CSCMP'S ANNUAL
STATE OF LOGISTICS REPORT®
AUTHORED BY ATKearney
PRESENTED BY PENSKE Rental | Leasing | Logistics

State of Logistics Report 2018

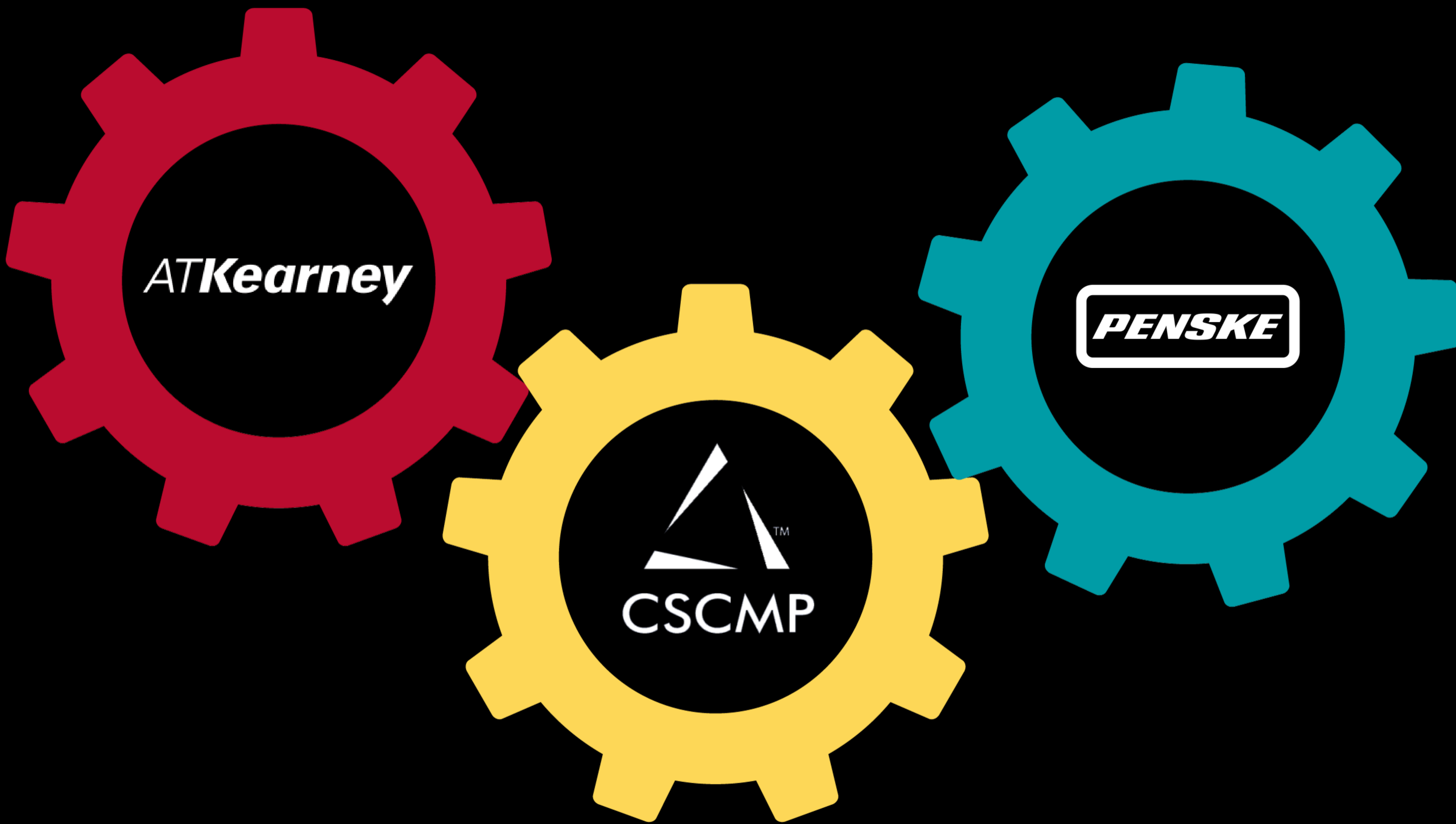
CSCMP Steep Grade Ahead

CSCMP Roundtables

Feb 11, 2019 St. Louis
Feb 13, 2019 Houston

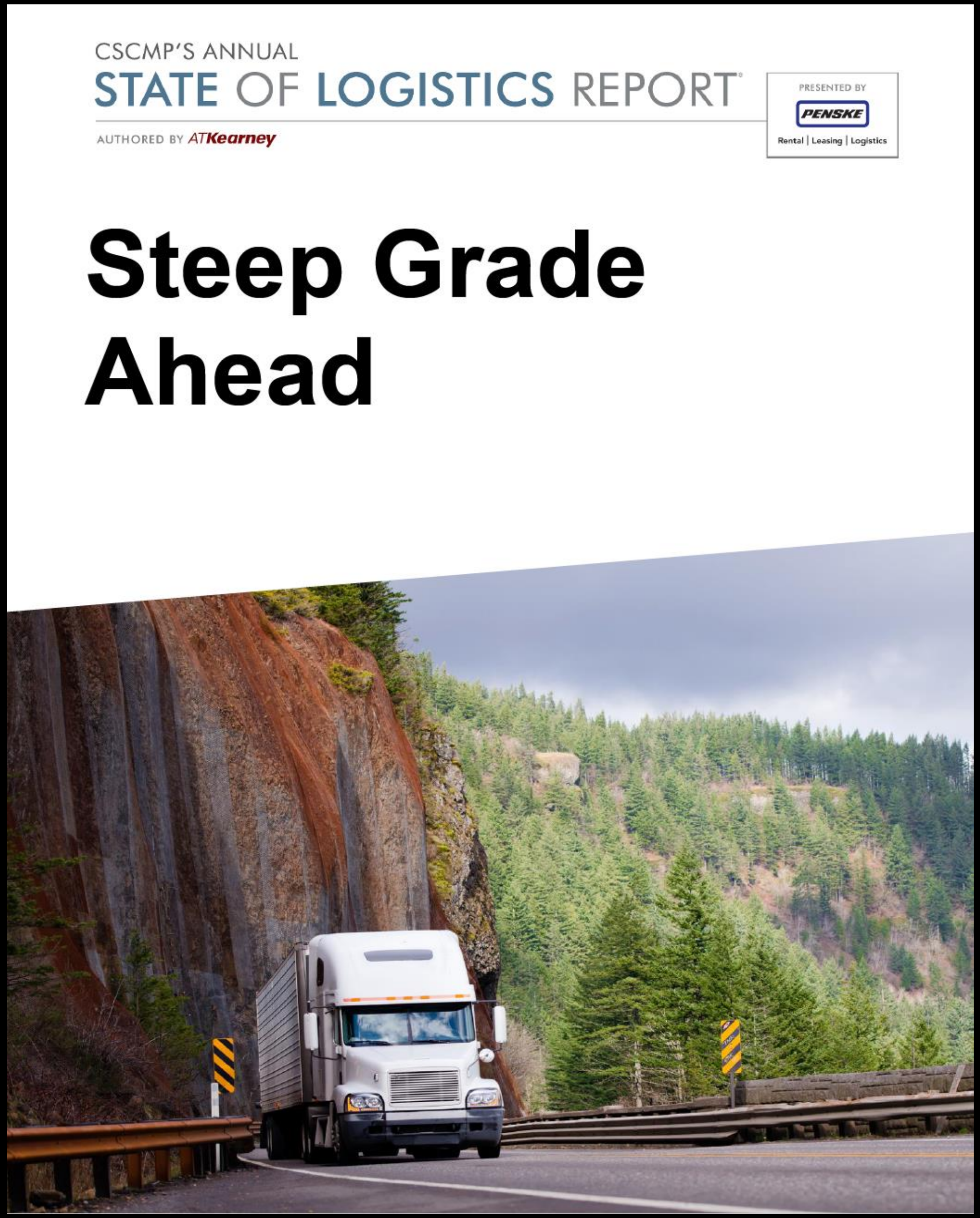
Korhan Acar
A.T. Kearney

A successful collaboration…



A proven approach for the report…

- I Focused economic analysis
- II Interviews with logistics industry leaders
- III Logistics industry context and point of view
- IV Trends and deep dives: global trends, technology, regulation



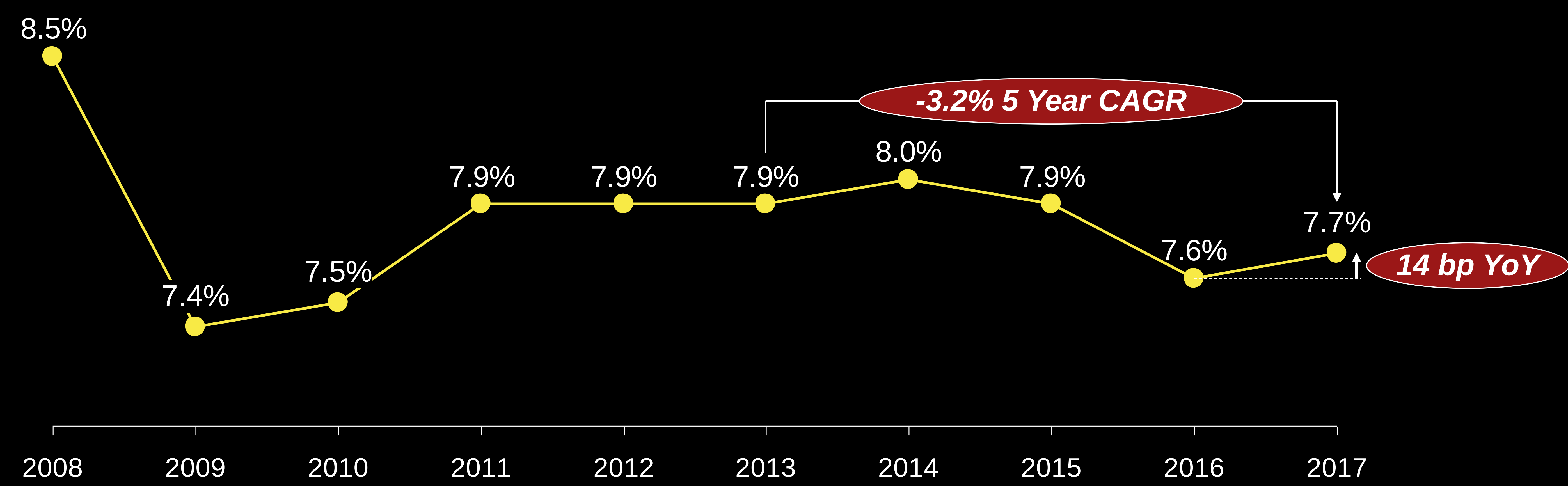
A transparent and consistent estimate of US Business Logistics Costs

$billion	2017	YoY 17/16	5-yr. CAGR
Transportation costs			
Full truckload	289.4	6.4%	4.8%
Less-than-truckload	62.4	6.6%	-2.1%
Private or dedicated	289.6	9.5%	6.8%
Motor carriers	641.4	7.8%	4.8%
Parcel	99.0	7.0%	7.9%
Carload	59.0	7.3%	-0.5%
Intermodal	21.4	10.7%	2.6%
Rail	80.5	8.2%	0.3%
Airfreight (includes domestic, import, export, cargo, and express)	67.2	3.1%	1.5%
Water (includes domestic, import, and export)	41.0	1.1%	-0.4%
Pipeline	36.4	5.8%	5.8%
Subtotal	**965.5**	**7.0%**	**4.2%**
Inventory carrying costs			
Storage	148.0	4.2%	3.1%
Financial cost (WACC x Total Business Inventory)	151.6	5.0%	-1.0%
Other (obsolescence, shrinkage, insurance, handling, others)	128.4	4.6%	0.9%
Subtotal	**428.0**	**4.6%**	**0.9%**
Other costs			
Carriers' support activities	50.5	3.9%	4.8%
Shippers' administrative costs	50.7	6.0%	4.9%
Subtotal	**101.2**	**4.9%**	**4.9%**
Total US business logistics costs	**1,494.7**	**6.2%**	**3.2%**

