

All Aboard: Shipping With Blockchain



THE NORTHWEST
SEAPORT ALLIANCE

Erik Nielsen
Keaton Layman
Christopher Beardsley



Overview



**Blockchain
Benefits**



**Market
Analysis**



Recommendation

Blockchain Benefits





Blockchain Market and Success



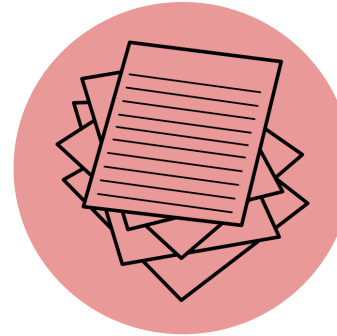
**Connected
Industry**



Blockchain Market and Success



**Connected
Industry**



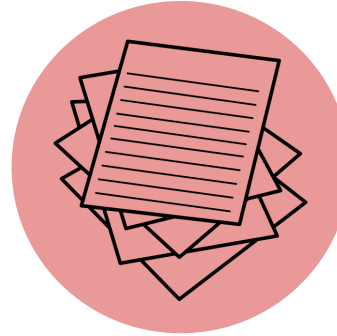
**Digitalizes
Paperwork**



Blockchain Market and Success



**Connected
Industry**



**Digitalizes
Paperwork**



Saves Money

Market Analysis



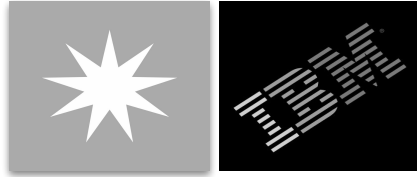
Industry Projects

TRADE+LENS



Industry Projects

TRADE+LENS

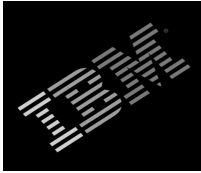


Global Shipping Business Network



Industry Projects

TRADE+LENS



Global Shipping Business Network

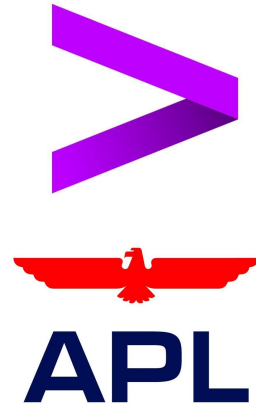
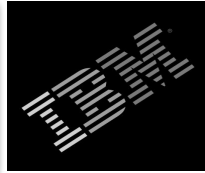


CargoSmart.ai

ORACLE®



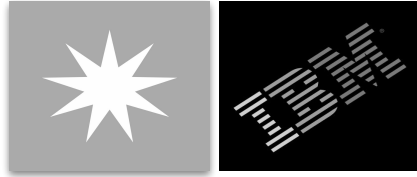
Industry Projects



Global Shipping Business Network



Industry Projects

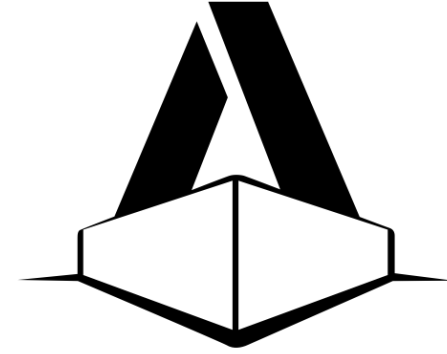


Global Shipping Business Network



Outsider Startups

Cargox



GSCP™

Global Shared
Container Platform





- Developed by Maersk and IBM
- Worldwide Cloud for Shipping Information
- Connects the Entire Industry with a Secure Private BlockChain



TradeLens SWOT Analysis

Strengths:

- Ready to Implement
- Massive Database
- Subscription Based

Opportunities:

- Universal Growth Potential



Weaknesses:

- Small Market Share

Threats:

- Governing Bodies
- Industry Lack of Trust
- Many Competitors

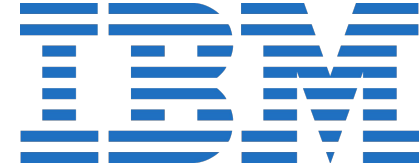


Maersk and IBM Incentives



MAERSK

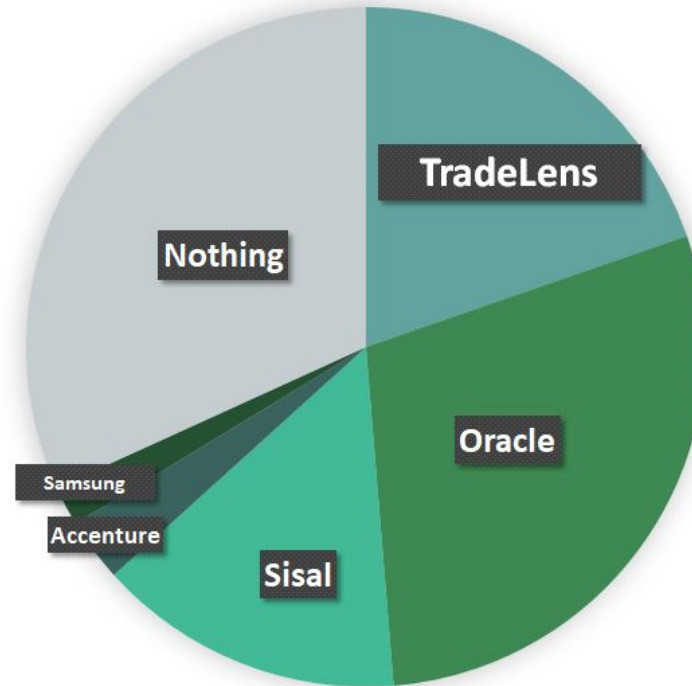
- Universal Blockchain platform in the shipping industry
- More data



