



**Surface Transportation Board**  
Washington, D.C. 20423-0001

**Minutes of the National Grain Car Council Meeting**

Thursday, September 12, 2019  
The Chase Park Plaza – Royal Sonesta St. Louis  
212 North Kingshighway Boulevard  
St. Louis, Missouri 63108

**Attendance**

Attendance sheets are appended to these minutes.

Approved substitutes for the meeting:

Amy Homan	Iowa Northern Railway Company
Ashley King	Norfolk Southern
Jim Skeens	Norfolk Southern
Chad Hartwig	The Greenbrier Companies
Jim Sobie	TrinityRail

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**AGENDA**

- 1:00 pm
- 1) Welcome, call to order, and introductions
    - Chair Sharon Clark
    - Safety Briefing – Vice Chair Doug Story
    - Scott Mills – TEGMA
    - Introductions
      - Mike Small – Approved substitutes
      - Members – Self introductions
  - 2) Adoption of 2018 Minutes – Sharon Clark
  - 3) Dynamic Changes in Rail Shipping Mechanisms for Grain, Competition
    - Dr. William Wilson – North Dakota State University
  - 4) Agricultural Transportation Open Data Visualization Project
    - Bruce Blanton, Jesse Gastelle – Agricultural Marketing Service,  
U.S. Department of Agriculture
  - 5) Private Grain Car Issues
    - Darrell Wallace, Executive Director, North America Freight Car Association
- 3:00-3:15 pm
- Break
- 6) Nominations from the floor for NGCC officers
  - 7) Shipper Panel Moderator: Bruce Sutherland, MAC
    - US domestic market supply & demand dynamics
      - Chris Egland, Bunge
    - U.S. Western Outlook
      - Brad Hildebrand, Cargill
    - U.S. Eastern Outlook

Ross Trentadue, Zen-Noh Grain

6) Railroad Reports – Moderator: Doug Story, Watco  
Class I reports  
Class II/III reports

7) Rail Equipment Overview, Rob Zmudka, GATX

8) Closing Remarks  
- Chairman Ann Begeman  
- NGCC Co-Chair Patrick Fuchs  
- Commissioner Martin Oberman

5:00 pm 9) Adjourn – Sharon Clark and Doug Story

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### **Welcome, Call to Order, and Introductions**

Sharon Clark called the meeting to order and welcomed members to the meeting, and Doug Story gave the safety briefing. Mike Small introduced the approved substitutes, followed by members introducing themselves.

### **Adoption of 2018 Minutes**

The 2018 minutes were adopted.

### **Dynamic Changes in Rail Shipping Mechanisms for Grain**

Dr. William Wilson – North Dakota State University

Dr. Wilson discussed the primary and secondary rail car markets. There are several methods to allocate rail cars: random; contract; historical; first order, first served; auction. Allocation by auction is more efficient. Other countries have incentives allocated ex-post. The industry is helped by price transparency.

Between the primary and secondary markets, the secondary market—one shipper to another—is more expensive and volatile.

Velocity is one of the most important factors. Recently, it has been less volatile.

Dr. Wilson did a 2011 study looking at origin basis values and what impacts them; subsequent studies have been done. Found that similar years behave similarly.

Dr. Wilson reviewed several studies. One found that changes in shipping costs have a positive effect on destination basis and a negative effect on origin basis. Another found that the #1 factor in export basis was the basis in Brazil, with the PNW basis more affected than the gulf basis. There was no down-season pattern—Gulf & PNW are not correlated on a seasonal basis.

Regarding 2019 developments, Brazil was increasing capacity, but had long wait times for elevators. Countries other than US do not generally have excess capacity. Between 2016 and 2019, there has been a radical change with virtually no exports out of the PNW now. China has been hugely significant. Brazil's basis has increased from 50-60 cents, and the basis in North Dakota fell due to trade tensions. The PNW spot basis (bid) is now at a record low. The radical changes in flows and uncertainty have been forestalling investments, but there has been growth in logistics spending elsewhere: shuttles in Ukraine; dredging in Argentina; Panama Canal expansion.

Transferability is valuable to shippers; velocity impacts the value of transfer option; auction mechanisms can be improved.

### **Agricultural Transportation Open Data Visualization Project**

Bruce Blanton, Jesse Gastelle – Agricultural Marketing Service, U.S. Department of Agriculture

The purpose of AMS is to facilitate the smooth operation of agriculture markets. Bruce's group is data driven. To that end, they have developed a platform to provide the next level of data analysis and data on the whole supply chain to stakeholders.

They typically publish charts as PDFs with excel sheets available, but the data is static and difficult to find. AMS wanted to make it more open. The new website uses dashboards to bring together all of the data in a story.

AMS wanted the data to be accessible, discoverable, and shareable.

### **Private Grain Car Issues**

Darrel Wallace, Executive Director, North America Freight Car Association

Two issues—reciprocity and OT-5 changes.

NAFCA began in 1994 to protect members' (i.e., private car owners) interests. Currently, 80% of the grain hopper fleet is privately owned. They have tens of billions invested. If the cars aren't moving, the members aren't making money.

Demurrage and accessorial charges were initiated to ensure efficient use of railroad equipment, but demurrage in the past was not enough incentive to make efficient use of customers' cars. True reciprocity would be monetary penalties for railroads who use cars inefficiently.

OT-5 has been an issue for years. The first OT-5 was issued in 1962, and a 1989 ruling led to the current situation. The online process is problematic; OT-5 was not meant as a capacity planning tool.

NAFCA contacted AAR, and a joint group agreed OT-5 is not working. Under the new system, railroads will no longer approve private cars.

New System: OT-57. Phase 1 will be the registration of cars; Phases 2-3 will be enhancements. Information provided will be car initial and number, contact information, and storage locations. Cars can operate on any line in North America.

OT-57 will be effective Jan 1, 2020, and OT-5 will be turned off on Feb. 1, 2020.

After four business days, a railroad can send a rejected car to a storage location. There will not be any verification of storage locations. Railroads will be in charge of contacting and communicating; if no room, the railroad will ask where to go.

### **Nominations for NGCC Officers**

Jarad Farmer was elected Vice Chair, and Mark Huston was elected to continue in his role as Second Vice Chair.

### **Shipper Panel**

Moderator: Bruce Sutherland, MAC

### **U.S. Domestic Market Supply & Demand Dynamics**

Chris Eglund, Bunge

Brazil is set to overtake U.S. in bean production, and Argentina and the U.S. are both going to see reduction in stocks. Will see a steady growth in bean consumption, but China bean imports are way down

due to the impact of African swine flu. (Down even more from U.S.—2 metric tons down from 36.) The beginning of the recovery is expected in the first quarter of 2020, with full recovery in 3 years. Lower corn and wheat yields, and bean production is down. Domestic demand for soymeal is strong. For corn, Brazil, Argentina, and Ukraine are all the same overall, but U.S. production is down.

For U.S. corn supply and demand, there's no acre change, the average report was lowered, and yield could finish under 167. Carryout remains very strong. For U.S. feed, corn is down, wheat is up—lot of excess wheat.

**U.S. Western Outlook** – Brad Hildebrand, Cargill

**U.S. Eastern Outlook** – Ross Trentadue, Zen-Noh Grain

Brad and Ross covered the West and the East, respectively. For corn, the East had a bad crop, while the West had an average year. Kansas had a great crop. Basically an average year. South Dakota and Minnesota had wet planting seasons. The Midwest was hit hard. A midwestern drop in production means that the Midwest will not be able to supply the Southeast market this year, and we will see a West to East corn flow, which is not typical. The West does not have as much private equipment, and train sizes are smaller in the East. Both sides of the river will need to work with each other.

The harvest will be late, but no major issues like frost foreseen. Farmers are not happy with prices. They are underwater and expecting more subsidies. They will store grain and use subsidies for cashflow, and they are looking for space and more space. The elongated harvest will be favorable to transportation.

### **Railroad Reports**

Moderator: Doug Story, Watco

#### **Union Pacific**

Well-positioned to handle the harvest; service is on pace for a record performance. They are having harvest planning meetings. Trip plan compliance was at 68%, and order fulfillment was at 94%, both of which are improvements. Daily service issues are down. Customers are noticing improvement.

In terms of current demand, they have enough locomotives (2,000 in storage), and no maintenance-of-way programs are expected to impact service this fall. There will be impacts in the Pacific Northwest and Gulf due to trade tariffs. UP has transitioned some small unit train business to manifest.

UP is through with three phases of its Unified Plan Schedule, so through with big changes.

#### **Norfolk Southern**

NS is ready for the harvest. They have 3,170 locomotives with 571 in storage. NS is reducing the headcounts of its T&E employees due to reduced train starts, but they have not cut to where they can't grow. NS has 32 grain car sets, with 25 active for harvest. Cycle times are 11.6 days for system and 12.8 days for private—a 41% improvement.

NS is continuing to invest and converting unit train traffic to manifest, but trying not to negatively affect customers when switching. Re: embargoes, NS is right-sizing service.

