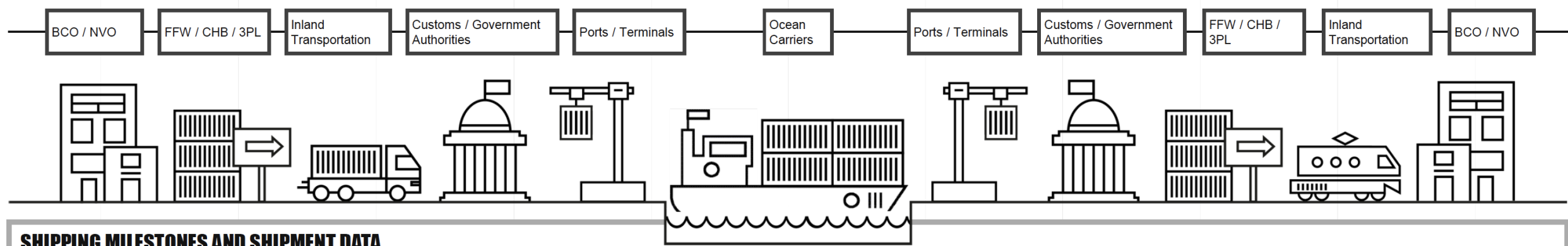
SHIPPING MILESTONES AND SHIPMENT DATA

- Start container tracking
- Empty container picked up from depot
- ETA empty container at stuffing site
- ATA Empty container at stuffing site
- Container stuffing completed at inland location
- VGM submitted
- Container sealed
- ATD Packed container from stuffing site
- Estimated gate in for packed container at terminal export
- Gate in full at terminal export
- ETD packed container from export terminal
- Packed container loaded
- Export documentation cleared
- Container ready to load
- ATD packed container from export terminal
- ETA packed container at import terminal
- Temperature update
- Estimated discharge time for packed container at import terminal
- Import documentation cleared
- Container selected for inspection
- ATA packed container at import terminal
- Packed container discharged at import terminal
- Estimated gate out of packed container from terminal import
- Gate out packed container from terminal import
- ETA packed container at stripping location
- ATA packed container at stripping location
- Seal removed
- Packed container stripped at inland location
- Empty container ready for pick-up
- Empty container picked up from stripping location
- ATA empty container at depot
- Container tracking ended

Not exhaustive list of milestones managed by platform

STRUCTURED AND UNSTRUCTURED DOCUMENTS

- Packing List
- Bill of Lading
- Export Documentation
- Advance Declaration
- Pre-Paid Invoice
- Certificate of Origin
- Shipping Instructions
- ISF
- Geography Specific Certificate
- Dangerous Goods Declaration
- Cargo Specific Certificate
- Customs Clearance
- Commercial Invoice
- Import Documentation

Not exhaustive list of documents managed by platform

SHIPPER PAIN-POINTS

PAIN POINTS

1. High administrative costs and process latency in obtaining shipment visibility

2. Lack of trust regarding the fees on freight invoices, especially surcharges, requires costly, time-consuming and error-prone validation steps

3. Inefficient lane routing leading to delays, increased costs and difficulties in inventory forecasting and planning

4. Reactive/delayed event management after shipment has been missed, causing delays and additional detention and demmurage charges

5. Inefficient trade document exchange between trading partners leading to errors, delays and higher compliance costs

6. Delayed Customs clearance due to security/forgery concerns and validating accuracy of transactions by the regulatory authorities

7. High costs charged by customs brokers and freight forwarders for clearance services

8. High IT costs for integrating with service providers / logistics partners

BENEFITS

1. Eliminates manual processes (checking multiple Track and Trace dashboards, calling/emailing service providers) and delays related to ecosystem data processing

2. Full, trusted visibility on the end-to-end journey of a shipment will enable shippers to efficiently validate fees and surcharges

3. Improved analysis on shipping times / delays on specific lanes leading to changes in routing and/or better root cause identification to address service issues and improve inventory management

4. Identify shipments that are on the verge of rolling (missing Vessel departure). Leading indicators can help Logistics group proactively adjust and/or alert Customer Service