- Ownership
- Subscription Bases Profiting



Shipping Market Share by Blockchain Project





Decision Methodology

	<i>Weight</i>	TradeLens	Oracle	Accenture	Wait
Savings	0.3	7	6	5	0
Cost	0.2	5	3	3	8
Integration	0.15	5	4	3	8
Risk	0.35	3	4	2	9
Total Score		4.9	4.4	3.25	5.95



Financial Analysis



Invest Now:
(High Risk)

- Non-Universal (3%)
- \$750,000 Initial Investment
- Cost: \$100,000 Per Year

NPV = \$5.2 Million
(10 Years)



Financial Analysis



Invest Now: *(High Risk)*

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- \$750,000 Initial Investment
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NPV = \$5.2 Million
(10 Years)

Invest Later: *(Low Risk)*

- 10% Annual Operations Savings
- \$750,000 Initial Investment
- Cost: \$100,000 Per Year

NPV = \$6.5 Million
(5 Years)



Financial Analysis

1

Invest Now:
(High Risk)

- Non-Universal (3%)
 - \$750,000 Initial Investment
 - Cost: \$100,000 Per Year
- NPV = \$5.2 Million**
(10 Years)

2

Invest Later:
(Low Risk)

- 10% Annual Operations Savings
 - \$750,000 Initial Investment
 - Cost: \$100,000 Per Year
- NPV = \$6.5 Million**
(5 Years)

3

Compare:

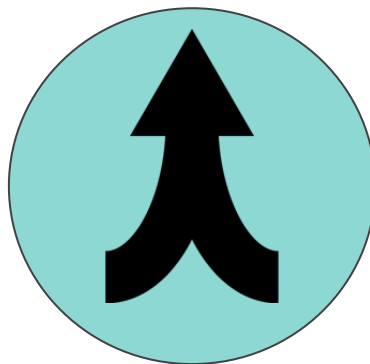
- 6.5 - 5.2 = \$1.3 Million + Mitigated Risk**
- Invest Later

Recommendation





Universal Standard Needed





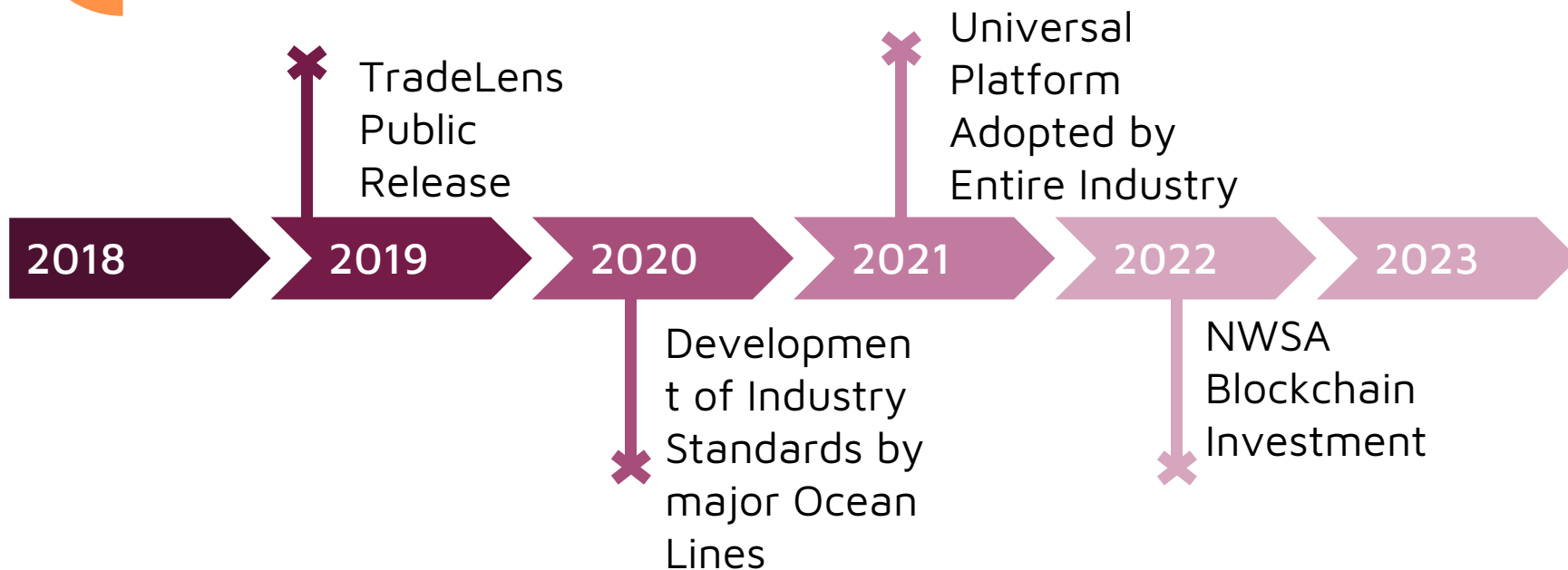
TradeLens Recap

TRADE+
LENS

- Lack of Current Participation
- Lower Chance of Success in the Future



Going Forward

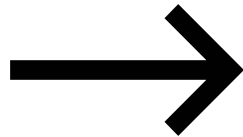




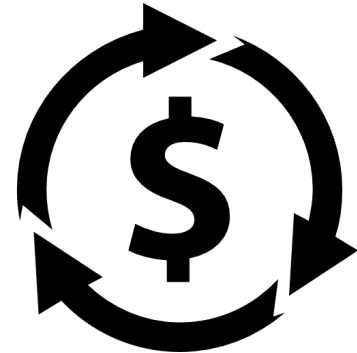
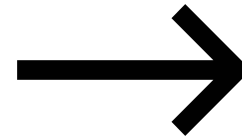
Patience is a Virtue