$billion	Units	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Nominal GDP	$ billion	14,718.6	14,418.7	14,964.4	15,517.9	16,155.3	16,691.5	17,427.6	18,120.7	18,624.5	19,390.6
Total business inventory	$ billion	2,195.5	1,933.4	2,031.5	2,271.0	2,343.8	2,413.3	2,536.7	2,505.8	2,511.5	2,608.7
Inventory carrying rate	%	18.1%	19.2%	18.5%	17.6%	17.5%	17.7%	16.1%	17.0%	16.3%	16.4%
Transportation costs	$ billion	774.3	622.7	681.9	749.3	785.8	809.9	903.4	907.0	902.2	965.5
Inventory carrying costs (ICC)	$ billion	397.3	372.1	375.5	400.1	409.5	427.9	409.0	426.4	409.2	428.0
Other costs	$ billion	74.4	68.7	70.2	74.8	79.7	82.6	89.9	95.3	96.4	101.2
Total USBLC	$ billion	1,246.0	1,063.5	1,127.5	1,224.2	1,275.0	1,320.4	1,402.3	1,428.7	1,407.8	1,494.7
Total USBLC as % of GDP	%	8.5%	7.4%	7.5%	7.9%	7.9%	7.9%	8.0%	7.9%	7.6%	7.7%
Total business inventory as % of GDP	%	2.7%	2.6%	2.5%	2.6%	2.5%	2.6%	2.3%	2.4%	2.2%	2.2%
Transportation as % of GDP	%	5.3%	4.3%	4.6%	4.8%	4.9%	4.9%	5.2%	5.0%	4.8%	5.0%
ICC as % of GDP	%	2.7%	2.6%	2.5%	2.6%	2.5%	2.6%	2.3%	2.4%	2.2%	2.2%
Total business inventory as % of GDP (2010=100)	base 100	104.7	100.1	97.3	100.0	98.3	99.4	91.0	91.3	85.2	85.6
Transportation as % of GDP (2010 = 100)	base 100	109.0	89.4	94.4	100.0	100.7	100.5	107.4	103.7	100.3	103.1
ICC as % of GDP (2010 = 100)	base 100	104.7	100.1	97.3	100.0	98.3	99.4	91.0	91.3	85.2	85.6
Total USBLC as % of GDP (2010 = 100)	base 100	107.3	93.5	95.5	100.0	100.0	100.3	102.0	99.9	95.8	97.7

US Business Logistics Costs (USBLC) increased by 6.2% to ~ $1.5 trillion

USBLC as percent of nominal GDP



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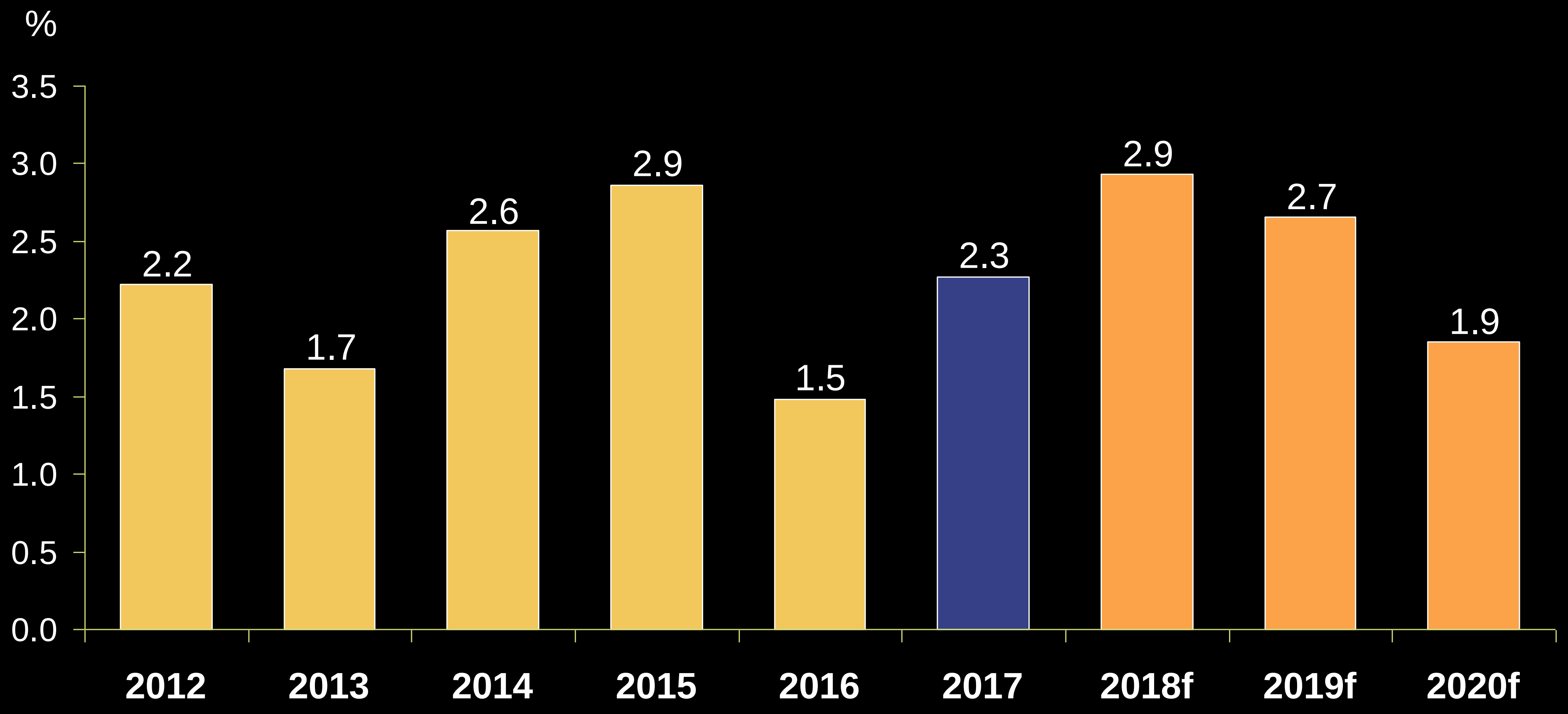
- 2016's expenditure declines in 9 segments turned into increases for all 16 segments in 2017
- Intermodal and private/dedicated fleets had highest jumps
- Parcel increased 7% in 2017, following a strong 10% in 2016
- Water and airfreight saw relatively modest increases
- Inventory costs rose 4.6% in 2017 vs a -3.2% decline in 2016 led by higher inventory and financing costs
- Other costs increased 4.9% in 2017 from a -2.0% decline in 2016 led by administrative costs

Macroeconomics: Robust in near term

US economic growth rates to hover around 2.5%

Real US GDP growth



- At 3.2% the global economy continued to register modest growth, while the US economy grew by 2.3 % in 2017
- In 2018, unemployment rate was 49 year low at 3.7%
- Consumer confidence near 5 year high in late 2018, followed by declines in December and January
- Consumer sentiment drops 7% in Jan 2019, lowest level during Trump administration
- Oil prices hovered around $50 per barrel in 2017, peaked to $80 in 2018 now around $60
- Fed monetary policy continues to seek to balance growth and inflation risk
- Some mixed signals in Dec/Jan but could be due to stock market noise late 2018

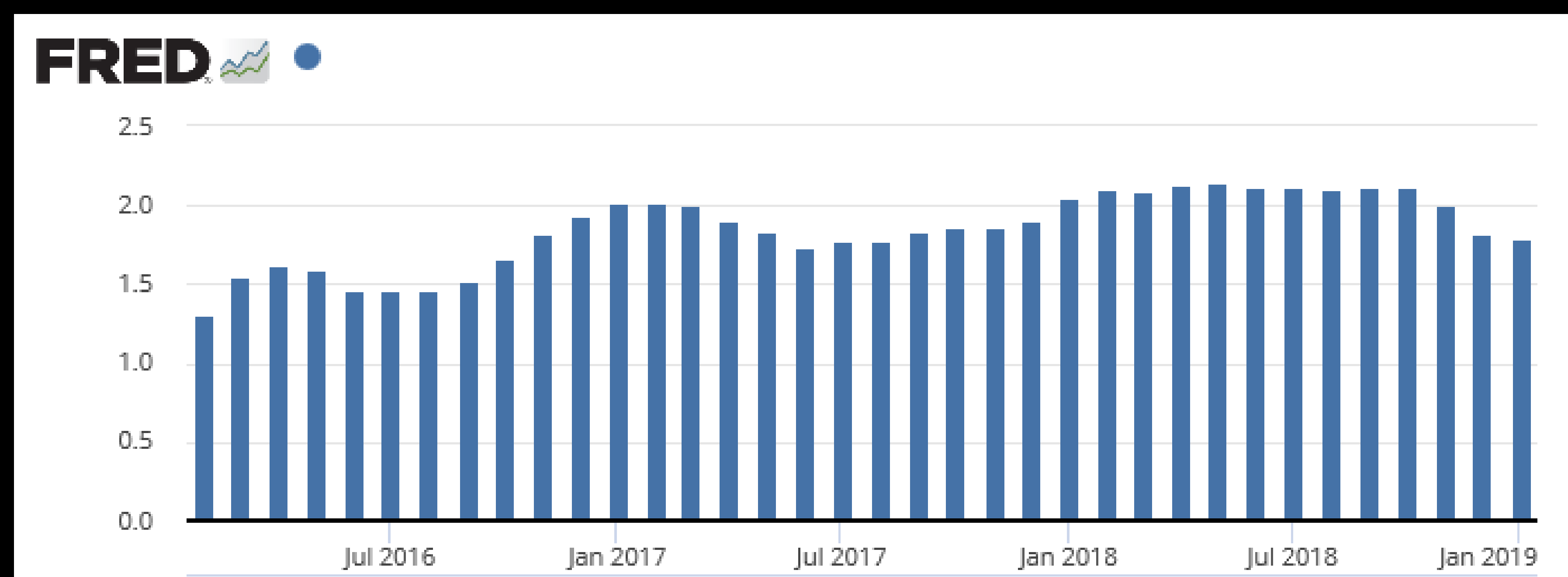
Source: International Monetary Fund World Economic Outlook,

Consumer spending continues with net increases

Consumer spending, the main driver of logistics activity, grew ~4% in 2017 and 2018

Source: BEA Bureau of Economic Analysis

Inflation remains within Fed targets, 1.79% in Jan 2019, should be in close watch after historical lows in unemployment