#### **Canadian Pacific**

CP has 775 new employees, 4,350-4,420 TYE employees, 1,100-1,150 locomotives in service. More than enough resources. New high capacity covered hoppers are coming. 88 sets running today. They have good metrics—dwell down 4%, speed up 3%—with no network changes anticipated.

#### **Kansas City Southern**

KCS had a service blip last year, but feeling pretty good this year. They have reduced their car fleet from 6,015 to 5,226, with 150 new cars coming in September and 70 coming in October. They have handled 7% more business with a smaller fleet and are turning more trips per month. They are not a major player in



exports, except for Mexico, which they see as domestic business. They have seen a shift of soybeans to Mexico instead of the Pacific Northwest.

### **Canadian National**

Reviewed resources. Crew is flat at 2,010 T&E as of late August. 14,150 hoppers for unit and manifest; taking new cars. Cycle times and velocity are good. An inversion is going on, with the US quiet and Canada not quiet. PTC: Completed requirements for FRA 2020 extension; 20k PTC trips, 99% successful. CapEx is up, and CN is building 80 miles of double track this year.

### **CSX**

Agriculture is 11 percent of CSX's business, 93% feed and 7% export. Working with Western partners to get grain imports, and also getting grain through Wilmington. They have 55 90-car sets. They are offering incentives to load/unload within 15 hours or less. Service is at historic levels, and they have plenty of resources. 2019 CapEx is \$1.9 billion. 100 percent PTC compliant.

Someone asked about a sale near Syracuse and whether there would be more divestment. CSX is looking at their footprint to see where density is not there.

### **BNSF**

Refer to notes for the numbers. No significant changes to operations or facilities. Rough time in 2019 due to wet weather. They are hopeful that demand will come back and are ready for harvest with 29,000 hoppers, 6,000 stored, and 7,400 locomotives, 600 in surge/stored. 1,300 TYE in furlough. They have 106 sets today, which is down from 140 sets last year. They are committed to the unit train model, but trade uncertainty makes it difficult to plan resources.

### **Genesee & Wyoming**

Power and cars are mostly provided by Class Is. G&W is well staffed, and they are making no CapEx changes. They have no plans to change operations due to the acquisition. PTC effect is minimal, but the tariffs have affected traffic.

### **Iowa Interstate**

They have an adequate number of hoppers and are ready for harvest. PTC will be ready by the deadline. They have new locomotives and have had robust hiring over the last couple of years as the Class Is hire away talent.

### **Rio Grande & Pacific**

Had a 45-day shutdown in Nebraska in March/April due to bomb cyclone. They will be announcing a new Utah line acquisition in 30 days. PTC is fully operational. They have plenty of crews and plenty of cars.

### **Montana Rail Link**

Ready for harvest. Volumes are up, but grain volume is down 8 to 12 percent. Awaiting trade developments. They have PTC voluntarily installed on main line. Maintenance-of-way will be offline by 10/1/2019 to clear for harvest.

### **Iowa Northern**

Ready for harvest. They see a robust corn crop, similar to last year. Train speeds are increasing, and fleet size is decreasing accordingly. Hiring is up. They encourage Class Is to continue PSR. PTC will be fully implemented.

### **Watco**

Prepared for harvest. 160 locomotives, 1625 covered hoppers.

## **Rail Equipment Overview**

Rob Zmudka, GATX

GATX has 148,000 cars worldwide, 122,000 in North America, with 99% utilization in North America. The cars are 50% tank, 50% freight, with 34% covered hoppers in the North American fleet. GATX has invested \$1.5 million in freight billing automation.

Carloadings are down; velocity is difficult to keep consistent, but up year-over-year. There have been recent spikes caused by ethanol and frack sand, but not many cars need to be built right now. Medium cubes go through cycles—build a bunch, take a break.

The fleet needs to get right-sized, and when it does, expect 4750s to be scrapped at some point. The overall fiscal projection is that it looks like a replacement cycle year. The idle fleet count has gone up. For new entrants, grain cars are easy to speculate on; there is currently an oversupply. Eventually, 4750s will be phased out in favor of the 5200s, then to modern short cars, but the loads are not there right now.

In summary, carloadings are down, velocity is up, tanks remain steady, and freight is a “struggle.”

### **Closing Remarks**

STB Chairman Ann Begeman thanked everyone, including Sharon, Doug, Mark, Patrick, Lisa, and Fred, for their work preparing for the meeting, and noted that the Board had that morning issued rule change proposals. She asked NGCC members to come talk to the Board members.

STB Vice Chairman Patrick Fucks echoed Chairman Begeman’s sentiments and highlighted the Board’s ex parte rules.

STB Member Martin Oberman expressed his thanks.

Outgoing NGCC Chair Sharon Clark and incoming NGCC Chair Doug Story adjourned the meeting.











## 2019 Railroad Statistics

### Class I Railroads

#### BNSF

##### Fleet

- Ag Hopper Fleet is at 29,300 cars for 2019. The makeup of the fleet currently is 80% high cube capacity, or 23,300 cars. 20% of the total fleet remains at 4750 cubic capacity, but that number continues to be replaced with the larger cars on a yearly basis. Although this varies slightly depending on time of year, the Ag hopper fleet is almost evenly split between unit and single car service.
- Capital hopper purchases for 2019 will be a total of 1,263 cars. This is up slightly from the past couple of years, with 840 and 1080 the past 2 years respectively. BNSF is still evaluating the level of cars we will acquire for 2020.
- The current shuttle set count is at 106. This increases to 137 sets by mid-October. Shuttle sets have been cycling between 2.4-2.6 trips per month for most the past year, except for February/March where it was closer to 2.0.

##### Locomotives

- The current active fleet is at 7,436 locomotives, of which 80% are high horsepower units. The storage fleet(surge) is at 515 units today, but we are in the process of putting an additional 60 to a new target of 575 locomotives. The capital plan calls for an additional 500 unit to be acquired between 2020-2024.

##### Manpower

- The 2019 hiring plan is for a total of 314 TY&E employees, this is down significantly from last year's plan of around 2200. Presently, we have a total of 1,336 employees in furlough status, this is evenly split between the North and South regions. The hiring plan for the upcoming year is still being reviewed.

##### PTC Status

- BNSF has completed installation of all PTC infrastructure on all 88 required subdivisions, or about 11,500 miles of track. In addition, over 5000 high HP locomotives have PTC capability. Approximately 80% of all traffic running on BNSF operates with PTC technology.

##### Capital Investment

- This year, BNSF will spend \$3.57B on replacement capital, equipment purchases, and expansion projects. Approximately 21% of this total(\$760m) will be for expansion and efficiency projects.

#### Canadian National

##### Resources:

- CN had an inventory of approximately 1,975 high- and mid-horsepower locomotives as of early September 2019, compared to approximately 1,875 high- and mid-horsepower locomotives at the same time last year. CN currently has approximately 125 high- and mid-horsepower locomotives in storage. CN has taken delivery of 200 of 260 new Tier 4 high horsepower locomotives from GE Transportation.

- As of late August 2019, CN qualified crew personnel in the Southern Region stood at approximately 2,660 compared to approximately 2,610 at the same time last year. Across the CN network, qualified crew personnel stood overall at approximately 8,075 compared to 7,175 at the same time last year.
- Overall at the end of August 2019, the CN hopper car fleet for grain service stood at approximately 14,150, of which approximately 1,500 hoppers were focused primarily on grain service in the US. These cars are made available for manifest and unit train service. CN has taken delivery of its first 500 new-generation, high capacity 5431 cubic foot hopper cars and will take delivery of another 500 between January and July 2020.

#### 2-4. Unit/shuttle trains and associated metrics:

- The number of CN-supplied unit trains expected to run this fall in grain service in the US will be dependent on customer demand. Customers can secure unit trains through CN's car auction or by placing general orders for CN-supplied equipment.
- Cycle times and velocity for grain unit trains, whether CN-supplied or private unit trains, has been consistently strong ex origins in Iowa and Illinois. For more specific information on service metrics, please refer to data provided to STB and provided for on STB website.
- CN is current to customer demand for CN-supplied hoppers.

#### 5-6. First mile/last mile service / car trip plan compliance:

- No specific initiatives / items to report.

#### 7. Current PTC status:

- CN has completed FRA infrastructure requirements for 2020 extension. 100% of crews are trained, locomotives are mission capable, towers and radios are installed and wayside infrastructure is complete. CN has received conditional FRA approval that enables interoperability testing with other railroads.
- CN filed its extension application with the FRA on November 7, 2018 and received approval on January 3, 2019.
- In 2019, CN has successfully achieved 32 subdivisions in PTC Revenue Operation (target is 35 by 2020)
- CN has over 20,000+ PTC train trips in revenue operation to date, 97.5% of CN's PTC trips completed successfully without penalty braking. CN is voluntarily upgrading all PTC track to Centralized Train Control (CTC) to improve average train speed and safety. CN is committed to meeting 2020 regulatory deadlines.