5. Improved efficiency and timeliness in the creation and distribution of documents that routinely get generated and exchanged between trading partners

6. Expedite the customs clearance process by providing document and transactions authenticity and security via digital workflow

7. Simplified process and workflow-driven compliance policies enables shippers to perform the function themselves, potentially at a fraction of the cost

8. Single, standards-based publish/subscribe interface for obtaining visibility data, eliminates costly maintenance of costly, error-prone point-to-point interfaces with supply chain; reduces service provider switching costs

PAIN POINTS

1. Unnecessary interventions, or "false positives", due to late and missing information

2. Costly, paper-intensive work

3. Lack of visibility into inland transportation hampers critical activities, such as risk assessments

4. Fraud and forgery are major issues

5. High effort to integrate ecosystem into multiple platforms

6. Export and import processes can be cumbersome for traders, reducing the appeal of the country as a market for business.

BENEFITS

1. More complete information, available earlier and with better provenance, allows for better targeting and more effective decisions about which containers to inspect. BCOs willing to share their data will face less delays due to inspections (i.e. AEOs)

2. Reduces manual paperwork and enables greater automation allowing authorities to focus on more critical activities such as targeted risk assessments

3. Provides greater visibility and transparency into the entire container shipment lifecycle providing authorities with richer information to support and plan for assessment activities

4. ◉ Reduces fraud by replacing inspections and preferential duties paper documents with more secure Blockchain-based documents
   ◉ Disincentivizes temptation to mis-declare goods as original shipping documentation is readily available
   ◉ Increases probability of catching bad actors due to a more robust audit trail for documents and event data

5. Supplements or enables a National Single Window, leveraging an industry standard platform, and decreases the need for connections to multiple platforms

6. Improves trade facilitation as customs authorities can access additional documents when required for control, without adding workload to traders. ClearWay can streamline import and export processes.

PAIN POINTS

BENEFITS

1. Costly development and support of point-to-point EDI integrations with shipping lines and the port community

2. Inaccurate ETA & ETDs of vessels and intermodals leads to poor planning and use of port and terminal assets

3. Fluctuating equipment flows make it difficult for yard density management, leading to operation difficulties including suboptimal stack placement

4. Lengthy truck and vessel queues and suboptimal asset utilization adversely impact port and terminal operations

5. Slow message receival from authorities causes delays and poor planning

6. Highly competitive environment given the rise of global port capacity and increased clout of a more consolidated shipping line industry

1. Simplifies and reduces the cost of connecting to shipping lines and the broader port community by leveraging an industry standard platform participants are already connected to

2. Quick, easy, conversational electronic communications of ETAs for all port community participants improves utilization of port assets

3. Advance communication on aggregated booking volumes and next mode of transport provides better data for stack placement decisions, leading to better truck and vessel service times

4. Accurate and frequently-updated ETAs, improved stack placement, faster service times, and optimization and predictive capabilities lead to shorter queues at the port, reduced environmental impact, and better asset planning and utilization (barges, cranes, etc.).

5. SIP event data around authority activities will be received more quickly allowing for better yard planning. This is especially the case for ports and terminals not connected directly to the authorities today

6. Drive competitive advantage with cheaper, easier sharing of port data; extend visibility of information across end-to-end shipping corridors; opportunity to more fully exploit investment in port community systems

FREIGHT FORWARDERS PAIN-POINTS

PAIN POINTS

1. Costly manual data collection from different sources and in different formats for population of Track and Trace dashboard

2. Costly development and support of point-to-point integrations with a large network of service providers and logistics partners

3. Too dependent on inland transportation providers for the data to provide visibility to customers

4. Limited insight on the performance and availability of inland transportation providers hampers effective transportation planning

5. High costs and sometimes poor service in providing customs brokerage services

6. Long turnaround times on customs process exceptions

7. Difficulties identifying root causes of shipment exceptions lead to finger pointing

BENEFITS

1. Common, end-to-end platform provides a single, standard source for supply chain visibility event data enabling faster and improved customer service