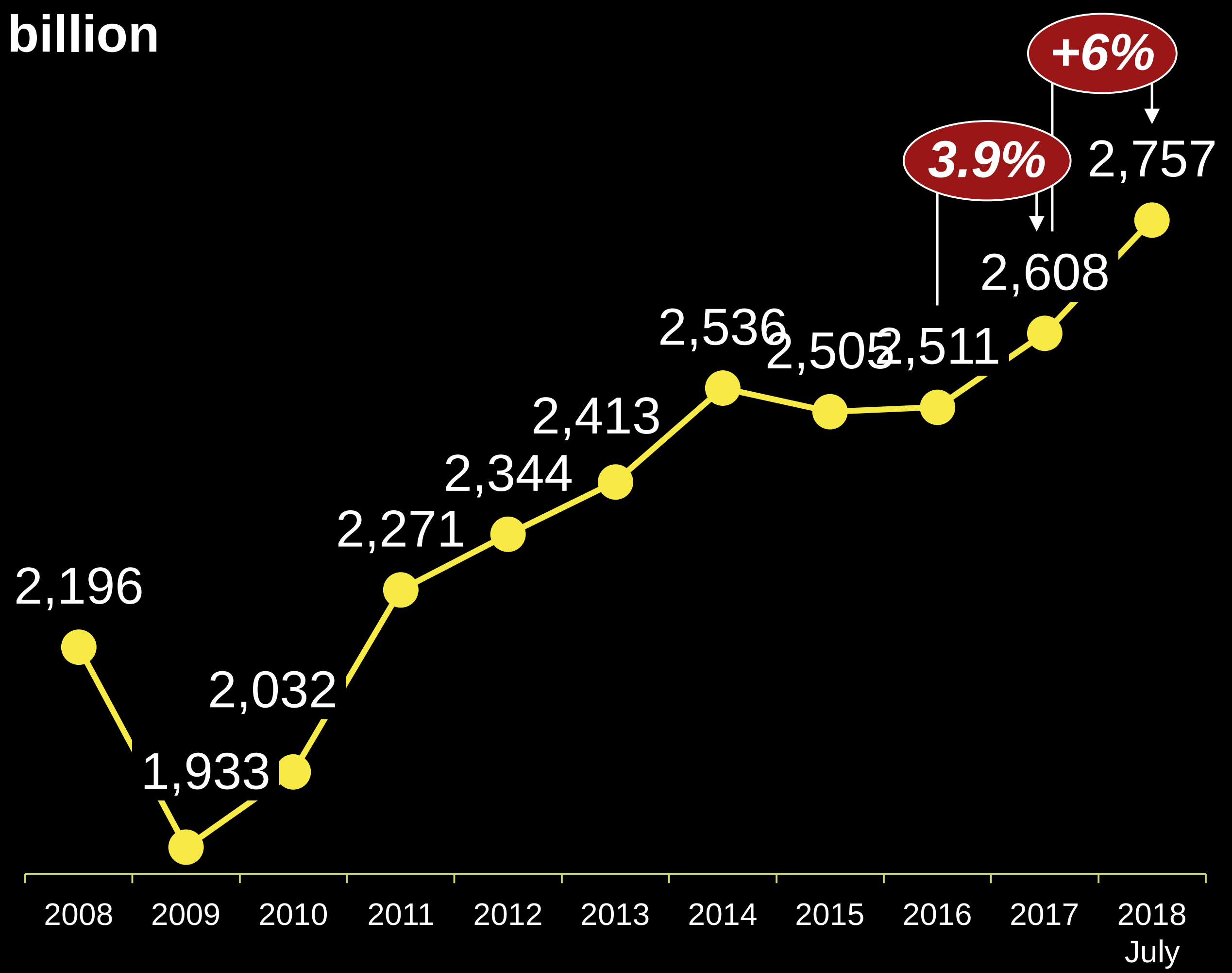


Source: St. Louis Fed

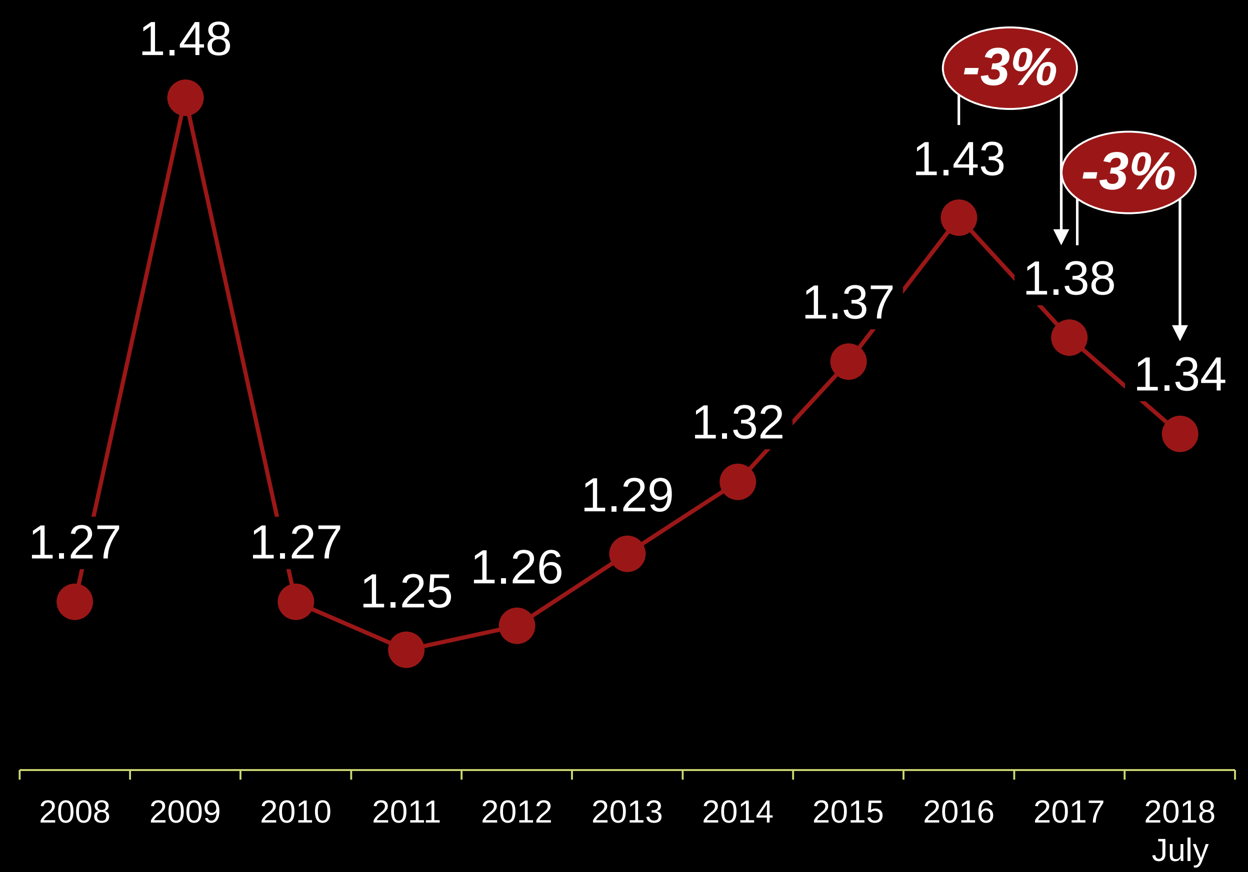
Inventory levels and productivity continue to improve at the same time

Total US private inventories

$ billion



Inventory to Sales Ratio

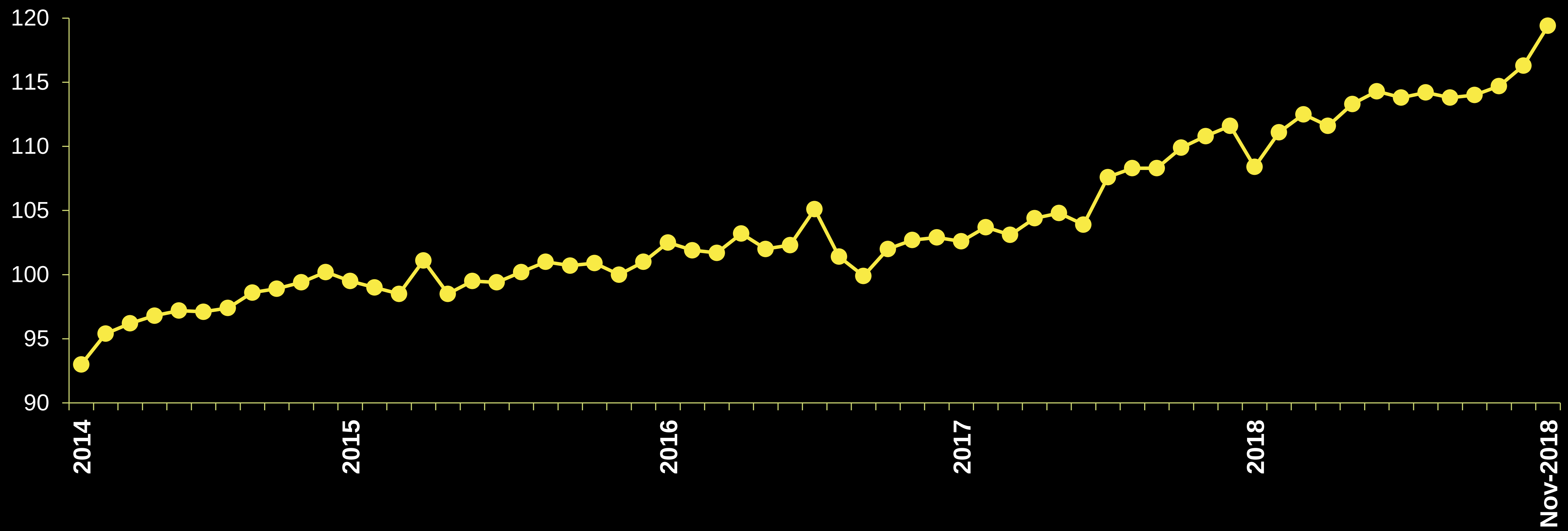


Note: Total US private inventories includes manufacturing, retail, and wholesale and represents stock or goods available for sale . Annual numbers are the yearly average.
Source: Bureau of Economic Analysis

Motor carriers: Truck tonnage continues 2018 in uptrend

Truck Tonnage Index

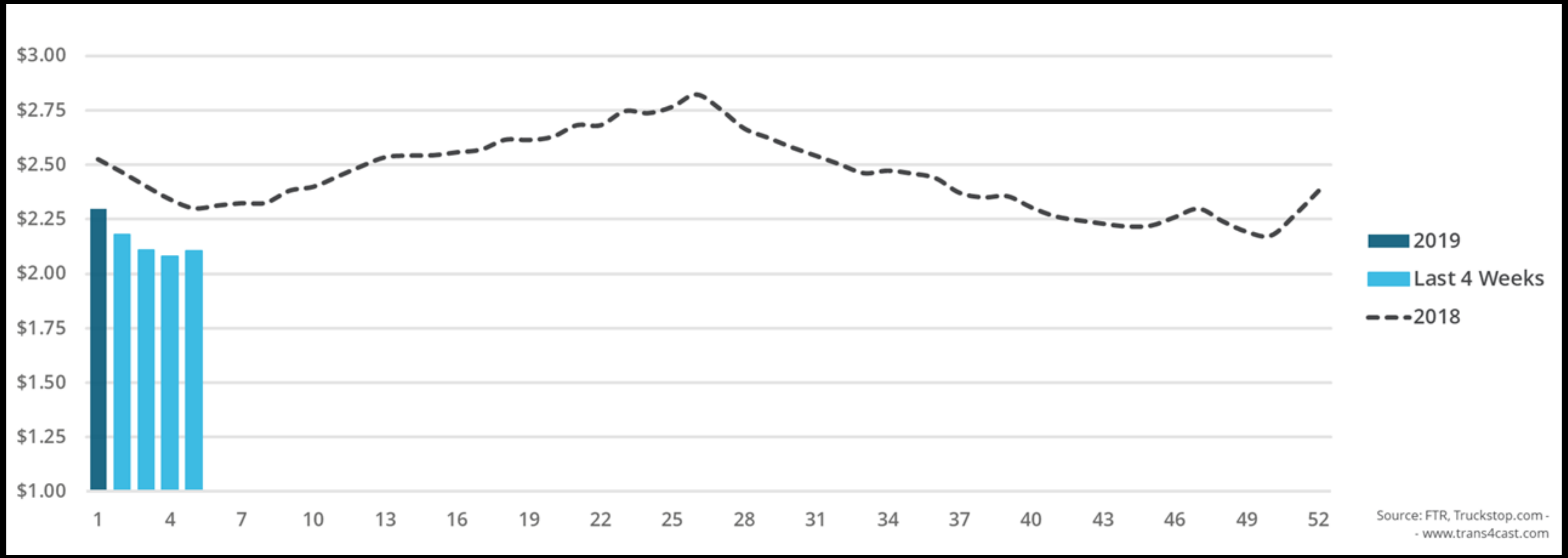
Seasonally adjusted monthly values (2015 [index year]= 100)



Source: Bureau of Transportation Statistics

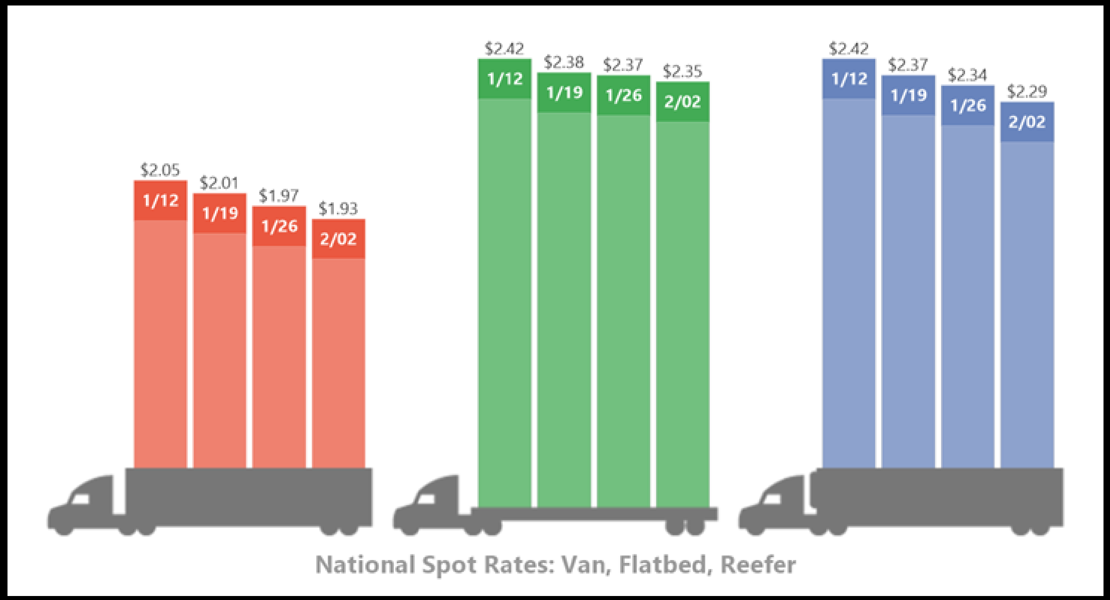
After a 30% increase in 2017 spot market started to ease mid 2018

Dry van spot market rates by week



Source: Truckstop.com

Van, Flatbed, Reefer (last 4 weeks)