#### 8. Expected CAPEX

- CN is following up its record CAD \$3.5 billion capital expenditure program in 2018 with a CAD \$3.9 billion capital expenditure program in 2019, with special emphasis being placed on increasing network resiliency and adding network capacity Edmonton - Prince Rupert, Edmonton - Vancouver, Edmonton - Winnipeg, and Winnipeg - Chicago.
- In 2019, CN is investing USD \$696M in its U.S. network. Specifically, between Winnipeg and Chicago, CN is putting in 8 miles of double track at Hawthorne Hill on the Superior sub and adding a 12,000 foot siding at Glendale on the Rainy sub. Both projects are on track for completion in Q4. The Fulton drop table was also completed earlier this year and is in service.

## Canadian Pacific

### Resources

- CP has hired crews and increased its locomotive fleet size through its modernization program. Since 2016, CP has grown its workforce by 12% (1,342 employees), adding more than 700 last year. Currently we have more than 775 new employees in various stages of training, systemwide.
- CP is undertaking a robust locomotive modernization program; we've modernized more than 130 locomotives in the fleet. Equipped with the latest technology, these locomotives will significantly improve reliability and performance. CP is planning to have 170 locomotives modernized by the end of 2019.
- For the upcoming crop year, CP is targeting 1,100-1,150 locomotives in service, up to 15,700 grain hopper cars and 4,350-44,200 T&E employees. CP's fleet will be more than enough to accommodate the expected crop.
- Our grain hopper cars are used interchangeably within Canada and the US. This flexibility allows CP to maximize empty spotting at all elevators across our system. More than a third of the fleet is projected to be utilized in the U.S. this crop year.
- In June 2018, CP announced plans to invest more than a half billion dollars in new high-capacity grain hopper cars over four years, as part of our commitment to the agricultural sector. Our grain customers can expect to see more than 1,900 new cars in service before the end of 2019, enabling CP to transport more grain in each dedicated train. CP currently has 1,400 new high-capacity hoppers in service. With the new high-capacity hopper car, a train of the same length as our 7,000 foot standard will have 16% more capacity
- 88 shuttle trains or UGT anticipated to operate during harvest. Shuttle cycle times - Over 2 spins per month.

### Car and train velocity

As reflected in our Q2 2019 earnings report, our operating performance continues to improve and we've seen industry leading volume growth. For Q2:

- Terminal dwell improved 4% YoY
- Train weights and lengths improved 3% YoY
- Train speed improved 5% YoY
- We've had record operating and safety performance
- FRA personal injuries improved 30% YoY
- FRA train accidents improved 25% YoY
- Cycle times to the PNW are expected to be 2 to 2.5 trips per month.

### Current PTC status

We're committed to meeting the December 31, 2020 implementation

<https://www.cpr.ca/en/about-cp/cp-and-public-policy/positive-train-control>

### Expected CAPEX

CP generated a substantial amount of network capacity over the last 5 years through operational efficiencies and investments in network upgrades. CP continues to invest to renew depleted rail assets, improve network productivity, and support future growth. CP expects its total 2019 system-wide capital expenditure to be approximately \$1.6 billion. This significant investment builds on our record 2018 capital program which was also \$1.6 billion. Since 2017, CP has increased annual capital expenditures by 120% to meet the demands of our customers, improve safety and enhance efficiency. This investment has outpaced growth in our GTMs and outpaced GDP growth over the period. Continued network upgrades will drive further productivity and capacity improvements.



Questions:

Any network changes over the past 6 months and next 6 months including yards closures and/or conversions.

No major network changes. There are no plans to open, close or convert any yards in the next 6 months, nor were there any in the prior 6 months. We do continually work to optimize and enhance efficiency in each of our yards. A reconfiguration and expansion of our Shoreham Intermodal Yard in Minneapolis which will increase capacity is underway.

Shift away from unit train service towards manifest service, particularly for grain shippers. Impact of longer turn times and increased private car fleets?

CP has not shifted away from unit train service; we strive to provide service to our customers regardless of size of grain shipment, destination/lane etc.

Frequency of service for individual customers (particularly for grain shippers) and changes in weekend service

No, nothing we've stated publicly regarding frequency of service and changes to weekend service.

Impact of trade tariffs and/or changes in trade agreements – shifts in traffic patterns of grain exports (e.g. away from the PNW and toward the Gulf)?

We have seen fewer PNW exports than one would expect in a typical year; we are working with our customers to move traffic

Plans to keep/grow agricultural business?

Grain comprises 22% of CP's book of business and is the largest individual business unit within our portfolio. We just delivered a record year for grain volumes in Canada in 2018-19 (moving 26.8MMT) and are ready to move our US customer's freight in a variety of corridors, notwithstanding trade dynamics, export embargos, etc.

Use of embargoes to reduce online inventories of individual shippers

It's a measure we use rarely and only when absolutely necessary, in order to protect our network and our customers shipments.

**CSX**

CSX is ready for harvest and is well positioned to meet all freight demand in the Agricultural products space.

- Service metrics in 2019 remain consistent, at levels that are the best in CSX's history
- System Train velocity in the 20-22 mph range, as compared to 17-18 last year.
- System Dwell in the 18-20 hour range, similar to last year
- Trip plan compliance on the scheduled network is ranging from 78-81% currently

CSX has sufficient locomotive, crew, and car resources available to meet harvest demand

- ~2,500 active locomotives with 700 stored serviceable.
- ~7,500 active T&E employees with 170 furloughed. Plan on hiring 350 conductors in next 12 months – 1/3 in the key grain origin & destination locations
- CSX expects to operate approximately 55 unit grain trains (90 cars each) on our network this harvest. We have 3500 covered hopper cars available for unit grain service and single car Merchandise Service. We expect approximately 78% of the equipment to be in unit train service with the balance available for single car shipments. This capacity currently exceeds our demand.
- In partnership with our customers we continue to focus on our grain express programs which provides an economic incentive to load/unload a train in 15 hours and allows us to leave the

locomotive power with the train and adequately plan our crew resources. We currently have ~75 participating locations in our Express program.

- In addition to our express programs, we are entering the second year of train commitment program which allows our customers complete control of a RR set in exchange for the commitment to run the cars 12 months per year. We are also introducing a train auction program this year for customers who are unable to commit to a full year of utilization.

There have not been any significant network changes, yard closures, or yard conversions recently, nor are any planned.

CSX continues to invest in infrastructure to ensure reliable capacity

- In 2018, CSX invested \$1.75B in capital expenditures, increasing our capital investments in our core track network from \$714M in 2016 to \$773M in 2018.
- As guided externally, 2019 capital expenditures are expected to be in the \$1.6B - \$1.7B range.

CSX has completed PTC implementation

- CSX successfully completed PTC installation and activation across our network. We now operate nearly 13,000 PTC-equipped track miles and are on pace to have the system fully-tested and operational with our tenant railroads ahead of the required 2020 deadline.
- CSX estimates that total PTC company investment will near \$2.5 billion.
- The company has equipped 1,800 locomotives with PTC, installed 423 new radio towers and 4,400 track-side communication units.
- Interoperability testing with other carriers continues

## **Kansas City Southern**

### **Resources**

Our total U.S. locomotive fleet is 555 units with 527 in active status. Last year, our total U.S. fleet was 613 units. In September of 2018 our crew base was 1,296 and today we have 1,352 with zero on furlough. We have had a 4% increase in crews year over year. Our current grain fleet is 5,226 cars. We will be receiving 150 additional cars in September and 70 additional cars in October. Our fleet will be 5,446 cars when all cars are received. Last year at this time our fleet was 5,773 cars. We've reduced the grain fleet 6% (327 cars) year over year. KCS has determined that the unit grain train service that KCS offers does not constitute grain shuttle or dedicated grain train service, nor does KCS cycle unit grain trains routinely between the same origin-destination pair. While we do not necessarily run shuttles or dedicated trains on our network, at any given time we would estimate that 60% of our fleet is in train service and 40% is in manifest service.

### **# shuttle trains or UGT anticipated to operate during harvest**

As stated above, We do not necessarily run shuttle or dedicated trains on our network. We try to match car orders with network fluidity and train movements. At any point in time we will have +/- 40 trains operating in our grain service.

### **Shuttle cycle times**

For the year, our covered hopper fleet (shuttle and manifest) is turning at 1.29 TPM however in July we turned the fleet at 1.36 TPM and August was 1.42 TPM.

Historic turn times - - - 2015 (1.05), 2016 (1.18), 2017 (1.11) and 2018 (1.14). Our cycle times on the covered hopper fleet are up 13% year over year.

### **Car and train velocity**

2nd quarter gross velocity 12.5 MPH – a 9% improvement from 2nd quarter 2018. We are now operating at 14.8MPH. 2nd Quarter dwell 21.2 Hours – an 11% improvement from 2nd quarter 2018. Our dwell is now 20.4 Hours

### **First mile/last mile service**

We are currently developing this metric.

### **Car trip plan compliance measure**

For trip plan compliance metrics we consider “on-time” as up to two hours late. On-time origination, YTD is 84.4%. For the last month we are operating at 93.6% on-time origination. On-time termination, YTD is 55.6%. For the last month we have been operating at 70.6% on-time termination. Both metrics have continued to show improvement throughout the year.