2. Reduces costs through the availability of a centralized information backbone

3. Multiple mechanisms for obtaining inland transport data (API integrations, mobile app, IOT devices) allows for a more value-focused sourcing strategy and provides customers with almost immediate event information in a single platform

4. Historical and current data from all supply chain network members enables transportation planners to more complete information, allowing them to effectively plan logistics leading to improved customer satisfaction

5. Improves competitiveness by reducing the costs of information collection and increasing focus on higher-value services such as compliance

6. Significantly reduces time to correct paperwork errors by connecting source documents with customs filings via secure audit trail

7. Clear audit trail, data provenance and quicker information availability make it easier to avoid problems, but also aids in diagnosing and correcting them when they occur

TRUCKING PAIN-POINTS

PAIN POINTS

1. Long and unpredictable waiting time to pick up or drop off cargo (e.g. long queueing at marine terminal gate for a drayage firm due to gate flow imbalance)

2. Extra dry runs, empty equipment moves, or deadhead miles due to changing conditions or inaccurate info from other ecosystem members such as BCO's, ocean carriers, or terminals, e.g. Marine terminals and carriers direct the return of empty equipment (containers and chassis) to different locations often via an EOD email communication, causing delays and inefficiencies

3. High customer service costs and administration efforts due to manual and complex tracking and reporting activities

4. Disputes of detention and demurrage and error-prone validation steps

5. Difficulties identifying root causes of shipment exceptions lead to finger pointing

BENEFITS

1. Increase asset turn time and revenue by reducing waiting time via a better yard/terminal capacity planning driven by the real-time event sharing (e.g. confirmation of vessel actual time of arrivals)

2. Reduces non-revenue trips by getting up-to-date and consistent data from BCOs, ocean carriers, freight forwarders, and terminals

3. Common, end-to-end platform provides a single, standard source for supply chain visibility event data

4. Full, trusted visibility on the end-to-end journey of a shipment will decrease inland transportation provider's efforts to validate fees and surcharges and gain shippers' trust

5. Clear audit trail and data provenance makes it easier to avoid problems, but also aids in diagnosing and correcting them when they occur

RAIL PAIN-POINTS

PAIN POINTS

1. Documentation and information volume is not only vast but it is shared in a number of different mediums (EDI transactions, emails, spreadsheets, physical paper) making it extremely time consuming

2. Key documents and events are often only made available once the container arrives, increasing delays if there is conflicting or erroneous information within documents

3. Increased uncertainty among each step of the supply chain makes it difficult to provide adequate visibility and traceability to network members

4. Border cross-over and customs approval process is often manual and extremely time consuming

5. There is not a single source of the truth, creating disputes among network members

6. Customer lacks true end-to-end visibility of the container and information communication is manual and complex

BENEFITS

1. Easily digestible event information collected from a number of different systems in a variety of different formats

2. Immediately available documentation and event information can raise red flags instantaneously when erroneous information has been shared, decreasing processing time

3. A single platform with complete information shared across the entire network provides visibility to the end-to-end supply chain

4. Digital documentation and approval process reduces the complexity of the process, eliminates easily misplaced physical documents, increases security and reduces time required

5. Immutable, auditable and immediately available documentation in a single platform increases trust and ease of doing business

6. A common, end-to-end platform provides a single, standard source for supply chain visibility event data

CARRIERS PAIN-POINTS

PAIN POINTS

1. Time-consuming and expensive integrations limit the connection with supply chain actors e.g. terminals, depots, inland carriers, feeder/barge operators and 3PLs

2. Carriers do not have full visibility and real time access to end-to-end shipment events

3. Carrier deliver different kind of events (equipment, vessel, administrative) to their customers today via different interfaces and channels, handle high volume of customer service calls today for basic inquiries

4. Revenue leakage due to lack of clarity regarding responsibility for Demurrage and Detention or late document/information submission leading to unnecessary waivers or reductions

5. Mis-declared cargo, especially the Dangerous Cargoes

6. Hard to predict the bookings no-show, impact carrier vessel utilization and unit cost

BENEFITS

1. Messages to terminals communicated on a network basis, reducing the cost of integrating and supporting individual terminals, depots and inland carriers, increasing flexibility when it comes to choosing / connecting new providers