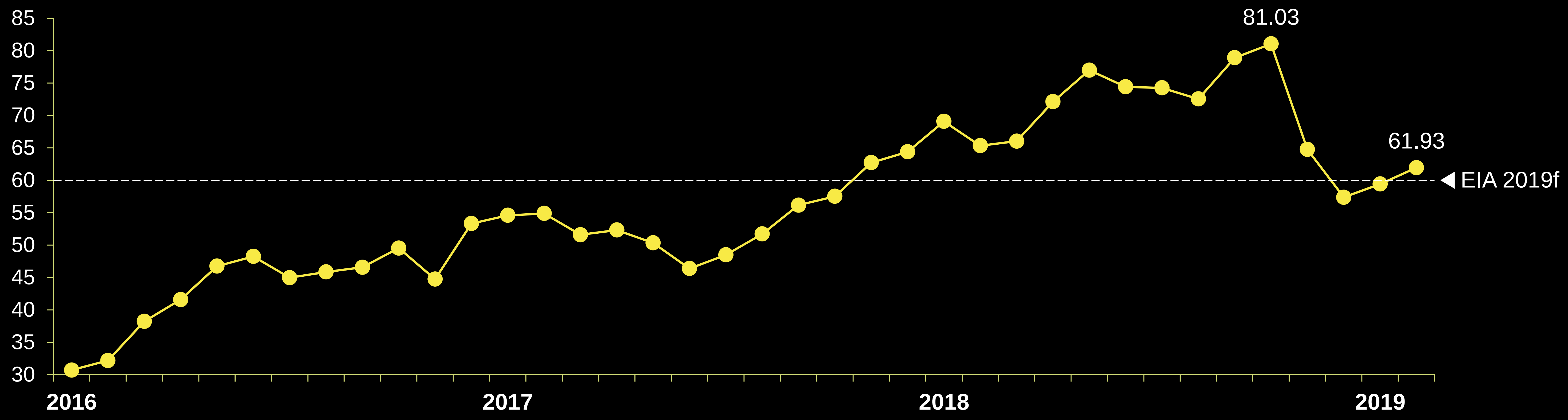


Source: DAT.com

- Prices started 2019 ~9% below 2018
- After 2018 August prices started to come down 2x steeper than expected
- In 2017 prices climbed and carriers largely responded by purging their least profitable customers and ordering record numbers of new assets
- Variety of tactics deployed to soften the blow: researching dedicated models, operational improvements and freight efficiency initiatives
- CASS and Morgan Stanley Indexes tell similar stories of softening

Oil Continued 2018 in uptrend then fell from a peak of $81

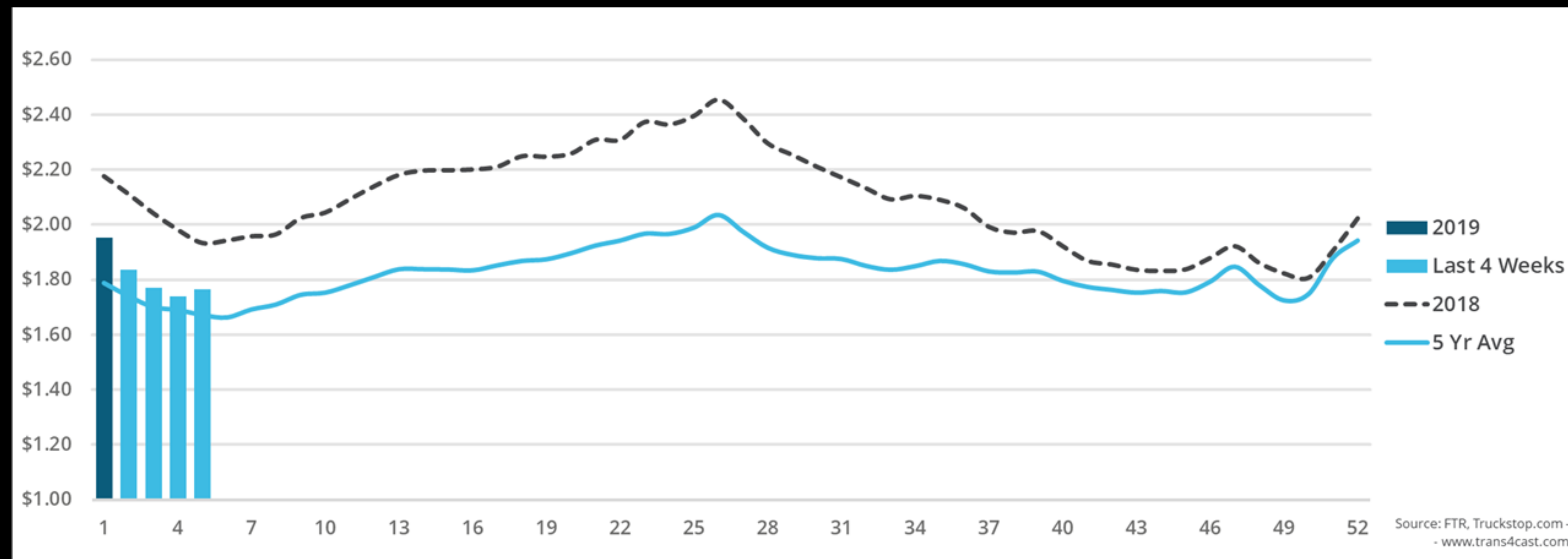
Brent Oil ($/barrel)



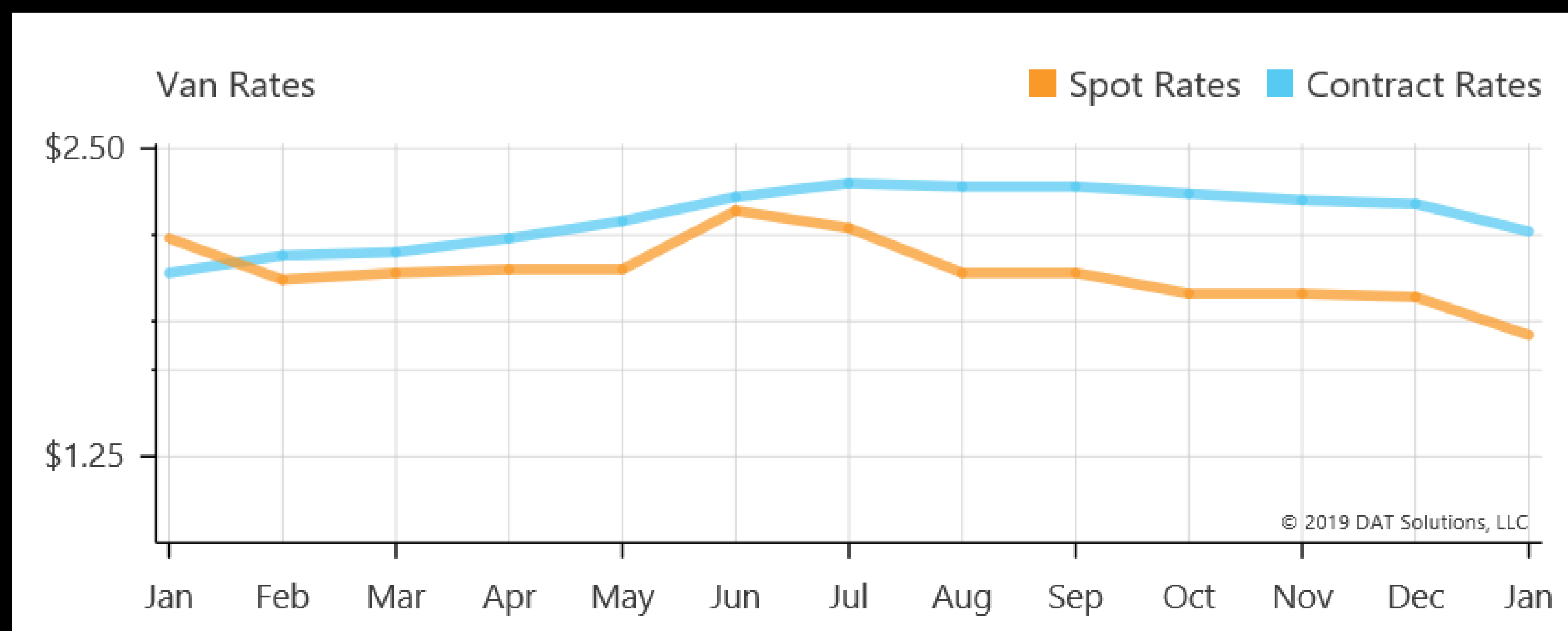
Source: Bureau of Transportation Statistics, EIA Energy Information Administration

Contract rates caught up with trend in Q4

Spot rates excluding fuel down 23% in Q3 (truckstop.com)



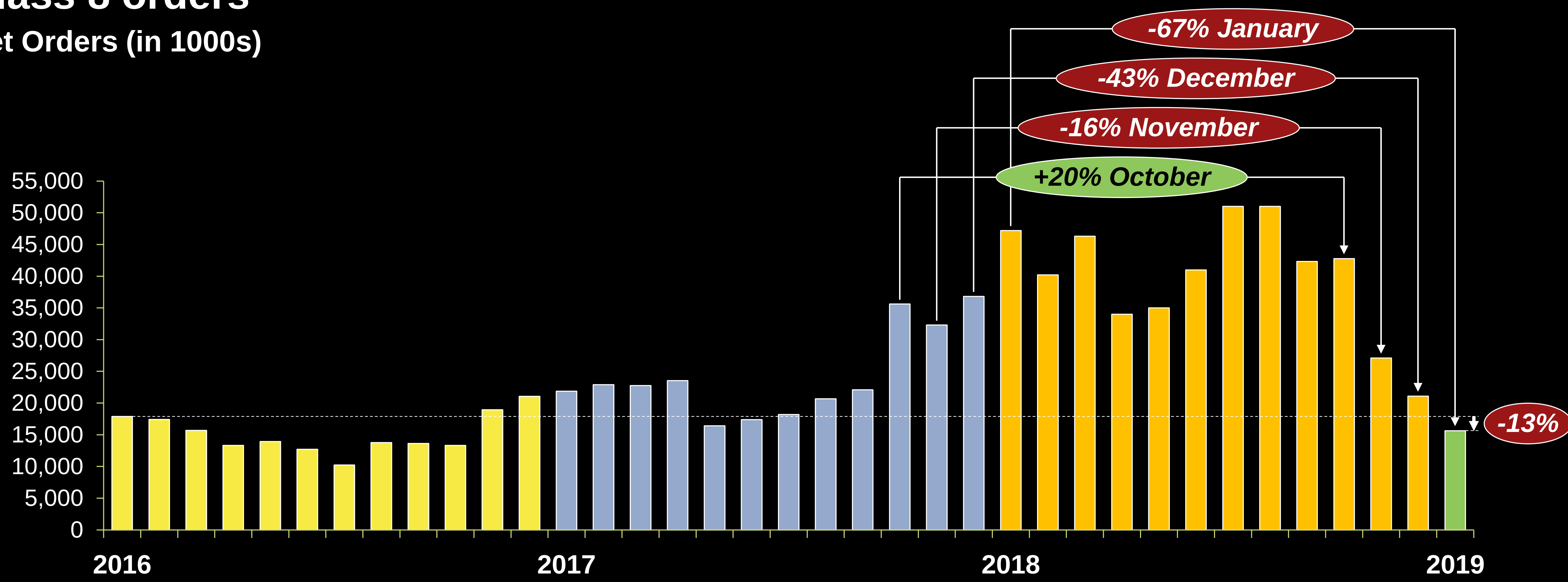
Contract rates started to decline in Q4 (dat.com)



Class 8 orders hit record highs in 2018 and dropped to 2016 levels in 2019

Class 8 orders

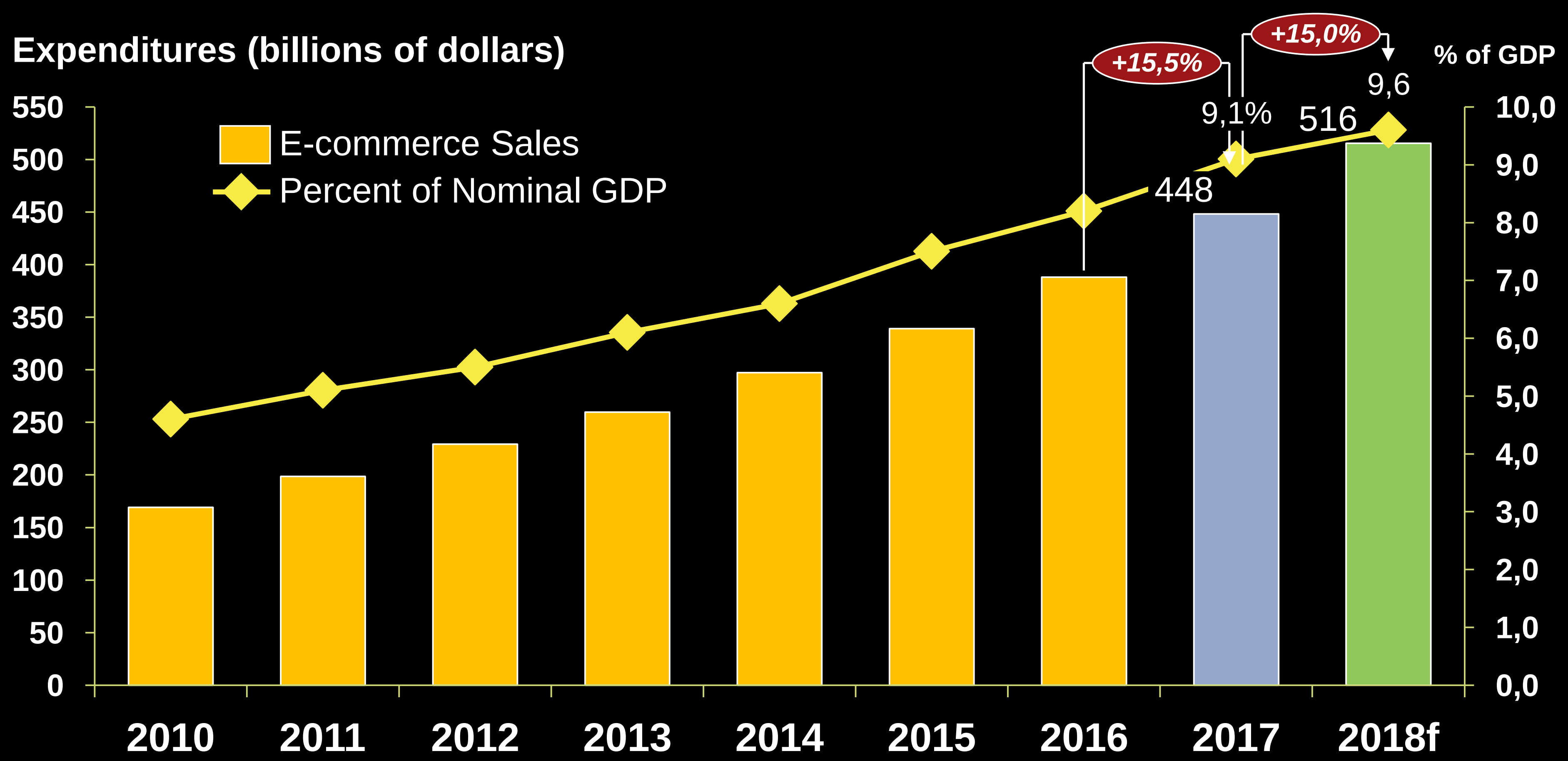
Net Orders (in 1000s)