### **Current PTC status**

We are 100% implemented on locomotives, track segments, towers, employees and route miles. We are conditionally certified and currently working on interoperability. KCS continues to make progress with our tenants on interoperability. We have established testing dates and

plans with each tenant and have begun interoperability testing. The tenants that are required to equip with PTC on KCS are: UP, BNSF, Amtrak, CN. While CP, CSX and NS do not operate on the KCS as a tenant we do expect to see their locomotives in the lead position of a train we will see at interchange and will be working with each to ensure we have fully tested that scenario with each to ensure smooth operations.

#### Expected CAPEX

In 2019 we are expecting to spend just under \$600M in capital which will equate to near 21% of revenue. Looking forward we expect to spend approximately 18% of revenue annually on capital through 2021.

#### **Union Pacific**

##### Resources

- UP has a total locomotive fleet of approximately 8,000 locomotives, of which around 2,300 are stored
- Through the first half of 2019, UP's FTE count is down 6% year over year (on 3% lower carloads)
- The total grain fleet size is around 15,000 cars, with 1,800 of those in storage. Around 40% of the fleet is in unit train service and 60% in single car service

##### # shuttle trains or UGT anticipated to operate during harvest

- UP expects to have around 50 unit trains in service during the 2019 harvest

##### Shuttle cycle times

- YTD shuttle times are 2.75 turns/month, which is 5% faster than 2018

##### Car and train velocity

- Freight car velocity was 199 daily miles/car in Q2 2019, which was up 3% vs 194 daily miles/car in 2018
- July 2019 freight car velocity was 206, which represents an 8% improvement vs the July 2018 number of 191
- Train speed was 23.1 miles/hour in Q2 2019 and was down 6% vs 2018 figure of 24.7 due to flooding impacts on our network and an increase in work events as a result of the shift to Unified Plan 2020. July train speed was 23.3, down 4% vs 24.2 miles/hour in 2018. UP expects train speed to continue to improve, but it may not improve as significantly as other metrics since we used to run a network that was more focused on getting the train from origin to destination and now we have shifted to a focus on moving cars. The shift to progressing the car as far as possible each day includes adding in work events on line of road which can impact the train speed while the freight car velocity and terminal dwell improve.

##### First mile/last mile service

- UP performed first mile/last mile service at 92% in July compared to 79% in July of 2018. This illustrates our commitment to deliver and pick up rail cars to/from customer facilities per our train schedule

##### Car trip plan compliance measure

- Car trip plan compliance was 68% for July 2019, which is 7 points better than July 2018, reflecting improved operating performance

#### Current PTC status

- PTC is currently installed on 100% of the required rail lines, and we continue to work diligently to execute the revised implementation plan we filed with the FRA
- We are implemented so far on 86% of the required miles and we will continue implementing, testing and refining PTC through the rest of 2019 and 2020

#### Expected CAPEX

- UP's 2019 capital plan is around \$3.2B

### **Class II/III Railroads**

#### **Iowa Northern**

##### Locomotives

- 26 locomotives (which includes 4 slugs)

##### Grain cars

- 430 grain cars (combination of 4750's and 5200's)

##### Crew Resources

- 40 operating employees

##### Car and train velocity

- Continuous movement of trains to and from processing facilities based on their needs.

##### First mile/last mile service

- Coops/Elevators served on a daily basis with no IANR service issues.

#### Current PTC status

- Well underway – installation of equipment completed in October. We will equip 20 locomotives and GE/Wabtec will establish all the back office implementation and integration concurrently. Employee training will be starting once installation is complete with 100% deployment in June 2020.

#### Expected CAPEX

- 2019 approximately \$7,000,000

#### **Montana Rail Link**

Montana Rail Link (MRL) is committed to the safety of our employees, customers and general public. We are in the midst of a record safety year with an injury frequency rate of .48. This is the lowest in the company's history. Our FRA reportable accident rate is near a record low and stands at .95 with only four reportable accidents YTD. Our focus is on safety and we have implemented various new programs to promote employee engagement and ownership. We are proud of our results and will not rest until we have zero injuries and accidents.

MRL is a class II regional railroad that operates over 900 miles of track in Montana and Idaho, including 655 miles of mainline track from Jones Junction, MT to Sandpoint, ID. In 2018, MRL shipped 440,000

total carloads and averaged 20.8 trains-per-day. 102,250, or 23.5%, of our total volume was grain, up from 86,000 carloads in 2017. Of the 2018 total, 5,188 carloads were originating traffic from Montana based grain shippers. MRL services 24 local grain shippers located in Eastern and South Central Montana. The majority of grain shipped across our line is corn and soybeans that originate in the Midwest.

2019 grain volumes, through Q2, are down 12.8% as compared to 2018, primarily due to escalating international trade tensions.

MRL currently operates 71 locomotives, including four new SD70 ACe's added last year. MRL owns 700 railcars, of which 106 are grain cars.

MRL has 1,223 employees and in the past four years has hired 437 new employees. We have added 109 new employees in 2019 with plans to hire 22 additional transportation employees each quarter. MRL's 2019 capital budget plan is \$87 Million, the largest in the company's history, including:

- 160,000 ties
- 25 miles of new track
- 285 miles of surface work

Capacity improvement plans include a new siding at Bradley, extended siding in Dixon, a new cross-over at Desmet, adding CTC at the Phosphate siding and expansion of our Logan yard. MRL is also investing several million dollars in a state of the art petroleum product facility located in Park City, MT to offer new transload services to our customers.

MRL is also beginning the process to voluntarily install PTC across our mainline network. Preliminary work has begun and the project is expected to be completed in 4-5 years.

MRL continues to monitor international trade tensions and the potential impact to grain shipments across our network. We are currently experiencing a record grain year for Montana on-line shippers and our customers are forecasting a strong wheat, barley and pulse crop harvest this fall. MRL stands ready to provide safe and reliable service to our Montana and regional grain shippers.

**Watco Railroads** – Railroads with grain traffic include KO, SKOL, DREI, WSOR, GDLK, AA, PCC, EIRR, ARS, and MSR

Locomotives

- 160 locomotives across all railroads

Grain Cars

- 1675 covered hopper fleet across the KO, SKOL, WSOR, DREI, and PCC
- Shuttle trains across the WATCO network utilize Class I power and equipment

Crew Resources

- All Railroads are fully staffed for Harvest

Harvest Outlook

- Corn planted acres are down and yield is expected to be down based on late plantings

- Soybean planted acres are down and yield is expected to be down
- Trade issues are making it very difficult to predict when this crop will move and where it will go



# *Dynamic Changes in Rail Shipping Mechanisms for Grain*

**Sept 12 2019**  
**STB National Grain Car Council**  
**St Louis, Mo.**



By Dr. William W. Wilson  
CHS Chair in Risk Management and Trading  
*University Distinguished Professor*  
[William.Wilson@ndsu.edu](mailto:William.Wilson@ndsu.edu)  
701 231 7472

Dept of Agribusiness & Applied Economics  
North Dakota State University  
Fargo, USA



# List of studies

- **Dynamic Changes in Rail Shipping Mechanisms for Grain, Competition**
  - **Agribusiness and Applied Economics Report No. xxxAugust 2019**
- Prithviraj Lakkkakula and W. Wilson. 2019. Analysis of Panel Basis in U.S. Grain Shipping,
  - Department of Agribusiness and Applied Economics Report No. \_\_\_\_.(*forthcoming*).
- Prithviraj Lakkkakula and W. Wilson. 2019. Simultaneity of Basis and 2<sup>nd</sup> Car Market Values,
  - Department of Agribusiness and Applied Economics Report No. \_\_\_\_(*forthcoming*).
- Bullock, D. and W. Wilson 2019. Factors Impacting the Export Basis for Soybean,
  - Department of Agribusiness and Applied Economics Report No. \_\_\_\_ (*forthcoming*) and, paper presented at the 2019 NC134 Annual Program, Minneapolis, April 2019.
- Landman, D. and W. Wilson. 2019. Real Option Values of Rail Car Guarantees,
  - Department of Agribusiness and Applied Economics Report No. \_\_\_\_ (*forthcoming*).
- Klebe and Wilson, 2019 Optimal Grain Purchasing Strategy Under Risk, 2019,
  - North Dakota State University.