Wait



Observe



Invest

Appendix

Global
Shipping
Alliances

Percent Share
in Blockchain

Global
Shipping
Leaders

NPV
Calculations

TradeLens
Will Not Win

INTRA

Risk

TradeLens
Prescriptions

Alternatives

Accenture

Samsung SDS

United
Nations

Distrust of
TradeLens

Cargo X

Ship Chain

Industry
Options

Blockchain
Future

ORACLE

Port of Long
Beach

Port of
Oakland

US
Government

Standards
Organizations

BITA

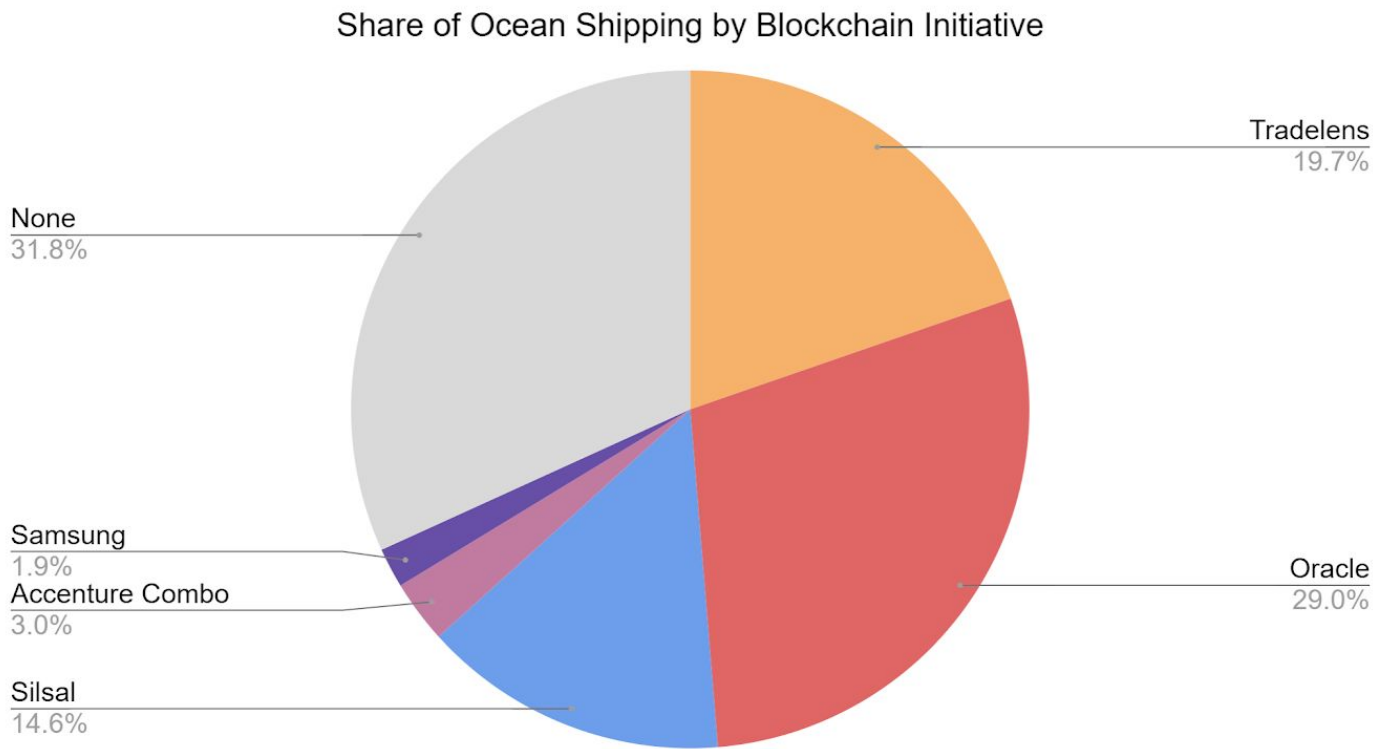
NWSA GOALS



Global Shipping Alliances

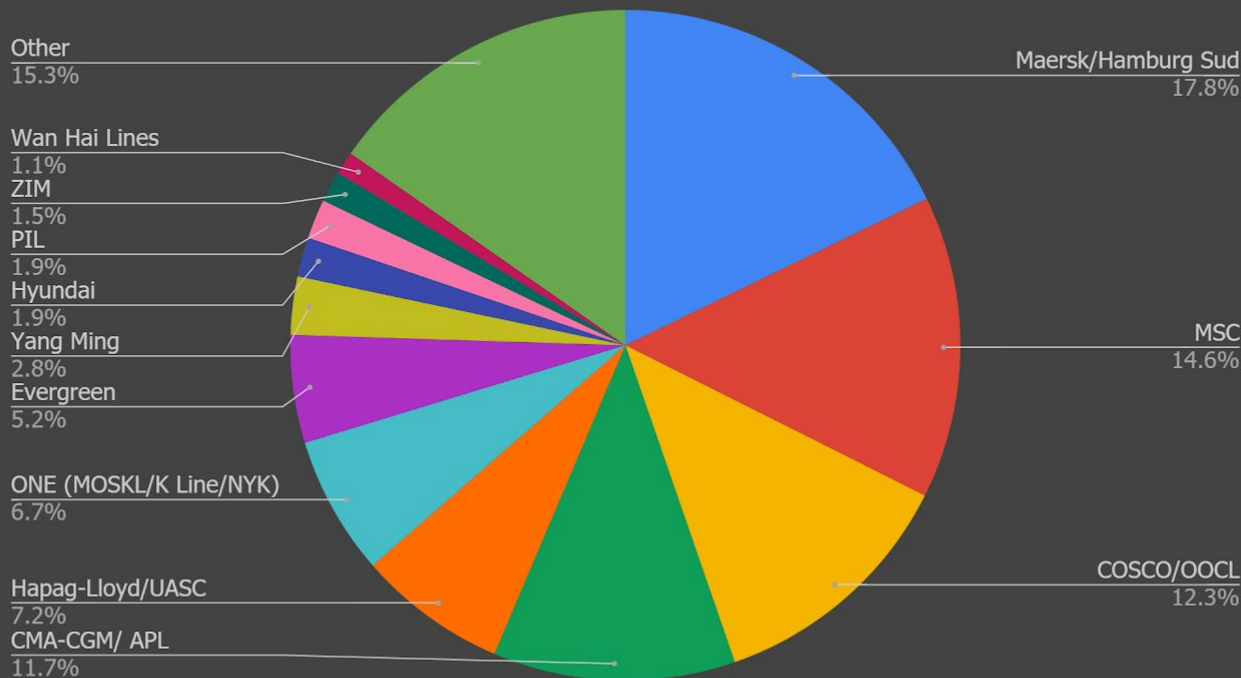
Ocean Line	Alliance	Percent Market Share
Maersk/Hamburg Sud	2M+H	34.3
MSC	2M+H	34.3
COSCO/OOCL	Ocean Alliance	29.2
CMA-CGM/ APL	Ocean Alliance	29.2
Hapag-Lloyd/UASC	The Alliance	16.7
ONE (MOSKL/K Line/NYK)	The Alliance	16.7
Evergreen	Ocean Alliance	29.2
Yang Ming	The Alliance	16.7
Hyundai	2M+H	34.3
Other		19.8
Total		100

Percent Shares in Each Blockchain



Global Shipping Leaders

Percent Market Share

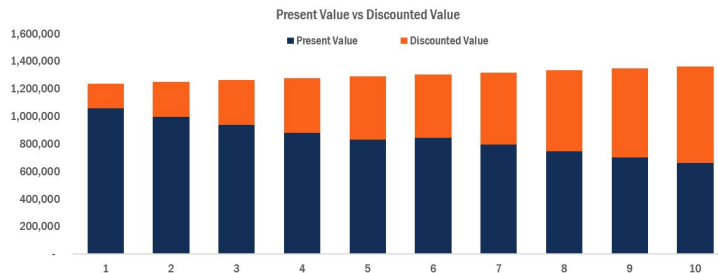


Ocean Line	Percent Market Share
Maersk/Hamburg Sud	17.8
MSC	14.6
COSCO/OOCL	12.3
CMA-CGM/ APL	11.7
Hapag-Lloyd/UASC	7.2
ONE (MOSKL/K Line/NYK)	6.7
Evergreen	5.2
Yang Ming	2.8
Hyundai	1.9
PIL	1.9
ZIM	1.5
Wan Hai Lines	1.1
Other	15.3
Total	100



NPV Calculations (Invest Now)

Net Present Value										
Discount Rate	7.5%			Initial Investment \$ 750,000.00						
Year	1	2	3	4	5	6	7	8	9	10
Discount Factor	0.93	0.87	0.80	0.75	0.70	0.65	0.60	0.56	0.52	0.49