Source: FTR Associates via Bloomberg, North America Monthly Class 8 NET Orders

Parcel: e-commerce growth drives growth

E-commerce grew ~15% to reach ~$516 billion in 2018, 9.6% of Total Retail



- Parcel expenditures rose 7% to almost $100 billion in 2017
- Rising volumes and customer expectations force a capital-intensive “re-think” of last mile supply chain
- Carriers have room to raise prices while markets are figuring out who will bear investment burdens
- Same day/shorter expectation will continue to grow, increasing inventories
- Parcel cost headwinds may impede e-commerce strategies, particularly in cost-sensitive segments

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Consumer trends and evolving needs require new logistics' capabilities

Consumer Direct
- Shippers developing B2C capabilities
- Partnerships with Parcel Carriers

Assortment Explosion
- Fragmented Flows (Online only vs. in-store SKUs)
- Creative inventory deployment strategies

Fast and Free Delivery
- Emergence of crowdsourced and local asset based delivery
- Real time tracking and dynamic routing

Personalization and Local
- Shorter supply chains
- Retailers exploring dedicated or private final mile fleets

Expanded Role of Stores
- Sharing of assets between B2B, e-commerce, stores
- Pressure on DSD model

Long-haul and Dedicated fleet
- Expedited deliveries to retailers (stock-outs)
- Real time tracking and dynamic routing of in transit shipments
- Point of sale visibility to inventory to aid just in time replenishment
- Reverse logistics services
- Routing and asset optimization for dedicated fleet
- Value added services such a scheduling, sourcing and payments processing
- Direct store delivery execution

International
- International point-to-point service and visibility
- Customs clearance special operations

Last Mile
- Home delivery (cost, reach, service)
- Service to remote areas
- Real time tracking
- Routing and asset optimization

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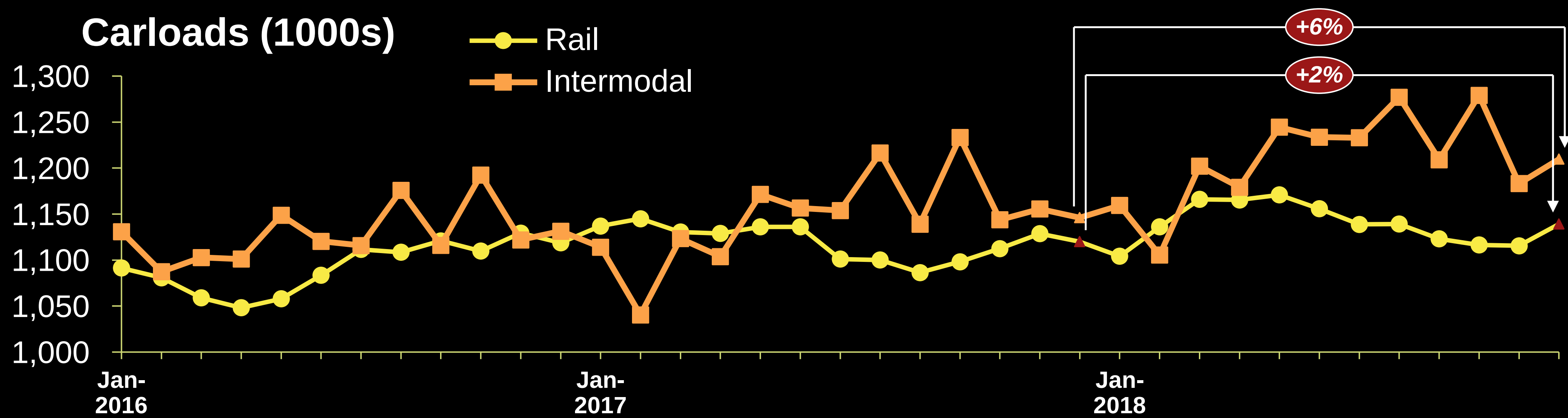
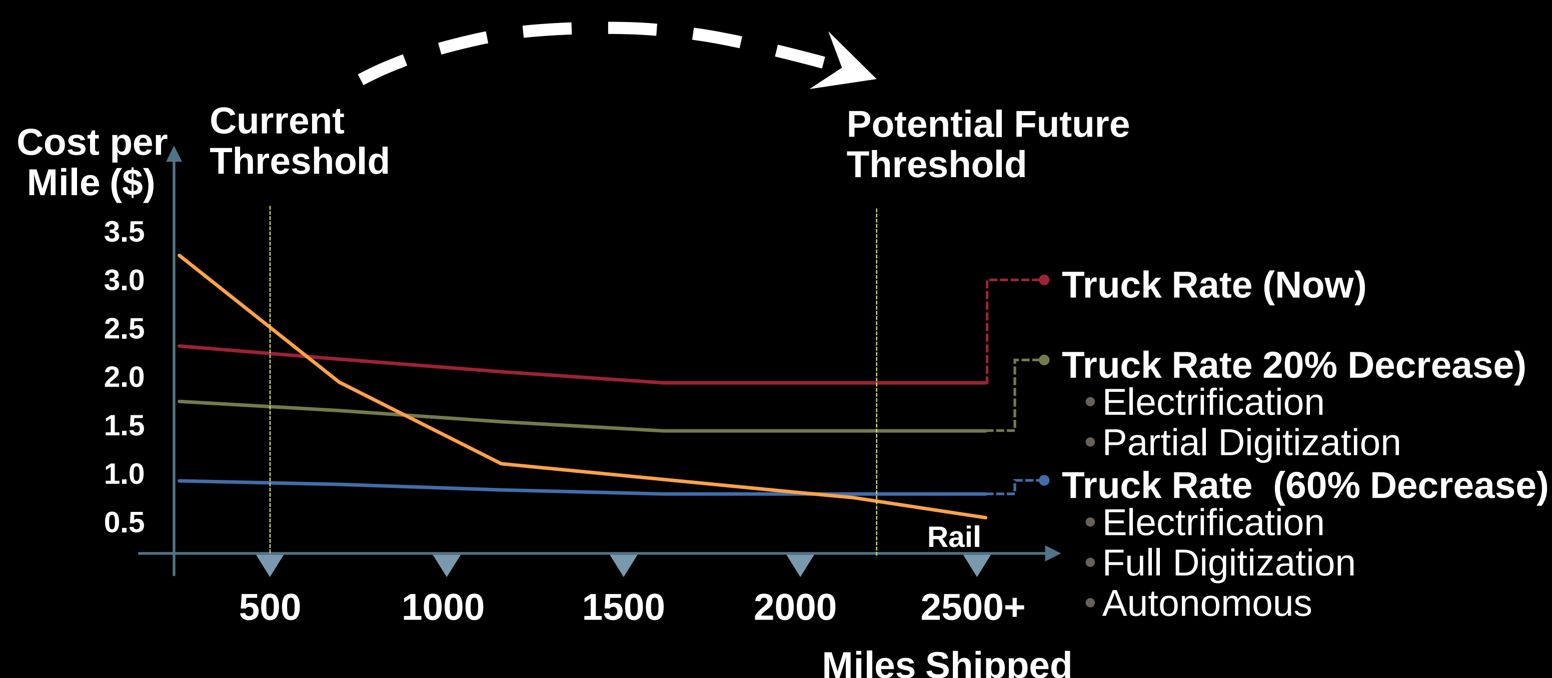
Rail: 2% YoY
Intermodal: 6% YoY



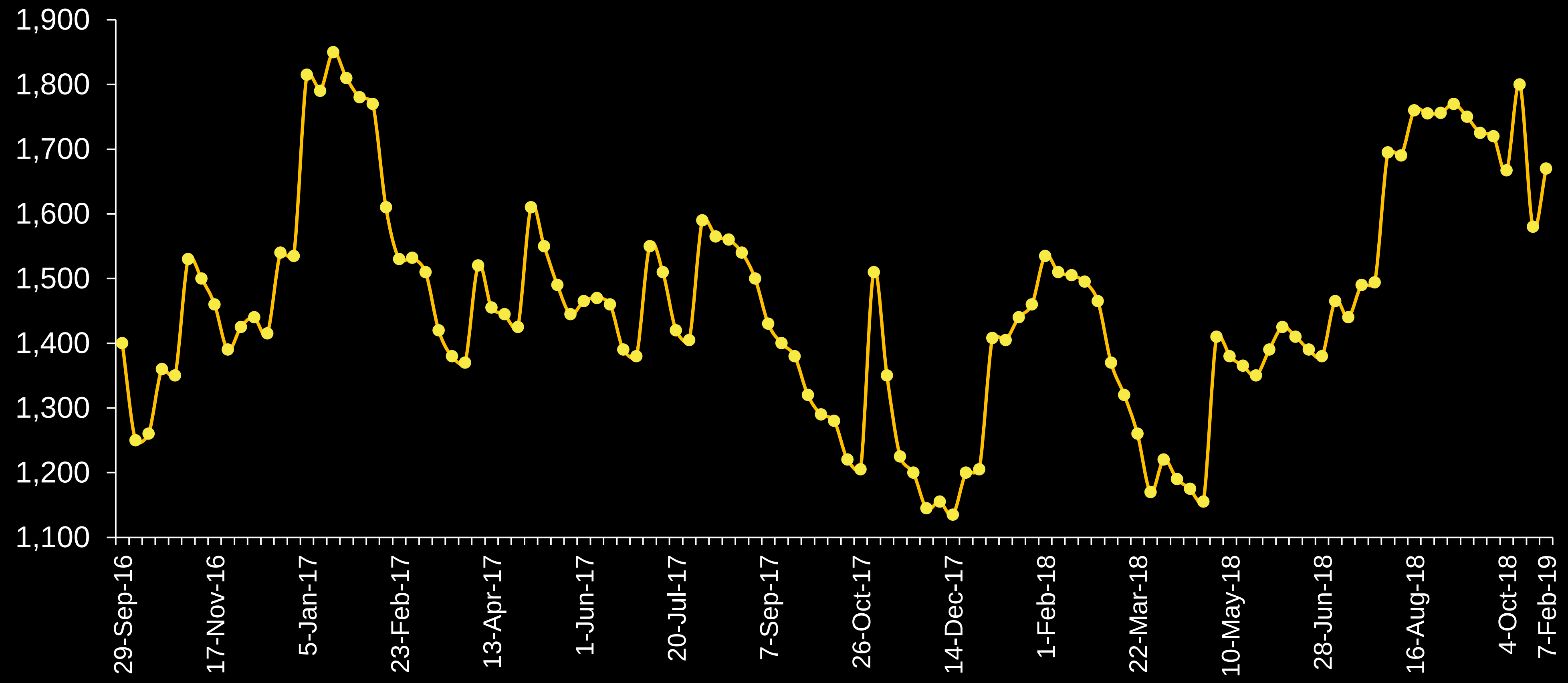


- Cost to the rail operators increased 1-2% in 2018
- Significant uptick seen in rail volume primarily driven by intermodal
- Operating ratios continued to decline as railroads cut headcount, optimized asset utilization and rolling stock inventory, and increased train speeds and lengths
- Increased demand and precision railroading triggered a rise in complaints in 2017
- Rail and intermodal will continue to grow in the short-medium term due to industrial and agricultural output, but long-term concerns exist given the decline in coal production
- Major shifts in coal volume unlikely in the short term, unless energy generation policy changes
- In the short term we expect an estimated 4 - 6% increase in the rates over Jan 2018
- In the long term, we expect rail/intermodal challenged by OTR innovation making trucking more competitive