# Elements of the Problem

- Grain shipping involves many sources of risk and uncertainty including forward contracting instruments.
- Pricing mechanisms have evolved for most rail carriers in the US.
- Operations and impact of these mechanisms are not well understood, but yet are frequently subject of public criticism and studies,
  - at the same time revered by (some) market participants.
- *Important functions of these mechanisms are*
  - allocating capacity across shippers, temporally/seasonally, geographically,
  - determining price or value of the service,
- Purpose:
  - provide a comprehensive review, description and analysis of these mechanisms.
- **Specific objectives are:**
  - Document the evolution and operations of these mechanisms over time and across carriers;
  - Determine and describe the impacts of these practices on basis, both spatially and temporally, and on trading firms and other market participants;

## Background

- **Alternatives for allocation function**
  - Random
  - Contracts
  - Historical shipments
  - First-order-first served
  - AuctionsEach have (are) been used in rail grain.
- Allocation using some form of an auction system **is more efficient** in terms of assuring cars are allocated to shippers with the greatest value.
- Other countries:
  - Varying forms of government-imposed regulations/penalties imposed on RR for late service (does not assure service, only *ex-post* penalties)
  - Simply be late for shipments

## Functions of Rail Car Markets

- **Allocation**
  - Among shippers
  - Temporally: Spot vs deferred shipments
- **Price discovery and transparency** (signals)
  - Shippers: when to ship, store vs ship
  - RR's
    - Temporal demands/shipping strategy
- **Mechanisms for Risk Reduction**
  - Rate risk
  - Quantity risks

# Car Allocation Mechanisms Facilitate Important Functions

# Rail Car Market: Summary

Feature	Primary	Secondary
Allocation mechanism	Bid to buy from Railroad	Acquire from brokers or other shippers
Quantity allocated	Bid on 12, 24, 36 months of trains by month	Offers by other shippers
Tradable	Yes	Yes
Quantity	Receive $V \cdot N$ where $V$ is rail cycle (e.g., 2.9 trips/month random) and $N$ is number of trains	Amount purchased
Car placement	By period (10 day) s.t. car cycles	Assured, by period (10 day)
Guarantee	None	Yes (negotiable)
Cancellation	s.t. penalty	None (re-sell in 2 <sup>nd</sup> market)
Price	auction: Average=54\$/c s.t. min	Market: Average=\$225; no min/max



# Rail Car Market: Taxonomy

- **Primary market:** Initial rail car auction from RR
  - Weekly
  - 12-24 months forward
  - Other terms
- **Secondary market:**
  - Brokerage
  - Offers from buyers (e.g., CHS, etc.) as part of procurement
- **GrainCO:** has 3 ways to make trades of trains in secondary transactions
  - used by company owned elevators;
  - sold on a trip-by-trip basis to other companies;
  - forward contracted to other companies for a set quantity, delivery period and duration.
- **GrainCO: in trades to affiliated and/or target supplier**
  - typically sells their shuttles to elevators for a premium that they paid the carrier.
  - assumes all risk and liability in regard to the cars being placed on time.

# Rail Car Markets

- Panels:

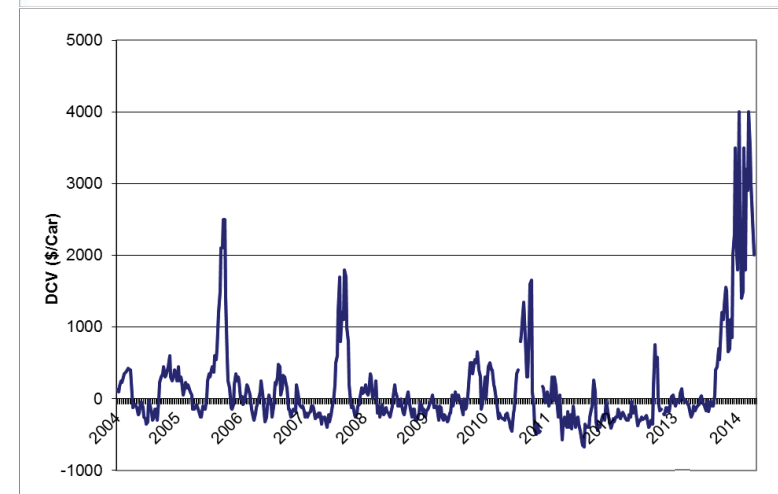
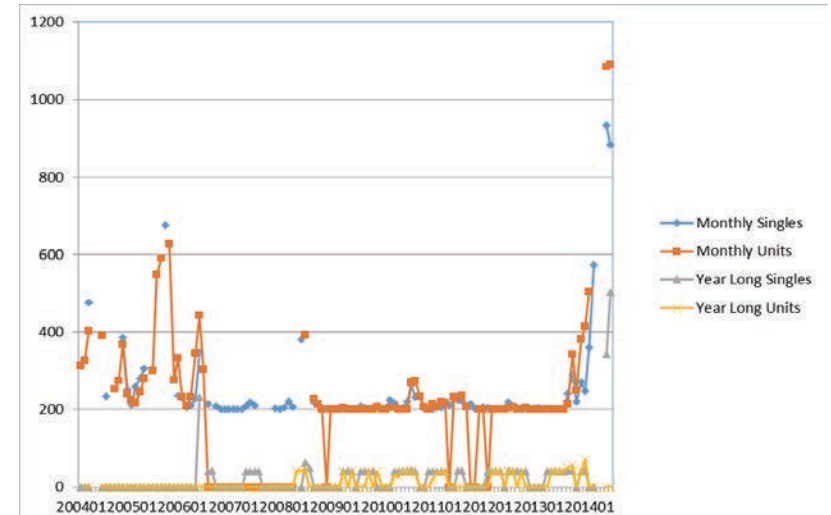
- Top: Primary auctions
- Bottom: Secondary car values (DCV)

- Critical:

- Vast majority (>90%) of primary car auctions are at nil premium \$54/car

- Secondary market changes are

- On average=n\$224/car
- More risky
- Reward original certificate holder for accruing the obligations of the instrument—



# 2<sup>nd</sup> Market Feb 11 2019

RETURN TRIP	LOOK*	-
MP FEB	\$700**	\$2000*
LH FEB	\$700**	\$1800*
LP FEB	\$700**	-
FP MAR	\$500**	-
FH MAR	\$450**	\$1000*
MP MAR	-	-
LH MAR	\$350*	\$500*
LP MAR	-	-
*PKG (1/2's) MAR	\$450**	\$700*
FP APL	-	-
FH APL	\$100*	\$250*
FH APL	-	-
MP APL	-	-
LP APL	-	-
*PKG (1/2's) APL 19	\$75**	\$250*
*PKG (1/2's) AM, 19	TARIFF*	\$100*
FP MAY	-	-
MP MAY	-	-
LP MAY	-	-
FP JUN	-	-
MP JUN	-	-
LP JUN	-	-
*PKG (1/2's)JJ	-\$100*	TARIFF*
FP JULY	-	-
MP JULY	-	-
LP JULY	-	-
FP AUG	-	-
MP AUG	-	-
LP AUG	-	-
*PKG (1/2's)AS	-\$150*	\$50*
FP SEP	-	-
MP SEP	-	-
LP SEP	-	-
FP OCT	-	-
MP OCT	-	-
LP OCT	-	-
*PKG (1/3's) OCT	-	-
FP NOV	-	-
MP NOV	-	-
LP NOV	-	-

- Nearby values inflated
- Likely due to
  - Service problems
  - Anticipated/real nearby exports soybean and HRS
- Wide B/A spread
- Inverted
- New crop nil offers

# TradeWest 2<sup>nd</sup> market Sept 2019



**\*\* BNSF 110 CAR SHUTTLE CAR MARKET RECAP \*\***

**\*(FP = FIRST PERIOD - MP MIDDLE PERIOD - LP = LAST PERIOD)**

**\*\* BEFORE BIDDING ON RETURN TRIPS, PLEASE CHECK YOUR LOADING ORIGIN WITH THE RR FOR THEIR APPROVAL; RAILROAD LOAD ORIGIN REJECTION FOR PURCHASED SHUTTLE TRIP/S WILL BE THE BUYER'S RESPONSIBILITY UNLESS STIPULATED OTHERWISE.**