Undiscounted Cash Flow	1,237,129	1,250,400	1,263,812	1,277,368	1,291,070	1,304,919	1,318,916	1,333,064	1,347,363	1,361,816
Undiscounted Subscription Cost	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Present Value	1,057,795	995,478	936,823	881,614	829,650	794,983	747,452	702,762	660,745	
Discounted Total Future Cash Flow:	5,970,865			Net Present Value \$ 5,220,865.47						
Discounted Value	179,335	254,921	326,989	395,754	461,420	459,382	523,933	585,612	644,601	701,071





NPV Calculations (Invest Now)

		(Projected)											
Operation Expenses (In Thousands):		Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10		
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
	40367	40800	41237.64461	41679.98365	42127.06748	42578.94699	43035.67363	43497.29938	43963.8768	44435.459	44912.09966	45393.85305	
Undiscounted Subscription Cost			100000	100000	100000	100000	100000	100000	100000	100000	100000	100000	
Annual Operation Expenses Growth:	0.01073												
Annual Operation Expenses Savings Rate from Blockchain:	0.03												
Undiscounted Cash Flows:			1237129.338	1250399.51	1263812	1277368.41	1291070.21	1304918.981	1318916.3	1333063.77	1347362.99	1361815.592	

"The cost of all that documentation could be as high as 20% of the overall cost of the physical transportation" - CEO of TradeLens (White)

STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION

Year Ended December 31, 2017 and 2016. (Dollars in Thousands)