Sources: Bureau of Transportation Statistics; A.T. Kearney analysis

Water and ports: a stormy year

Drewry World Container Index ($/40ft)



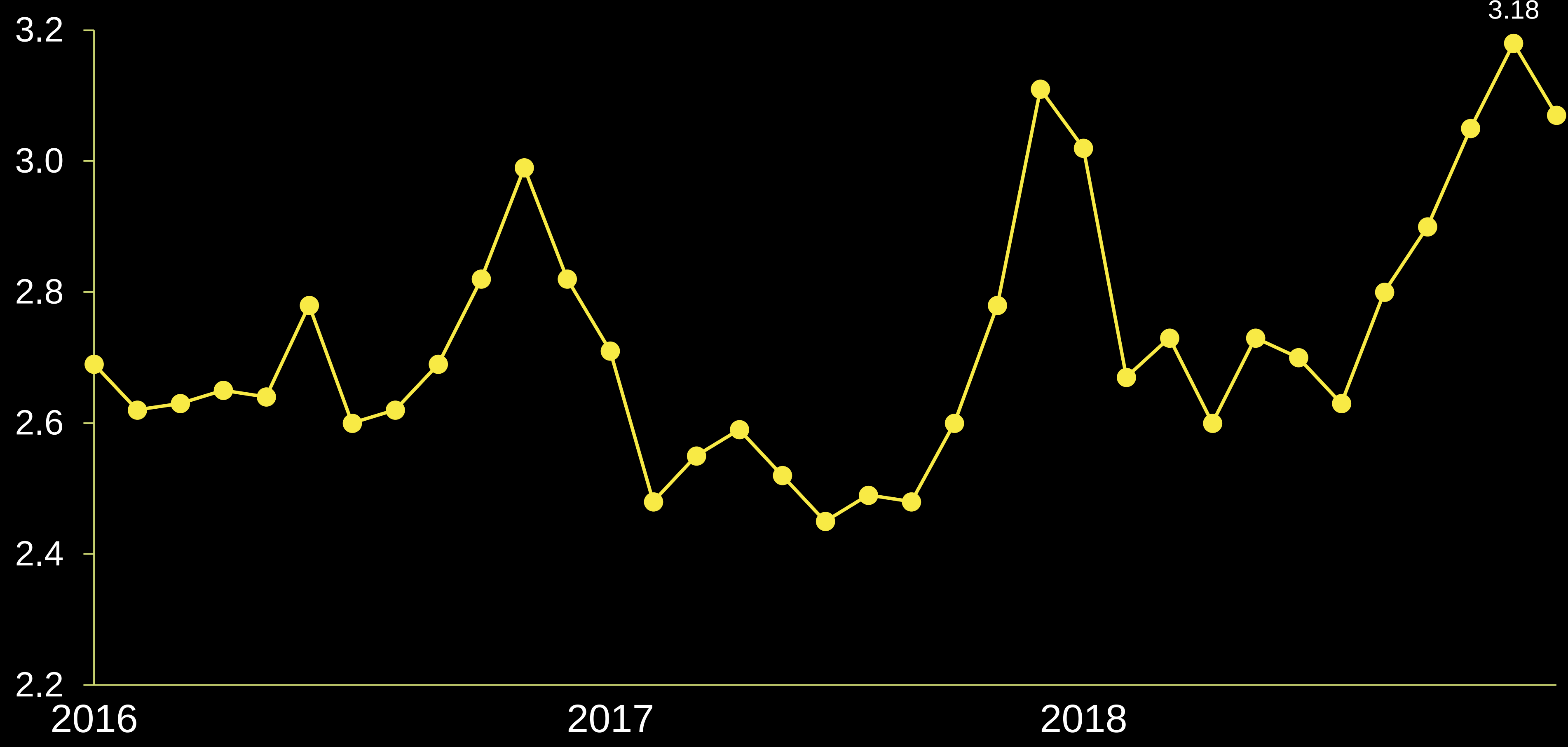
- Robust global economy will continue to create demand for Ocean
- Low Sulfur IMO 2020 regulations will start impacting prices early 2019, impacts estimated ~30% on BAF and 8-10% on net rates
- Long delays as imports hit US ports to avoid tariffs for Jan 2019. The demand could be soft early 2019 as most of the cargo was front-loaded due to trade wars

Note: TEU is twenty-foot equivalent unit.
Sources: port statistics; A.T. Kearney analysis

Airfreight: Need for speed drove volumes and prices up in 2017

Drewry East-West Average rate

$ per kilo



- Air freight volumes rose 9% in 2017 due to surging demand for ultra-fast shipments while the prices rose 4%
- 3.5% drop on December 2018
- Rates are expected to continue to decrease in January 2019

Note: Index shows average of all-in airfreight buy rates paid by forwarders to airlines for standard deferred airport-to-airport airfreight services.
Source: Drewry's Sea & Air Shipper Insight

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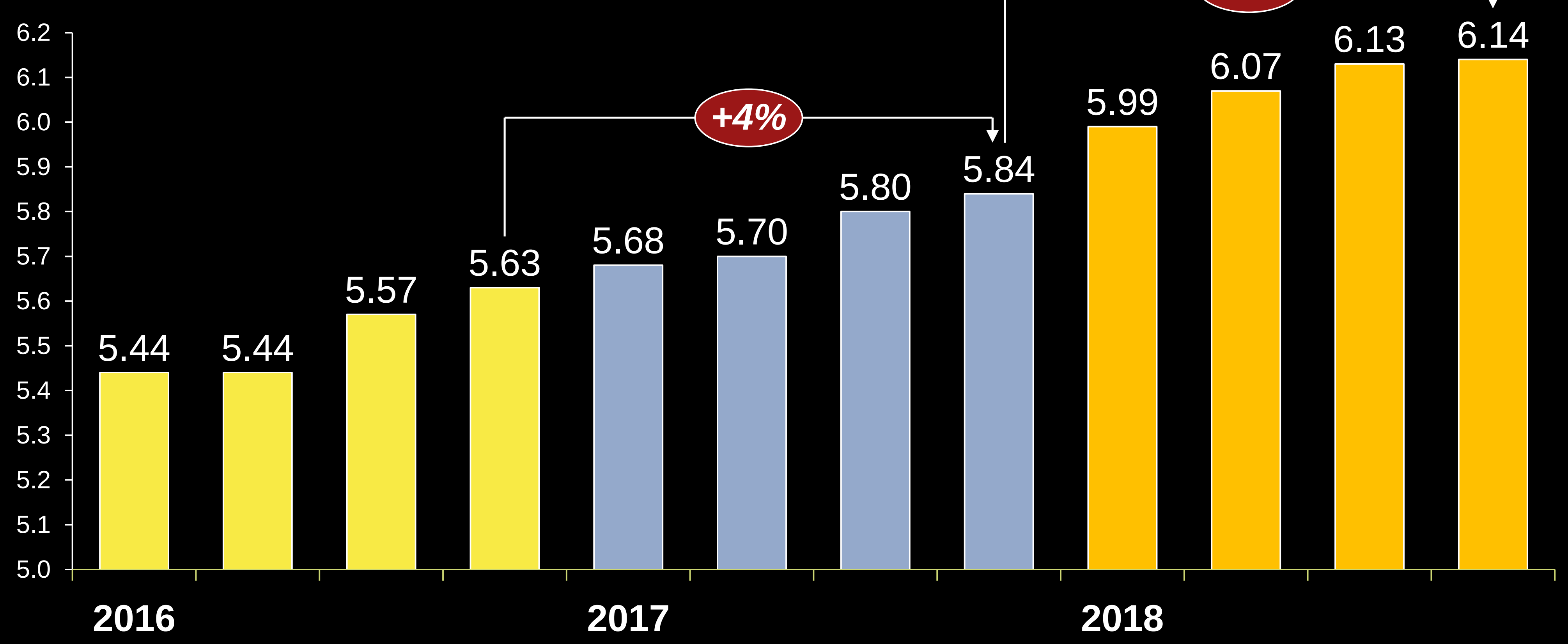
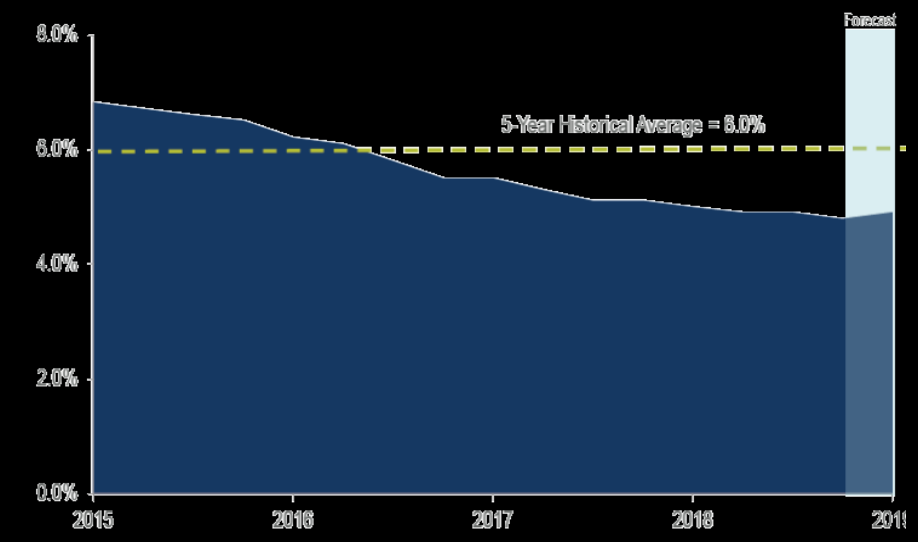
Warehousing: innovate or die

Rental rates rose 4% nationally in 2017 and 5% in 2018

Weighted Average Asking Rent $ PSF



Overall Vacancy



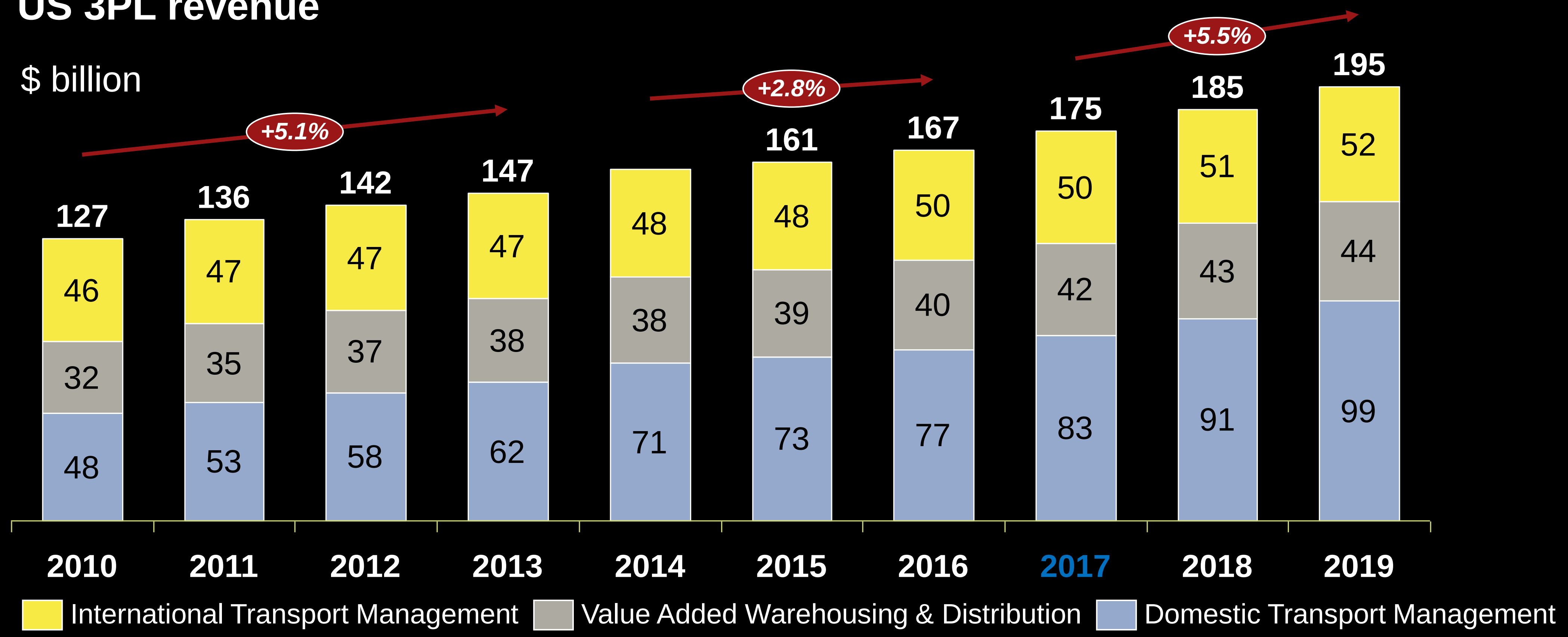
- Pop-up warehouses are back by popular demand
- Warehouse efficiency becomes paramount for companies striving to meet ever-shrinking e-commerce delivery lead times
- Autonomous mobile robots (AMRs) are popular again, to address rising pressure to improve worker productivity
- Robotic-centric solutions are easier to set up and use; and are faster, smarter, cheaper
- Overall vacancy dropped to 4.8%, well below 5 yr avg. of 6%