2. Connecting to TradeLens platform, carriers will be able to exchange more complete and granular events real time for the shipments including events directly from shipper, intermodal, customs and 3PLs

3. Streamline the delivery of events by using one standardized interface to the platform. No additional integrations with carrier's customers internal systems are necessary. Supporting Carriers e-solution platform allows customers to self-serve for track & trace or subscribing events into in-house system. This will reduce track & track phone calls and email burden on customer service agents by 20% or more and focus resource on higher-value services instead

4. Digital audit trail and full visibility of shipment events makes documenting charges easier, simplifies compliance with regulatory audits, and reduces staff time managing disputes which are reduced or eliminated

5. Audit trail and immutable records of source documents (packing list, commercial invoice) deter mis-declaration of goods, increasing safety and improving revenue accuracy

6. With shippers and forwarders connecting and sending events to TradeLens , carriers will be able to see activities happening before the empty container pickup and have better estimation on the show-up ratio therefore adjust booking acceptance policy accordingly

BANKS PAIN-POINTS

PAIN POINTS

1. Information received manually from clients and in non-standardized formats

2. Delays in validating financing conditions due to data discrepancies in the information received from different stakeholders

3. Critical information is sometimes lost and it is difficult to keep a good track record of historical information

4. Shallow pool of supply chain data limits risk assessment capabilities

5. Paper-based Bills of Lading are costly and inefficient to manage, and vulnerable to bad actors

BENEFITS

1. Substantially reduce clerical activity by eliminating re-keying of data by multiple parties and automating data exchanges

2. All parties share the same version of all required information ensuring data consistency. This enables streamlining of business processes.

3. Information captured on the TradeLens blockchain is immutable and permanently available allowing for better risk analytics and business intelligence

4. Access to event data allows for trend analysis across the network enabling the risk assessment process.

5. TradeLens is taking advice from the industry on a Blockchain-enabled eBill of Lading solution, reducing the risk of fraud and increasing speed and flexibility for cargo owners

Location	Market share (2016)
Los Angeles, CA	21.6%
Long Beach, CA	16.4%
New York / Newark	15.1%
Savannah, GA	8%
Norfolk, VA	5.5%
Tacoma, WA	4.5%
Charleston, SC	4.2%
Houston, TX	4.2%
Oakland, CA	4.1%
Seattle, WA	2.5%

Location	Million TEU (2016)
Shanghai, China	37.13
Singapore	30.90
Shenzhen, China	23.97
Ningbo- Zhoushan, China	21.60
Busan, South Korea	19.85
Hong Kong, China	19.81
Guangzhou Harbor, China	18.85
Qingdao, China	18.01
Dubai, UAE	15.73
Tianjin, China	14.49

APL, AB InBev, Accenture, Keuhne + Nagel

Hyundai Merchant Marine and Samsung SDS

Startups:
   Blockshipping

   CargoX

   ShipChain

   300Cubits

The sole distinction between public and private blockchain is related to who is allowed to participate in the network, execute the consensus protocol and maintain the shared ledger.

A public blockchain network is completely open and anyone can join and participate in the network.

A private blockchain network requires an invitation and must be validated by either the network starter or by a set of rules put in place by the network starter. This places restrictions on who is allowed to participate in the network, and only in certain transactions. The access control mechanism could vary: existing participants could decide future entrants; a regulatory authority could issue licenses for participation; or a consortium could make the decisions instead.

The value of freight moved is forecasted to increase faster than the weight, rising from $1,044 per ton in 2012 to $1,461 per ton in 2045, when controlling for inflation.

This increase is due to high value, low-weight commodities growing at a faster rate than low-value, high-weight commodities. Exports at $1,772 per ton and imports at $1,941 per ton were higher than domestic shipments of $934 per ton in 2012.

Exports and imports accounted for 11.8 percent of the tons and 21.1 percent of the value in 2012 and are projected to make up an even greater share of freight moving throughout the United States, reaching 17.5 percent of the tonnage and 39.3 percent of the value by 2045.