	2017	2016
OPERATING REVENUES		
Property rentals	\$ 194,985	\$ 195,170
Total operating revenues	194,985	195,170
OPERATING EXPENSES		
Operations	40,800	40,367
Maintenance	17,529	14,392
Administration	19,560	18,317
Security	4,235	4,231
Environmental	1,391	2,225
Total before depreciation	83,715	79,732
Depreciation	2,180	532
Total operating expenses	85,895	80,264
Operating income	109,090	114,906
NON-OPERATING REVENUES (EXPENSES)		
Interest income	777	795
Net decrease in the fair value of investments	(40)	(328)
Other non-operating expenses, net	(297)	2,835
Total non-operating income, net	437	4,262
Increase in net position, before capital contributions	109,527	123,168
Capital grant contributions	324	—
Increase in net position before Managing Members contributions and distributions	109,851	123,168
Net position before Managing Members contributions and distributions	\$ 109,851	\$ 123,168
Working capital contributions	—	\$1,000
Capital contribution contributions	69,139	72,893
Distributions to Managing Members	(102,580)	(115,964)
Total Managing Member investment	(33,460)	7,969
Beginning of year	131,137	—
Net position, end of year	\$ 207,528	\$ 131,137

See notes to financial statements.



Sensitivity net pension liability to changes in the discount rate

The table below presents the net pension liability of employers, calculated using the discount rate of 7.50 percent as well as what employers' net pension liability would be if it were calculated using a discount rate 1 percentage point lower (6.5 percent) or 1 percentage point higher (8.5 percent) than the current rate (dollars in thousands).

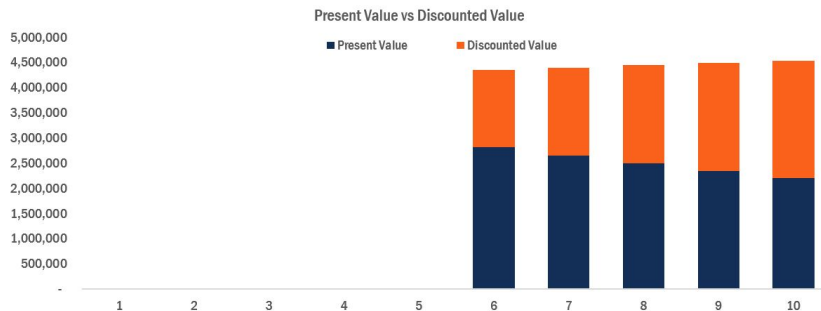
December 31, 2017:	Pension Trust	1% Decrease	Discount Rate	1% Increase
Discount rate		6.50%	7.50%	8.50%
Proportionate share of net pension liability	PERS 1	\$1,332	\$1,093	\$ 887
Proportionate share of net pension liability/ (asset)	PERS 2/3	2,774	1,030	(400)

Detailed information about the pension plan's fiduciary net position is available in the separately issued DRS financial reports. Additional actuarial and pension plan information is included in the DRS 2017 Comprehensive Annual Financial Report (CAFR), including descriptions of actuarial data, assumptions, methods, and plan provisions relied on for the preparation of GASB 67 and GASB 68. Additional details regarding this information is included in OSA's 2015 Report on Financial Condition and Economic Experience Study on the OSA website.



NPV Calculations (Invest Later)

Net Present Value										
Discount Rate	7.5%			Initial Investment	\$ 750,000.00					
				Discounted	\$ 561,600.40					
Year	1	2	3	4	5	6	7	8	9	10
Discount Factor	0.93	0.87	0.80	0.75	0.70	0.65	0.60	0.56	0.52	0.49
Undiscounted Cash Flow	-	-	-	-	-	4,349,730	4,396,388	4,443,546	4,491,210	4,539,385
Undiscounted Subscription Cost	0	0	0	0	0	100000	100000	100000	100000	100000
Present Value	-	-	-	-	-	2,818,458	2,649,944	2,491,506	2,342,541	2,202,482
Discounted Total Future Cash Flow: 7,110,974			Net Present Value \$ 6,549,373.18							
Discounted Value	-	-	-	-	-	1,531,272	1,746,443	1,952,040	2,148,669	2,336,903





NPV Calculations (Invest Later)

Operation Expenses (In Thousands):	(Projected)											
	2016	2017	Period 1 2018	Period 2 2019	Period 3 2020	Period 4 2021	Period 5 2022	Period 6 2023	Period 7 2024	Period 8 2025	Period 9 2026	Period 10 2027
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			0	0	0	0	0	100000	100000	100000	100000	100000
Annual Operation Expenses Growth:		0.01073										
Annual Operation Expenses Savings Rate from Blockchain:		0.1										
Undiscounted Cash Flows:			0	0	0	0	0	4349729.938	4396387.68	4443545.9	4491209.966	4539385.305

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NPV Calculations (Initial Investment)

Initial Investment: Port of Seattle + Port of Tacoma

650,000 + 75833 =

725833

Conservative Estimate: \$750,000

Industrial Hygiene Monitoring Consulting Services				89,804
High Performance Organization - 2018 Budget Requests		2.5	476,162	188,319
Other Portwide Business Needs				
Community Outreach	Annual "State of the Port" Breakfast to inform stakeholders of key Port issues		25,000	
	Portwide Stakeholder database		80,000	
	Environmental Justice Near Port Communities Projects		25,000	
	Association of Washington Businesses (AWB) Event Sponsorship		45,000	
Accountability/Transparency	Conduct 2 Outsourced Information Technology Audits in 2018			190,000
	Peer Review - Association of Local Government Auditors			15,000
	Senior Internal Auditor	1.0	146,018	4,970
Payment Card Industry (PCI) Compliance/Network Security	Automated Data Discovery Tool (PCI compliance)		45,000	
	Managed Services (Network Monitoring)		55,000	
	Vulnerability Management Software		30,000	
	Contractor support for risk assessment Threat and Hazard Identification and Risk Assessment			60,000
Continued Process Improvement	Microsoft Consulting Services with the InfoSec Team		10,000	
	Lean Consulting Services/ Training Materials/Professional Development		24,600	624,775
	Business Intelligence Performance Measurement training			28,000
Business Intelligence Analytical support services			45,000	
Other Portwide Business Needs - 2018 Budget Requests		1.0	530,618	922,745