Source: Cushman and Wakefield; MARKETBEAT U.S. Industrial Q1 2017 - US_Industrial_MarketBeatSnapshot_Q117.pdf; MARKETBEAT U.S. Industrial Q1 2018 - US_Industrial_MarketBeatSnapshot_Q118.pdf

Third-party (3PL) Logistics: Efficiency pressures intensify

The US 3PL is poised for 5.5% growth after 2016 acquisitions

US 3PL revenue



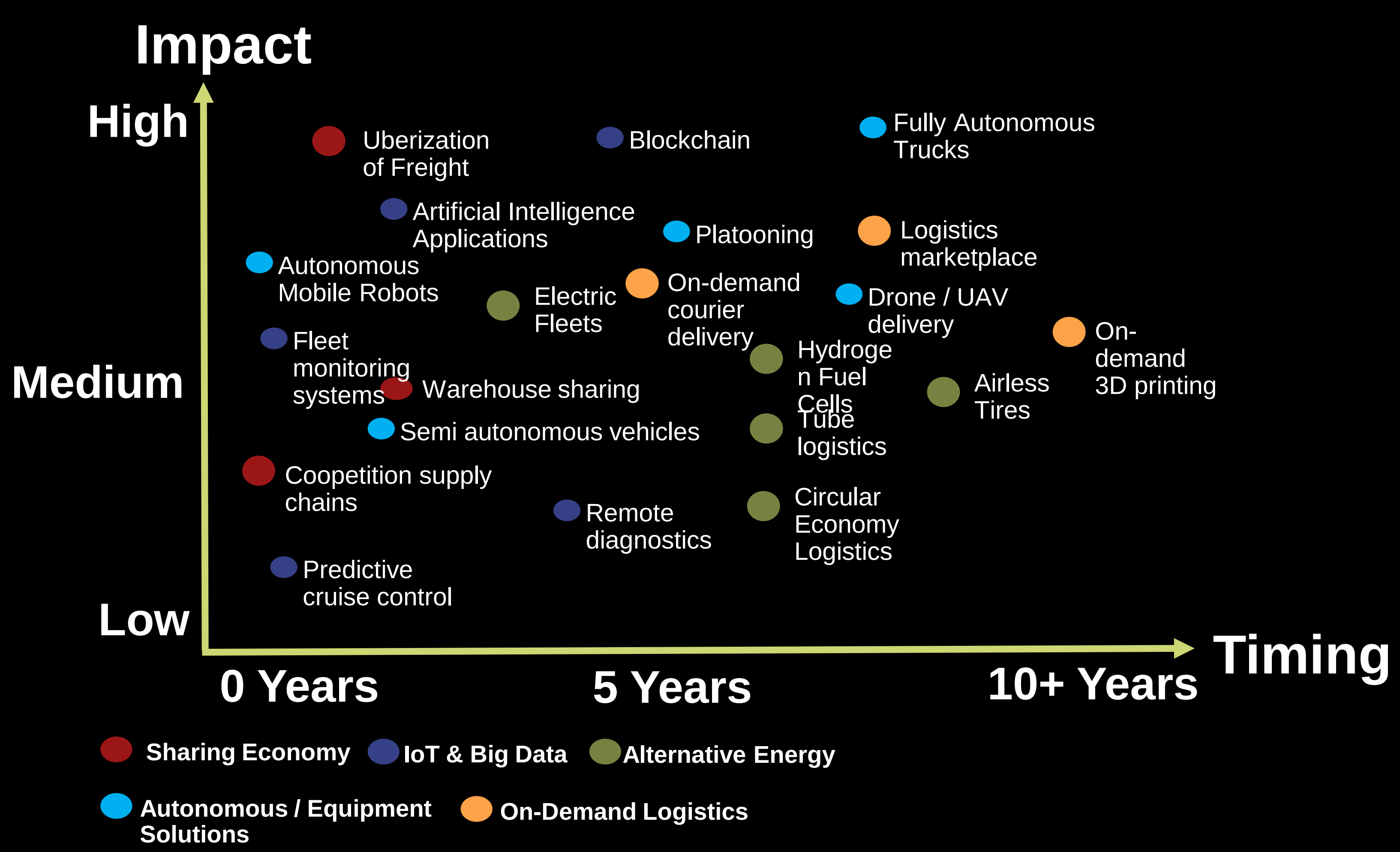
- Market is expected to grow 5.5% between 2017-19
- Shipper-3PL interactions continue to focus on short term cost-cutting, while mutual mistrust prevents them from forging long-term strategic partnerships
- Technologies underpinning the Fourth Industrial Revolution hold the key to enable such partnerships
- As shippers trying to get more efficient, they are intensifying pressure on 3PLs

Source: Armstrong & Associates

Trends: Technology is promising yet it will be a long term solution

Technology offerings to battle capacity issues and rising costs

Innovation Grid: a Ten-Year Outlook



Near – Mid Term Technology Solutions

- Artificial Intelligence
- Autonomous Mobile Robots
- Autonomous Vehicles
- Blockchain
- “Uberization” of Freight

Near Term Factors

- Investments in crumbling infrastructure
- Global trade wars
- Regulations
- Driver supply

Note: IoT is Internet of Things. UAV is Unmanned Aerial Vehicle. OTA is Over-The-Air.
Source: A.T. Kearney Analysis

Supply chains must sense and pivot

Eliminate Waste

Improve communication between Shipper, Carrier and Customer (Integrated Planning)

Reinvent or Die

Sensing: Ability to anticipate with better accuracy, broader field of vision and longer lead time

Pivoting: The ability to make decisions, rewire processes and assets to respond to unanticipated events

For any questions please reach out:

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Europe	Amsterdam Berlin Brussels Bucharest	Copenhagen Düsseldorf Lisbon Ljubljana	London Madrid Milan Moscow	Munich Oslo Paris Prague	Rome Stockholm Vienna Warsaw	Zurich	
Middle East and Africa	Abu Dhabi Doha	Dubai Istanbul	Johannesburg Riyadh				

Appendix:

Technology Impact

Shipper, LSP and Customer Collaboration

Trends Impacting Short and Long Term

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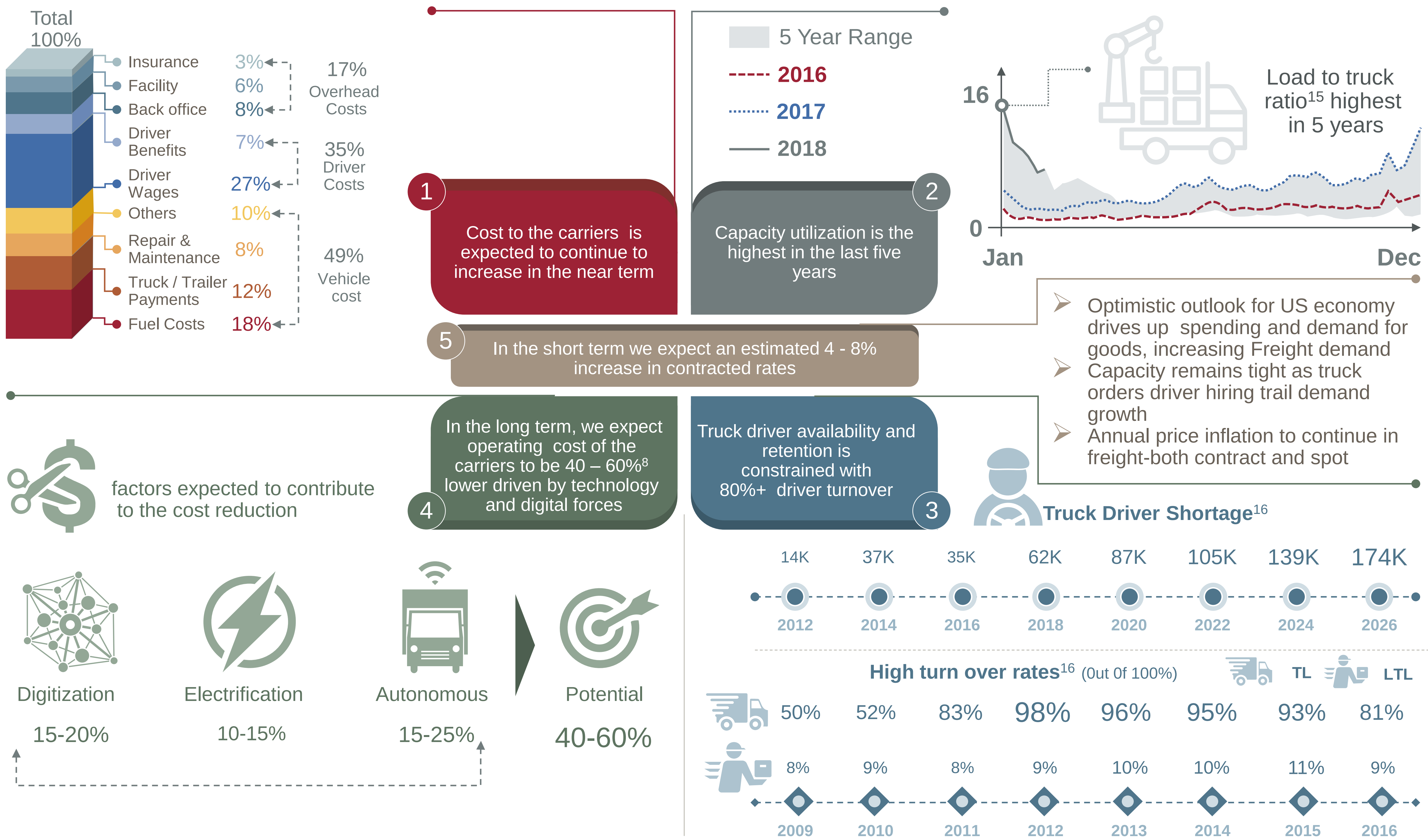
Technology impacts the OTR cost structure by increasing near term rate while making long term dependent on shippers participation



Source: A.T. Kearney

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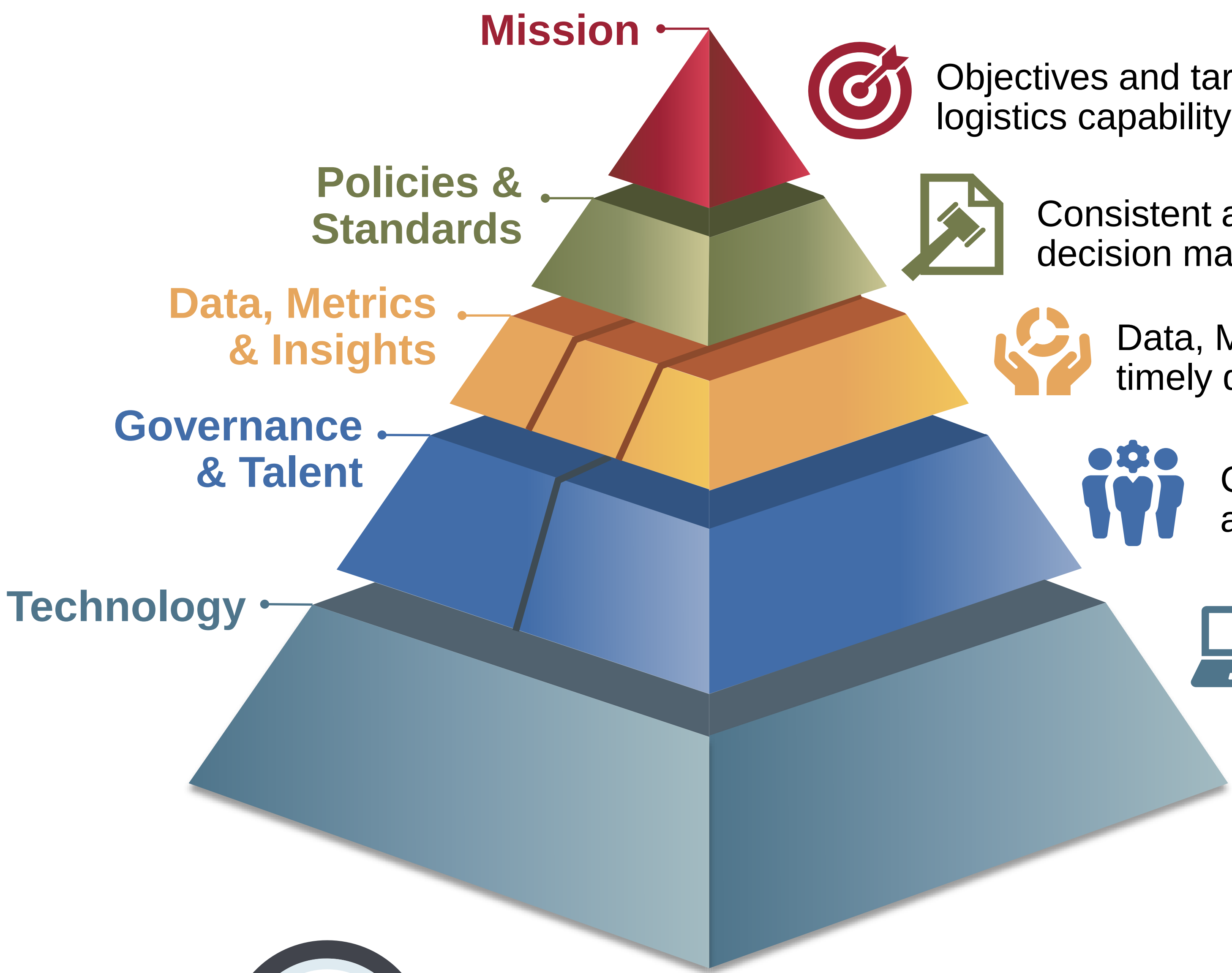
A short term call to action would be to examine logistic capability for opportunities internally, with LSPs and customers