**\*\* BNSF 110 CAR SHUTTLES \*\***

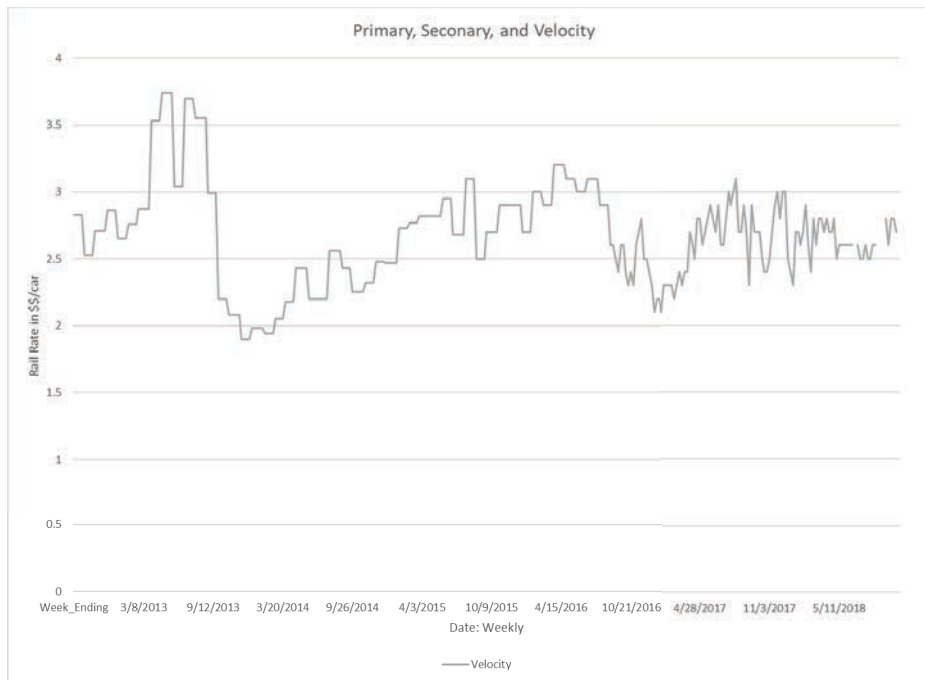
**SELLER'S CALL**

	BID (+ POSSIBLE PUSH)	ASK (- POSSIBLE GIVE)
SPOT EMPTY	-\$300*(TRAIN OUT OF THE SOUTH)	-
RETURN TRIP	LOOK*	-\$250*-
FH SEP	-\$350*	-
MP SEP	-	-\$300*-
LH SEP	-	-\$300*-
FP OCT	-	-
FH OCT	-	-
MP OCT	-	-
FH OCT	-	-
LP OCT	-	-
*PKG (1/2' s) OCT	-	-\$400*-
*PKG (1/2' s) OCT/NOV	-	-
FP NOV	-	-
FH NOV	-	-
MP NOV	-	-
LH NOV	-	-
LP NOV	-	-
*PKG (1/3' s) NOV	-	-
*PKG (1/2' s) NOV/DEC	-\$350*+	-
*PKG (1/2' s) N/D/J	-\$300*+	-
FP DEC	-	-





## Velocity: *Important Feature of Current Mechanisms*

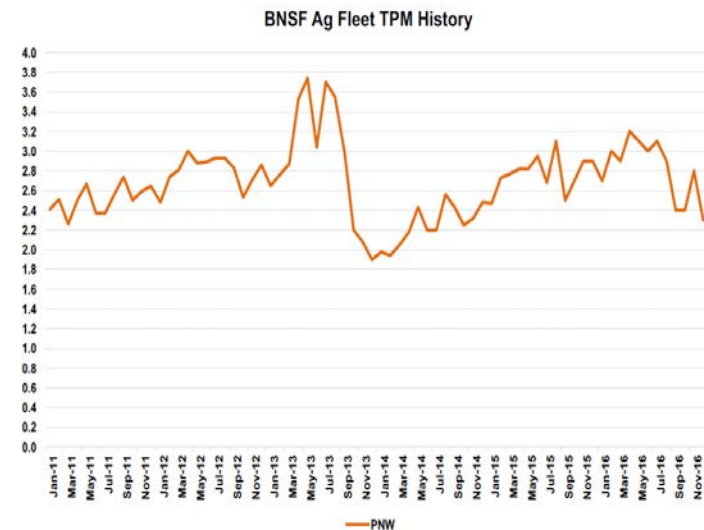


- Velocity has emerged important in managing logistics
  - Earlier years, wide range
  - More stable recently
  - Highly seasonal
- Source of risk for shippers and included in models below

# Expected Quantity per Shuttle—Primary Market

- Shipments per month defined as:
  - V=Velocity per month
    - E.g., 2.5 trips per month
    - V is random
  - Qshuttle= # shuttles bought in primary market
    - E.g.  $10 * V = 25$  trains (110 cars) per month
  - Cars: 100-110 rail option
- Role of 2<sup>nd</sup> market
  - If  $V * Q >$  shipping demand: sell on 2<sup>nd</sup> market
  - If  $V * Q <$  shipping demand: buy on 2<sup>nd</sup> market

## Rail Performance



# Comparison of Short-Term Guarantee Contracts (early 1990s)

- Common features (early period)

- Auction based
- Forward
- RR guarantee
- Shipper penalties
- Transparent
- Transferable
- 2<sup>nd</sup> market

- Others

- Allocation of cars by corridor/period

Feature	BNSF-COTS	CPRS/Soo PERX	UP Car Supply Vouchers
Forward Order Period	Up to 6 months	Up to 4 months	Up to 6 months
RR Guarantee	Full amount on 16 <sup>th</sup> day at \$400/car	\$50/car up to \$250 max/car	\$50/car up to \$400 max/car
Shipper pre-pay/Cancellation Penalty	\$300/car plus COT premium with no interest paid to customer	\$250/car Advanced Freight deposit	\$300/car plus total premium bid amount
Rate		At time of bid	Not guaranteed beyond 90 days prior to shipment

Source: Authors files, and as reported in Lee, J (1999), Applying Option Theory To Guaranteed Rail Mechanisms.

Feature	BNSF	UP	CP	CN	CSX	NS
<b>Allocation</b>	Auction	Auction	Auction	Fleet Integration	3-day bid period	na
<b>Car owner (predominant)</b>	RR	RR	RR	Private cars to CN Fleet	Private	Private
<b>Transferable</b>	Yes	Yes at \$35/c	Yes	Yes	No	Na
<b>Secondary market</b>	Yes	Yes	Yes	Not in practice	No	NA
<b>Shipment size</b>	Shuttle	Shuttle	Shuttle	Shuttle	Min 10 car/week	Na
<b>How far forward</b>	Year long	One-year	One-year	1, 2, 3-year terms	4-week cycle	
<b>Window for Placement</b>	10 days	15 days	15		4-weeks	
<b>Allocation by region</b>	No	No	No	No	No	
<b>Transparency of Primary</b>	Yes	Yes	Yes	No		
<b>Transparency of Secondary</b>	Yes	Yes	No	Na	Na	
<b>Prepayment</b>	Bid	Bid +\$300/c			Bid	
<b>Shipper Cancellation</b>	\$200/c subj to provisions	Yes	Bid + \$300/c	\$100/car		
<b>Rail Guarantee</b>	No	Yes \$50/car/day up to \$400 max	>14 days late Rail pays \$275/c if cancelled	If 10+ days late, \$100/c	No	
<b>Quantity</b>	Subject to rail velocity	Subject to rail velocity	2 trips/month; greater vel is shipper option	2 spots/month		
<b>Transfer among origins</b>	Yes	Yes	Yes		No	
<b>Other programs</b>	Non-COT unit and singles; COTs, Pulse COTS	Guaranteed freight, Vouchers, General distribution	Grain auction program;	W. Canada is separate;		
<b>Share or rail grain traffic</b>		72%	75%	50%		

## Basis Behavior: *Review of Previous Research*

- Most previous studies have examined the time series and/or fundamental behavior of basis at either the futures par delivery location or at other interior locations:
  - **Taylor et al (2006)** → analyzed time series behavior of wheat, corn, and milo basis at six Kansas locations.
  - **Hatchett et al (2010)** → analyzed time series basis behavior in Oklahoma and Texas for soft and hard wheat, corn, and soybeans.
  - **Onel and Karali (2014)** → used a semi-parametric, generalized additive model for examining corn and soybean basis in North Carolina.
  - **Sanders and Manfredo (2006)** → analyzed ARMA and VAR time series models on basis data for soybeans, meal, and oil in Central Illinois.
  - **Bekkerman, Brester, and Taylor (2016)** → tested numerous time series / fundamental basis models across 215 origins for hard wheat in the upper Midwest.
  - **Welch, Mkrтчhyan, and Power (2009)** → used an indicator of transport costs to analyze corn basis in the Texas Triangle region.
  - **Taylor and Tomek (1984)** → developed a fundamental econometric model to forecast basis at a specific New York location.
  - **Parcell (2000)** → analyzed impact of LDP program payments upon corn and soybean basis in Missouri.
  - **Lara-Chavez and Alexander (2006)** → used an event study methodology to examine impact of Hurricane Katrina on national index (NCI, NSI) basis values for corn and soybeans.
  - **Zhang and Houston (2005)** → analyzed the impact of South American soybean production and futures volatility upon the par CBOT basis.
- A few studies have focused upon export basis behavior:
  - **Tilley and Campbell (1988)** → examined impact of fundamental, time series, and event (Russian Grain Embargo) variables upon U.S. Gulf HRW export basis.
  - **Manfredo and Sanders (2006)** → tested causality between origin and export basis values for U.S. corn market.
  - **Skadberg et al (2015)** → evaluated spatial arbitrage opportunities between origin and export soybean basis values. Used a spatial stochastic optimization model and copulas to determine most likely arbitrage opportunities.