Port of Seattle 2018 Budgeted Revenue: 670 million

8.57142857

75833.33333

Port of Tacoma 2018 Budgeted Revenue: 70 million



Why Tradelens will not win

- Too much competition in the Market
- They are the biggest Competition to the other companies
- Not enough transparency





Risk





Tradelens Prescriptions

Subscribing to Events

The TradeLens platform provides several types of event subscriptions:

- **Port:** subscribes to all events for a specific port of call. This includes all events originating, passing through, and arriving at the port.
- **Country:** subscribes to all events for a specific country. This includes all events originating, passing through, and arriving at the country.
- **Organization:** subscribes to all events that are determined to be associated with the organization.
- **Terminal:** subscribes to all events that pass through a specific terminal.
- **Delegation ID:** subscribes to either import events, export events, or all events for a specific shipment or container. The delegation IDs are returned on the "E468 Start Shipment Tracking" and "E278 Start Container Tracking" events and the appropriate one (import, export, all) is used to set up the subscription.



Alternatives

Cloud Computing

(add in the large cloud computing company succeeding in this industry

The only risk we can see from waiting is losing out on a potentially earlier investment with a possible winner, but it is safer to wait.

Investigate what other ports are doing, like NWSA!!

Could we lose business if someone else successfully uses it and we don't?



Accenture

APL and Accenture said they plan to pilot their product by the end of this year. Accenture said it has tested its technology with other pilot shipments that range from beer to medical supplies.

APL Ltd., owned by the world's third-largest container line CMA CGM SA, together with Anheuser-Busch InBev NV, Accenture, and freight forwarding giant Kuehne + Nagel

<https://www.accenture.com/us-en/insights/blockchain/industrial-blockchain-freight-logistics>

<https://www.bloomberg.com/news/articles/2018-04-18/drowning-in-a-sea-of-paper-world-s-biggest-ships-look-for-a-way-out>



Samsung SDS

South Korea's Hyundai Merchant Marine Co. held trial runs last year using a system developed with Samsung SDS Co.

the Port of Rotterdam, has partnered with major Dutch bank ABN AMRO and the IT subsidiary of Samsung

the infrastructure behind the project was developed by BlockLab – a Dutch company established by Port of Rotterdam Authority. It will also involve two other decentralized platforms – Samsung's Nexledger, created back in 2017, and Corda, an open-source blockchain platform launched by enterprise software firm R3.

<https://www.samsungds.com/global/en/about/news/blockchain-based-maritime-logistics-project.html>

<https://cointelegraph.com/news/europes-largest-port-partners-with-samsung-it-subsidary-to-test-blockchain-for-shipping>



Distrust of TradeLens

"Without a joint solution, we're going to waste a lot of money, and that would benefit no one." - Hapag-Lloyd CEO

a digital solution in which the 5-7 biggest liner companies develop joint platform is the only realistic way forward for the container sector.

"I won't mince words here – we do need to get the other carriers on the platform. Without that network, we don't have a product. That is the reality of the situation." - Head of Tradelens

"We are not going to invest in something that is some company's baby that they have exclusive copyright on and [that] will be a closed system. We need to have an open system." - ONE CEO

the platform has only managed to get one carrier outside the Maersk Group — Pacific International Lines (PIL) — to join

<https://shippingwatch.com/carriers/Container/article10602520.ece>

<https://www.coindesk.com/ibm-blockchain-maersk-shipping-struggling>



Cargo X

The CargoX platform is based on the CargoX's Blockchain Document Transaction System technology. It allows companies to create, transfer, and state ownership of information and the various types of freight shipping documents.

Shipping, freight forwarding, NVOCC, exporting and importing companies, forwarder alliances and networks providing solutions for logistics and supply chains all over the world can join to use the CargoX platform.

CargoX pointed out that users need not implement any new infrastructure. The systems stores documents and data securely encrypted on a public globally accessible blockchain network.

<http://www.seatrade-maritime.com/news/asia/cargox-launches-blockchain-platform-for-ship-ping.html>



ShipChain

There really isn't much to gain for an enterprise by using private or permissioned blockchain systems, due to the lack of inherent trust in them — they could just as well use a centralized database, as it would behave the same. A public blockchain, with its incentive mechanisms such as tokens, truly fosters the trust of the ecosystem without having to trust all of the players involved. - CEO of ShipChain

https://www.joc.com/technology/blockchain-and-container-shipping-just-beginning-get-know-one-another_20180728.html



Industry Opinions

50% reported real-time container visibility as a top concern of freight forwarders

91% said the creation of agreed standards and protocols is essential

82% said standards should be done by a neutral party

EDI and API scored the highest, blockchain the lowest on standards that will help shipping the most

<https://www.inttra.com/newsroom/inttra-technology-summit-enabling-collaboration-across-the-container-shipping-industry/>



Blockchain Future

“Through 2020, 90 percent of the blockchain initiatives in supply chain are going to be the proof of concept variety,” said Andrew McLoone, director of operations at the third-party logistics provider (3PL) BDP International, said at the JOC Logistics Technology Conference on a panel about using the technology for ocean bill of lading production. “When people talk about it, they talk about visibility and the ability to reduce paper trade. When it comes to visibility, we’re not sure blockchain is the accelerator. [Artificial intelligence] and machine learning are more likely opportunities. But when we talk about documentation, we do think there are opportunities when you look at how blockchain allows you to transfer cryptocurrency among partners.”