Objectives and targeted value of the logistics capability

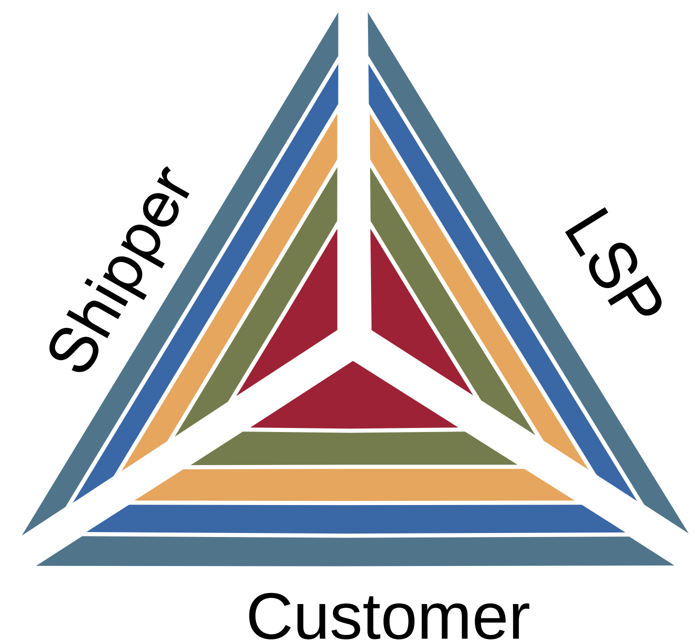
Consistent and integrated processes to enable better decision making and streamlined operations

Data, Metrics and Insights that matter to operate and make timely decisions supported by scenario analysis

Clear decision rights, incentive structures and analytical talent to enable decision making

Enabling the defined analytics and processes with scalable and impactful technologies

Top down view of the three faces of the Pyramid



Source: A.T. Kearney

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A short term call to action would be to consider relevant levers and their application to mitigate the transportation headwinds

Carrier Management Strategy
Rigorous management of cost-to-serve through segmentation of lanes and carriers and mode allocation based on objectives
Core carrier program, Lane volatility, Mode Allocation, Broker strategy, Captive Fleet

Operating Model
Evaluation of logistics functions that should remain internal and those better served by external specialists
Functional Outsourcing

Joint Logistics Planning
Collaboration on short term replenishment and inventory planning
CPFR, Order to Delivery lead times, VMI

Collaborative Optimization
Advanced analytics applied to sourcing allocation design, awarding business to the best partner based on needs of lane/org
Strategic Sourcing, Collaborative Network Design

Performance Management
Evaluation of internal and external partner performance and communication of actionable feedback
Metrics that Matter

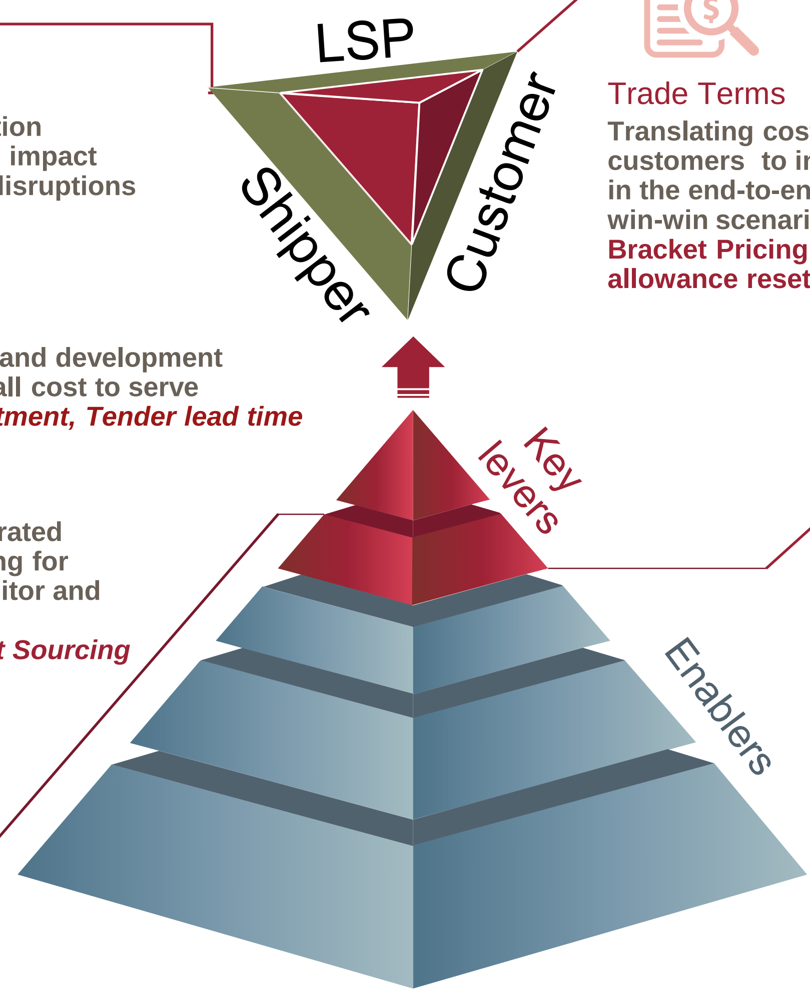
Route to Market
Overall design of how to and from where to deliver to customers
DSD, eCommerce, Distributor model

Integrated Business Planning
Effective cross-functional teaming to execute strategy, translate forward looking transportation requirements into insights about cost, service impact and capacity needs and minimize impacts of disruptions on an end-to-end basis
Scenario Analysis, Trade Offs

Shipper of Choice
Intensive focus on drivers of cost for carriers and development of process and policy updates to reduce overall cost to serve
Load/Unload time, Payment terms, Driver treatment, Tender lead time

End-to-End Supply Chain Optimization
Advanced analytics applied to design of integrated production and distribution network accounting for operational and financial constraints and monitor and measure compliance to plan
Regional Production and Distribution, Product Sourcing Matrix Design, Lane compliance

Captive Fleet Modeling
Advanced analytics applied to sizing and scoping of captive fleet networks – needed to truly maximize benefits
Fleet sizing, lane allocation, Backhaul programs, Routing strategy



Trade Terms
Translating cost-to-serve for specific customers to incentivize efficient behaviors in the end-to-end supply chain to create win-win scenarios
Bracket Pricing program, CPU allowance reset, Efficiency bonuses

Analytics skillset
Next gen talent proficient with advanced analytical tools and data driven decision making

Metrics that Matter
Framework to identify needed metrics translated into actionable insights trough integration of internal and external data

Digital tools and technology
AI, ML and IoT applications that enable end to end supply chain visibility and decision making

Shared cross functional Incentives
Alignment of incentives is critical (and frequently overlooked) to efficient end-to-end execution across functions and organizations

Integrated external and internal data
Digitization and democratization of data is a foundation for the analytics driving decisions and actions in supply chain

Source: A.T. Kearney

ATKearney

Rapid and accelerated technology innovation can transform logistics' assets and cost structure (1/2)

The Sharing Economy

What?

Shared logistics platforms can significantly reduce systemwide unused capacity

How?

- Mindset shift from single ownership to shared and multi-ownership models
- Automatic Freight Matching and Digital Freight Boards
- Variable use models / Truck-as- a Service
- Asset and Network Sharing
- Driver Relay Models

Benefits

To shippers

- Hassle free tenders
- Larger base at hand
- Real-time updates
- Price transparency

To carriers

- Seamless billing
- Fewer deadheads
- Better utilization
- Instant payments

Estimated empty mileage in OTR network **30% to 40%**

IoT and Big Data

What?

Digitization and Telematics can reduce the total cost of ownership of a truck by 10-20% through efficiency improvements

How?

Developing IoT, ML, AI Use Cases

OTR17

- Remote M&R diagnostics
- Behavior monitoring
- Compliance systems
- Platooning
- Usage based insurance
- Predictive cruise control
- Brake usage monitoring

Rail

- Digital terminal network management
- Predictive maintenance
- Dynamic locomotive power mgmt.
- Visualization based monitoring
- Self-Diagnosing assets
- Collaborative interchange management

Significant startup and venture capital interest in this space

Alternative Energy

What?

Electric drive train technology can reduce trucking costs by 10-15%

How?

- Comparably lower fuel prices reduces incentives in the short run, but energy dependence, environment concerns and regional regulations are pushing R&D focus

CNG Engines

Hybrid Engines

Electric Drive Trains

Hydrogen Fuel Cell Trucks

Benefits

- Reduced dependence on fossil fuels
- Reduced maintenance
- Night time driving in sound and emission sensitive urban areas

Challenges

- Vast recharging infrastructure is required
- Steep investment; reaching scale essential for economics to work

Adoption and Applications

Light/ medium duty trucks are better positioned to adopt this technology than long haul heavy duty trucks given the challenges

Source: A.T. Kearney

ATKearney

Rapid and accelerated technology innovation can transform logistics' assets and cost structure (2/2)

Autonomous Driving

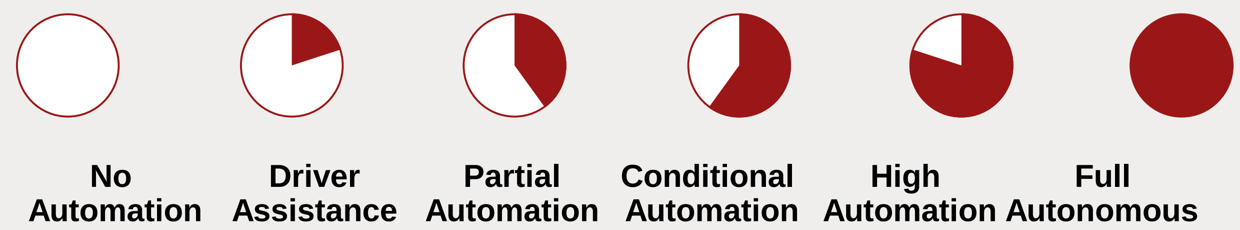
What?

Potential to address substantial portion of labor costs which range from 10-50% of freight costs in OTR and Rail

How?

Autonomous Trucking

Today → Long term



Driverless Locomotive in Development

Autonomous trains under human supervision already in operation on a route operated by an Australia based mining company[18]

Blockchain and Physical Internet

What?

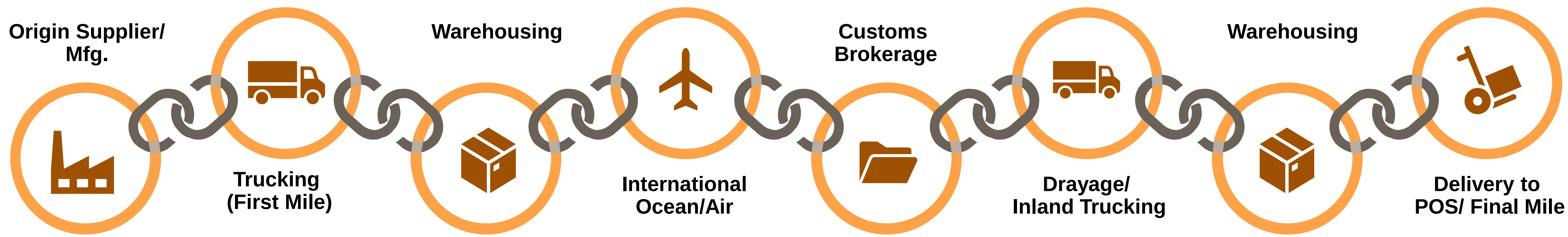
Blockchain may give rise to new level of collaborative supply chains with seamless sharing of information

How?

Underlying Technology
- Standardized data elements
- Traceable log of all transactions
- Secure foundation in cryptography

Developing Sample Use Cases
- International/ cross border transactions
- Real-time information and product tracking
- Payments and invoice processing

Challenges
- Regulatory framework across international jurisdictions
- Cyber security, fraud and enforcement concerns
- Impetus for large logistics players to be first movers



Source: A.T. Kearney