## Review of Previous Research – Basis Behavior

- A few studies have examined the impact of shipping costs upon origin basis values:
  - **Wilson and Dahl (2011)** →
  - **Econometrically: origin basis** values are impacted by
    - shipping costs
    - ocean rate spreads
    - export sales
    - railroad performance,
    - other variables.
- **Olson (2014) and Usset (2014)** → examined impact of rail disruptions on basis using analogue year analysis.
- **Hart and Olson (2017)** → (based on Wilson and Dahl) / impacts of logistics / disruptions on basis values over 2003-2016 time period.
  - ***Origin basis depends on export basis***
- **Comment**
  - Ex-post analogue by assumption
  - Origin basis
  - Origin basis depends on destination basis + 2<sup>nd</sup> car values (exogenous)



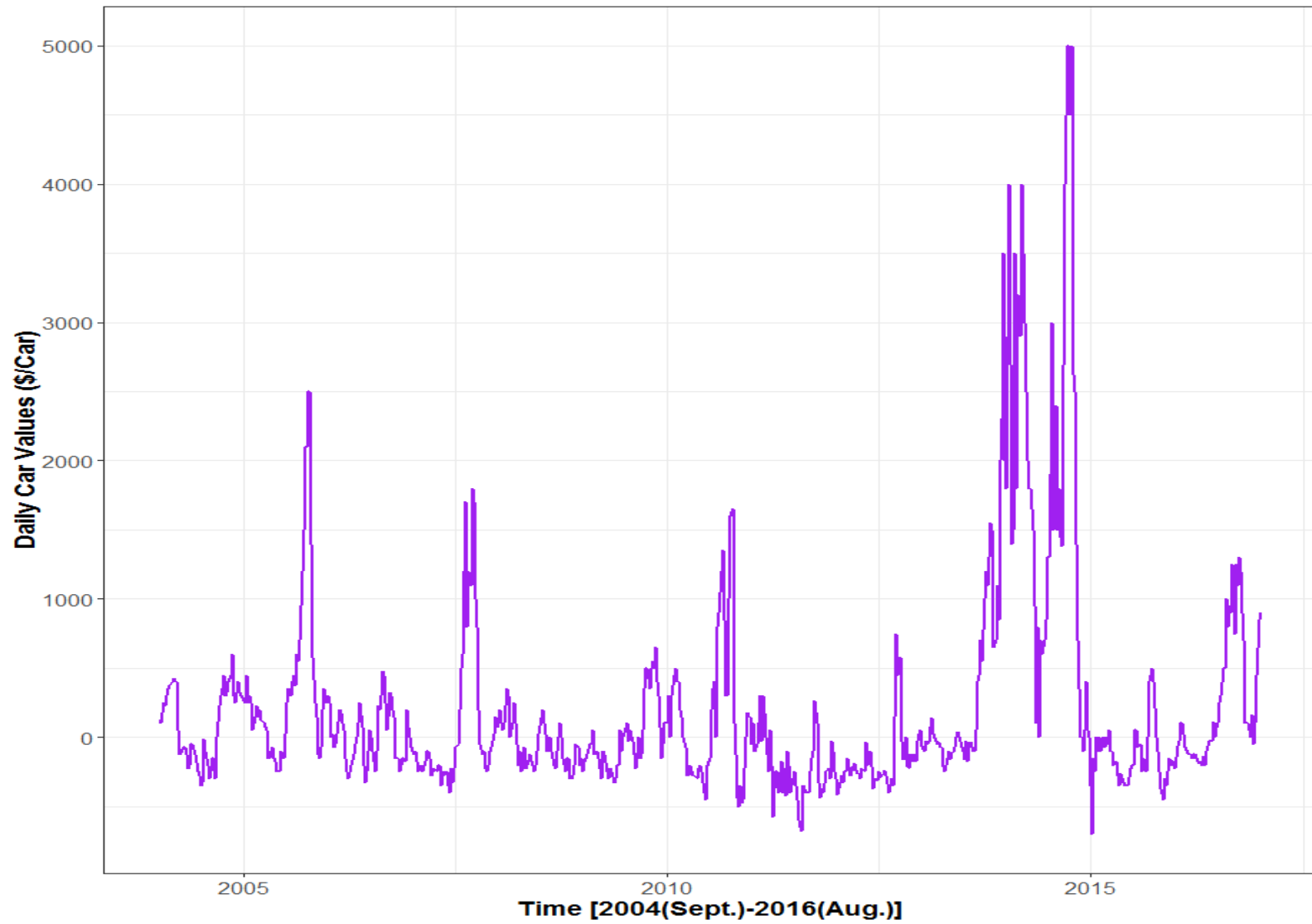
# Basis and 2<sup>nd</sup> Mkt Values:

## *Elements of Problem/Multiple studies*

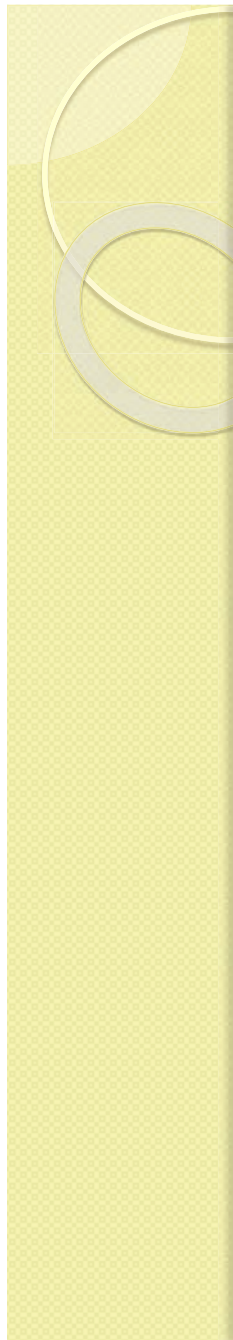
- Impact of Shipping Costs frequently ignored in Market Analysis
- Since the deregulation of railroads in 1980, alternative mechanisms for car allocation and pricing have emerged.
- These mechanisms, due to transferability, facilitated development of SECONDARY MARKET FOR RAIL CARS.
- Most previous studies treat secondary rail markets as EXOGENOUS (not dependent)
- **In practice and logistics strategy: it is clear that the**
  - *secondary market impacts the basis and*
  - *basis impacts the secondary market.*
- Econometric models to explore the variables impacting the export basis, and rail car values in the secondary market, and test hypotheses about simultaneity.
- **DATA BEHAVIOR**



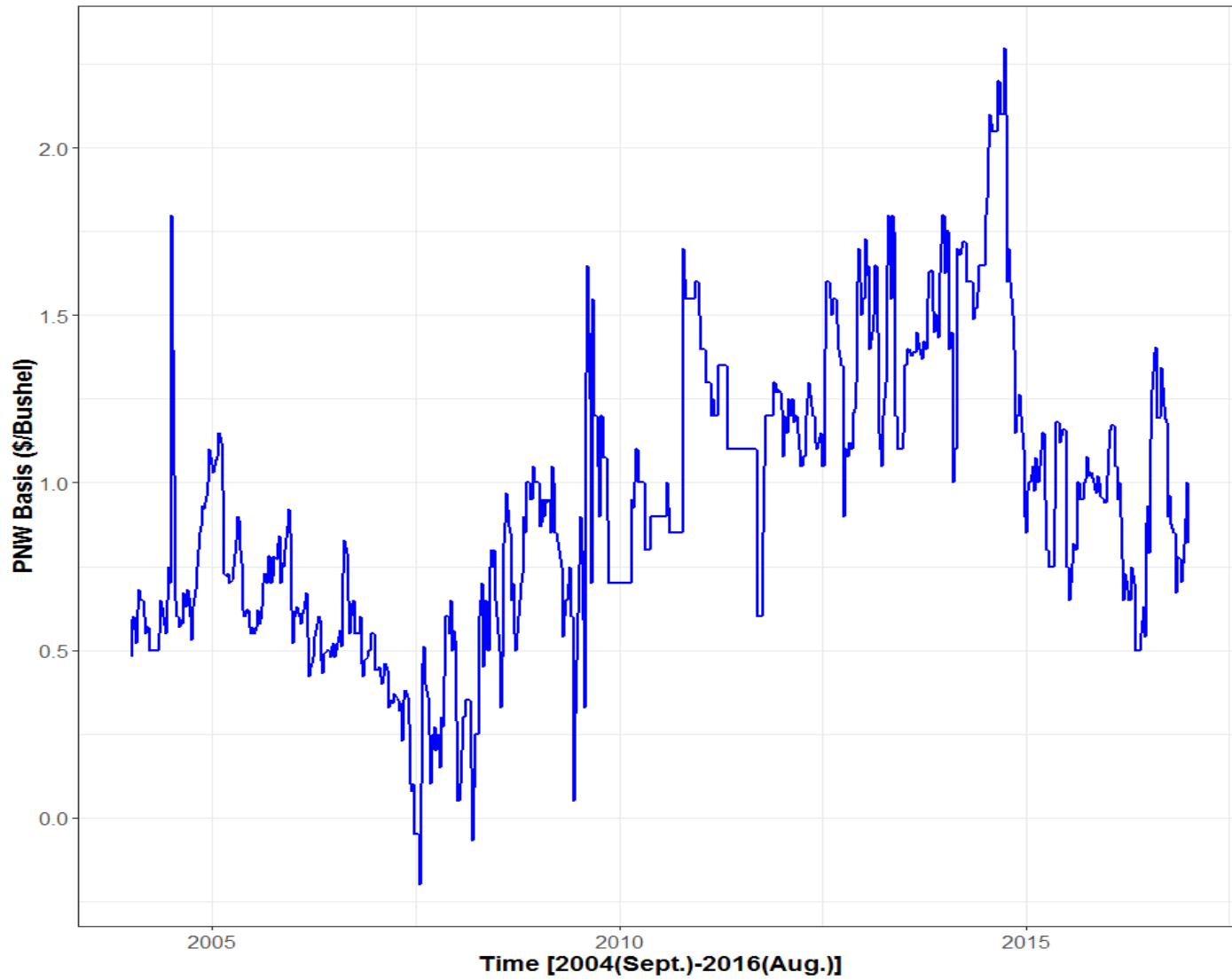
## Data Behavior: **Daily Car Value (DCV)**