Port of Long Beach

GE Port Optimizer at Long Beach

GE Transportation and the Port of Long Beach have recently completed a three-month technology pilot to improve cargo flow. [They showed] 14+ days faster access to information, improved turn times while increasing throughput, more productive turns, and all leading to increased supply chain performance.

Port Optimizer™ is cloud-based software that enhances supply chain performance and predictability by delivering real time data-driven insights through a single portal to stakeholders across the supply chain. Integrating data from across the port, combining machine learning and deep domain expertise, it helps the supply chain monitor and respond to dynamic conditions, align people and resources, and proactively communicate across functions – enabling maximum port cargo flow and delivery performance.

<https://getransportation.com/port-long-beach-launches-data-sharing-project-ge-transportation-improve-cargo-flow-efficiencies>



Port of Oakland

The port has stated that it will be building an online portal for transactions dealing with tracking and transporting containerized cargo. The Port will be working with New Jersey-based logistics software provider Advent Intermodal Solutions LLC, whose eModal port community system is already in use by terminal operators at Oakland, to develop the portal.

Development of the portal is already in progress, with a projected launch date in the third-quarter 2018.

https://www.porttechnology.org/news/port_of_oakland_building_digital_shipping_platform



US Government

Federal Maritime Commission commissioner Rebecca Dye recently convened 3 teams of 34 supply chain experts to advise on recommendations for operational challenges

The result was unanimous among the groups, which called for the creation of a detailed national portal that would share critical data and further supply chain visibility. Collected data could reflect container, chassis and dray truck availability.

<https://www.supplychaindive.com/news/port-data-visibility-dwell-time-fmc/431904/>

Standards Organization



A.P. Moller – Maersk, CMA CGM, Hapag-Lloyd, MSC and Ocean Network Express plan to establish container shipping association

15th November 2018 – Singapore – *Ocean Network Express announces that five container shipping companies intend to create an association with the purpose of paving the way for digitalization, standardization and interoperability in the container shipping industry.*

IT executives from A.P. Moller – Maersk, CMA CGM, Hapag-Lloyd, MSC and Ocean Network Express are currently discussing the creation of common information technology standards which shall be openly available and free of charge for all stakeholders of the wider container shipping industry.

"It's in the customers' and all stakeholders' best interest, if container shipping companies operate with a common set of information technology standards", says André Simha, CIO of MSC and spokesperson of the group.

"We are striving for less red tape and better transparency. The timing is right, as emerging technologies create new customer friendly opportunities. Together, we gain traction in delivering technological breakthroughs and services to our customers compared to working in our own closed silos", he adds.

A need for a neutral and non-profit association

Whilst the shipping industry already has multiple organizations and associations, the members of the group identified a need for a neutral and non-profit body for ocean carriers that is driven by delivering benefits for the industry and its stakeholders.

"That is why we will also welcome new members with open arms to join the association", Simha concludes.

The association has no intent of developing or operating any digital platform, but aims to ensure interoperability through standardization. Similarly, the association will not discuss any commercial or operational matters.



BiTA

the Blockchain In Transport Alliance (BiTA), has quickly grown into the largest commercial blockchain alliance in the world, with nearly 500 members in over 25 countries that collectively generate over \$1 trillion in revenue annually.

BiTA is a member-driven organization; members are primarily from the freight, transportation, logistics and affiliated industries. Alliance members share a common mission of driving the adoption of emerging technology forward. We accomplish this by developing industry standards; educating members and others on blockchain applications/solutions and distributed ledger technology (DLT); and encouraging the use and adoption of new solutions.

<https://www.bitastudio/>



INTTRA

The container shipping industry digitalization drive has shown signs of stalling in the last few years. INTTRA has previously tried to drive standards adoption across individual carriers in the container shipping industry, notably around creating a standardized bill of lading format and carrier invoicing. Those efforts never got off the ground and INTTRA, like other software companies in the industry, has focused on normalizing data within its own systems rather than developing industry standards.

https://www.joc.com/maritime-news/container-lines/container-line-group-aims-jolt-slow-going-it-standardization_20181115.html



United Nations (Gov Regulation)

United Nations Centre for Trade Facilitation and Electronic Business

Its principal focus is on facilitating national and international transactions, through the simplification and harmonization of processes, procedures and information flows, and so contributing to the growth of global commerce.

UN/CEFACT [Should] work with national delegations and its experts to establish working groups to progress the following new technical specifications. The establishment of a technical working group to review existing work by standards organizations in order to identify if there is a need to collaborate with them on a possible framework for inter ledger interoperability specifications that would define:

- Standards for on-chain metadata;
- Standards for inter-ledger notarization

<https://uncefact.unece.org/display/uncefactpublicreview/Public+Review%3A+Blockchain+Whitepaper>

<http://www.unece.org/cefact/about.html>



ORACLE

The new consortium, powered by Oracle Cloud Blockchain Service, involves CMA CGM, Cosco Shipping (and subsidiary brand OOCL), Evergreen Marine, and Yang Ming. All but Yang Ming are part of the Ocean Alliance, and collectively those lines deploy roughly one-third of total containership capacity. The terminal operators include DP World, Hutchison Ports, PSA International Pte Ltd, and Shanghai International Port, the largest companies in that industry outside of APM Terminals. CargoSmart, a shipment management software provider, is owned by Cosco.

CargoSmart projects a 65% reduction in the amount of time required to collect, consolidate, and confirm data from multiple parties and to handle shipping data that is repetitive in different documents by leveraging its blockchain shipment documentation solution.

<https://www.cargosmart.com/en/news/cargosmart-launches-blockchain-initiative-to-simplify-shipment-documentation-processes.htm>

<https://blogs.oracle.com/cloud-platform/cargosmart-leads-global-shipping-consortium-formation-built-on-blockchain-technology>



NWSA Goals/Plan

PNW GATEWAY CRITICAL SUCCESS FACTORS



Increased terminal utilization



Productivity enhancements



Rail competitiveness



Infrastructure investment



Regulatory climate



Recent industry changes drive actions to stay competitive



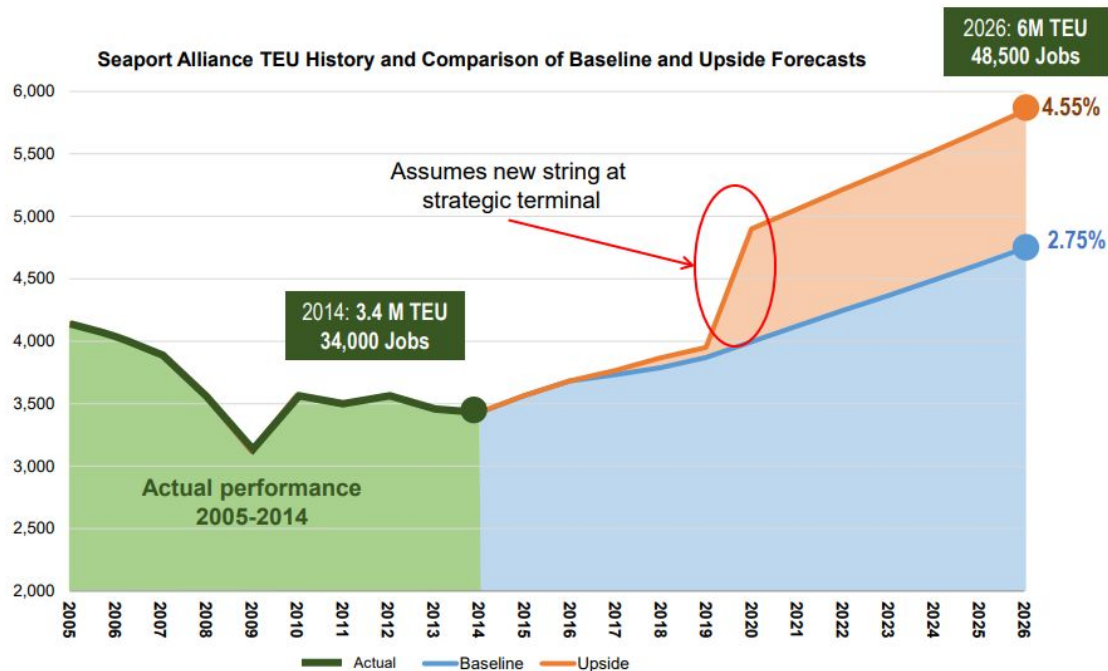
Optimized infrastructure investment strategy



Customer focused solutions to become the gateway of choice

NWSA Growth

CARGO GROWTH GOALS



Port of Seattle Lean Training

Industrial Hygiene Monitoring Consulting Services				57,804
High Performance Organization - 2018 Budget Requests		2.5	476,162	188,319
Other Portwide Business Needs				
Community Outreach	Annual "State of the Port" Breakfast to inform stakeholders of key Port issues		25,000	
	Portwide Stakeholder database		80,000	
	Environmental Justice Near Port Communities Projects		25,000	
	Association of Washington Businesses (AWB) Event Sponsorship		45,000	
Accountability/Transparency	Conduct 2 Outsourced Information Technology Audits in 2018			190,000
	Peer Review - Association of Local Government Auditors			15,000
	Senior Internal Auditor	1.0	146,018	4,970
Payment Card Industry (PCI) Compliance/Network Security	Automated Data Discovery Tool (PCI compliance)		45,000	
	Managed Services (Network Monitoring)		55,000	
	Vulnerability Management Software		30,000	
	Contractor support for risk assessment Threat and Hazard Identification and Risk Assessment			60,000
Continued Process Improvement	Microsoft Consulting Services with the InfoSec Team		10,000	
	Lean Consulting Services/ Training Materials/Professional Development		24,600	624,775
	Business Intelligence Performance Measurement training			28,000
	Business Intelligence Analytical support services		45,000	
Other Portwide Business Needs - 2018 Budget Requests		1.0	530,618	922,745

Greenest & Most Energy-Efficient Port - 2018 Budget Requests		3.0	1,004,106	2,528,240
High Performance Organization (HPO)				
	Port of Seattle Leadership Development Program		125,000	
	HR Communications Consulting Services		75,000	
	HR Benefits Manager - to backfill position for 6 mos.			58,845
	Senior Talent Acquisition Representative	1.0	118,313	6,420
	Executive Office College Intern	0.5	26,640	1,650
	Commission Staff Assistant - Commission Records	1.0	82,159	
	Employee Engagement Survey (Full & Pulse)		33,000	
	Labor Relations Office buildout; Registration for training; Supplies/Software		7,140	31,600
	VR Content Code of Conduct Online Training		8,016	
	Industrial Hygiene Monitoring Consulting Services			89,804