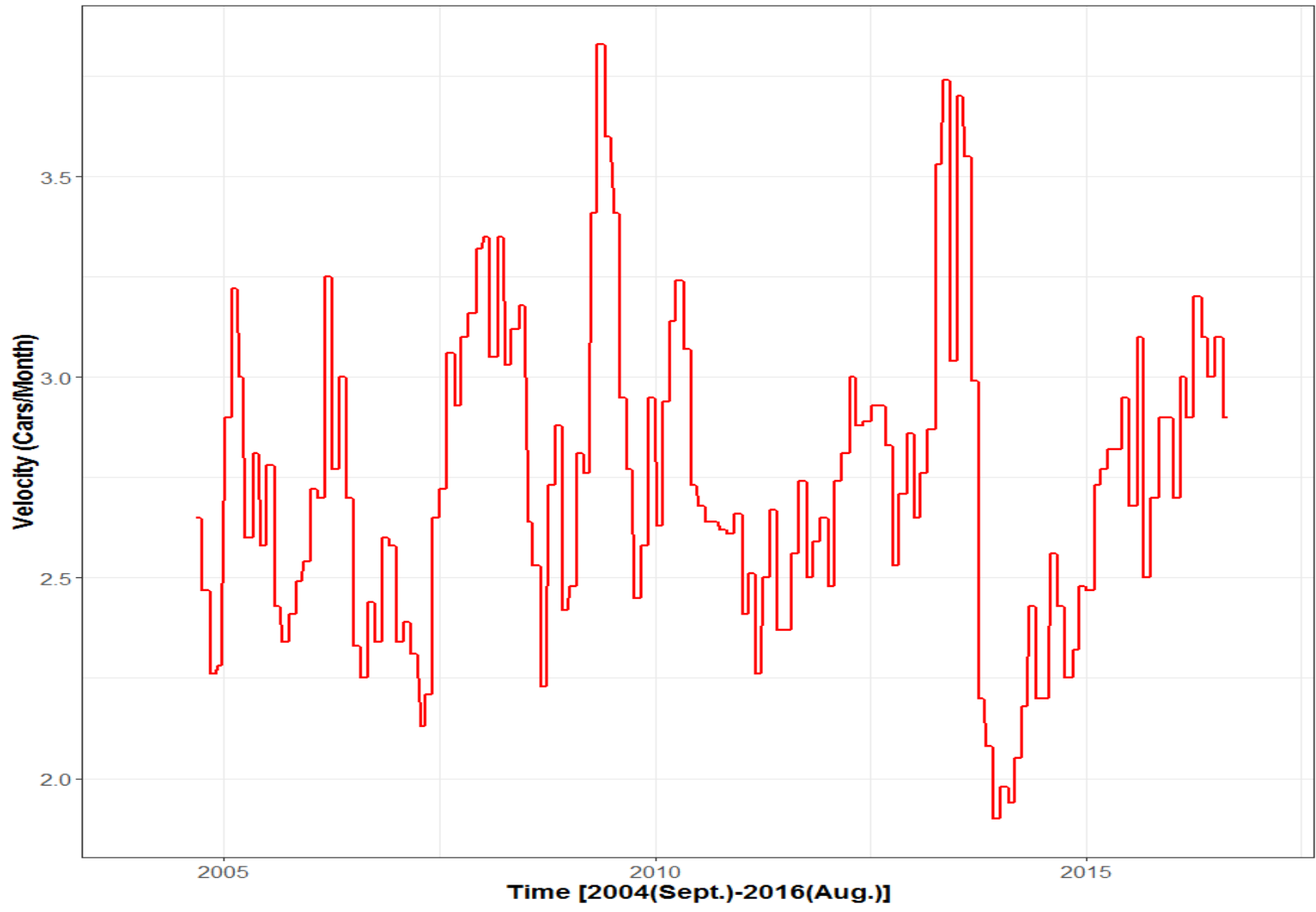


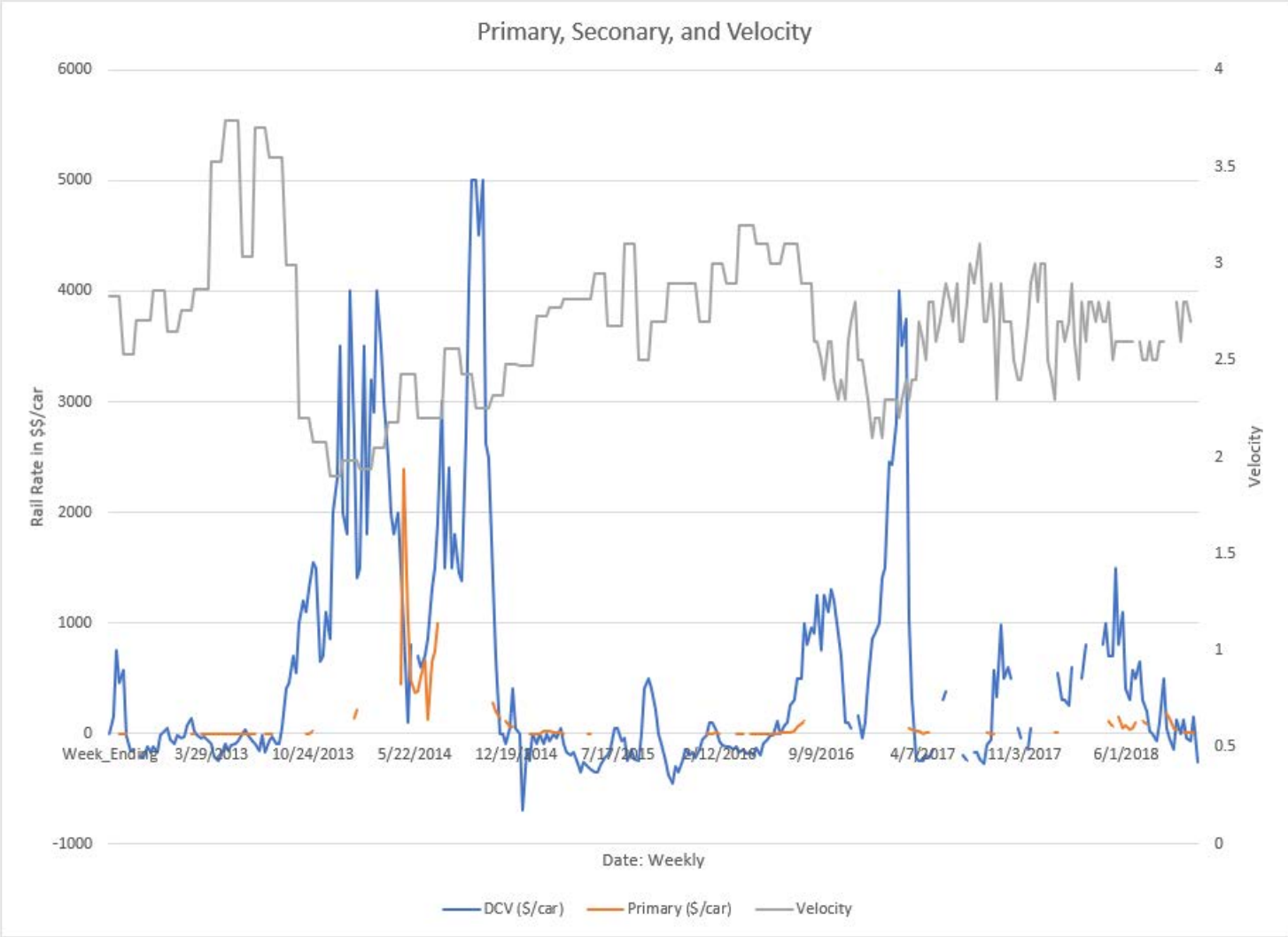
## PNW Basis





## Rail Velocity





# Correlations—Very Important!

Correlation	Basis PNW	Basis Jamestown ND	PNW-Jamestown Spread	Nearby Soybean Futures	DCV (\$/car)
Basis PNW	1.000				
Basis Jamestown ND	0.311	1.000			
PNW-Jamestown Spread	0.777	-0.219	1.000		
Nearby Soybean Futures	0.514	0.090	0.490	1.000	
DCV (\$/car)	0.500	-0.199	0.589	0.251	1.000

# Model Specification

$$B_t^{pnw} = f(B_{t-1}^{pnw}, DCV_t, FAR_t^{del}, FS_t, R_t, SDum_M) + e_{1t} \quad (1)$$

$$DCV_t = f(DCV_{t-1}, Vel_t, SHIP_{Gulf}, SHIP_{pnw}, B_t^{pnw}, SDum_M) + e_{2t} \quad (2)$$

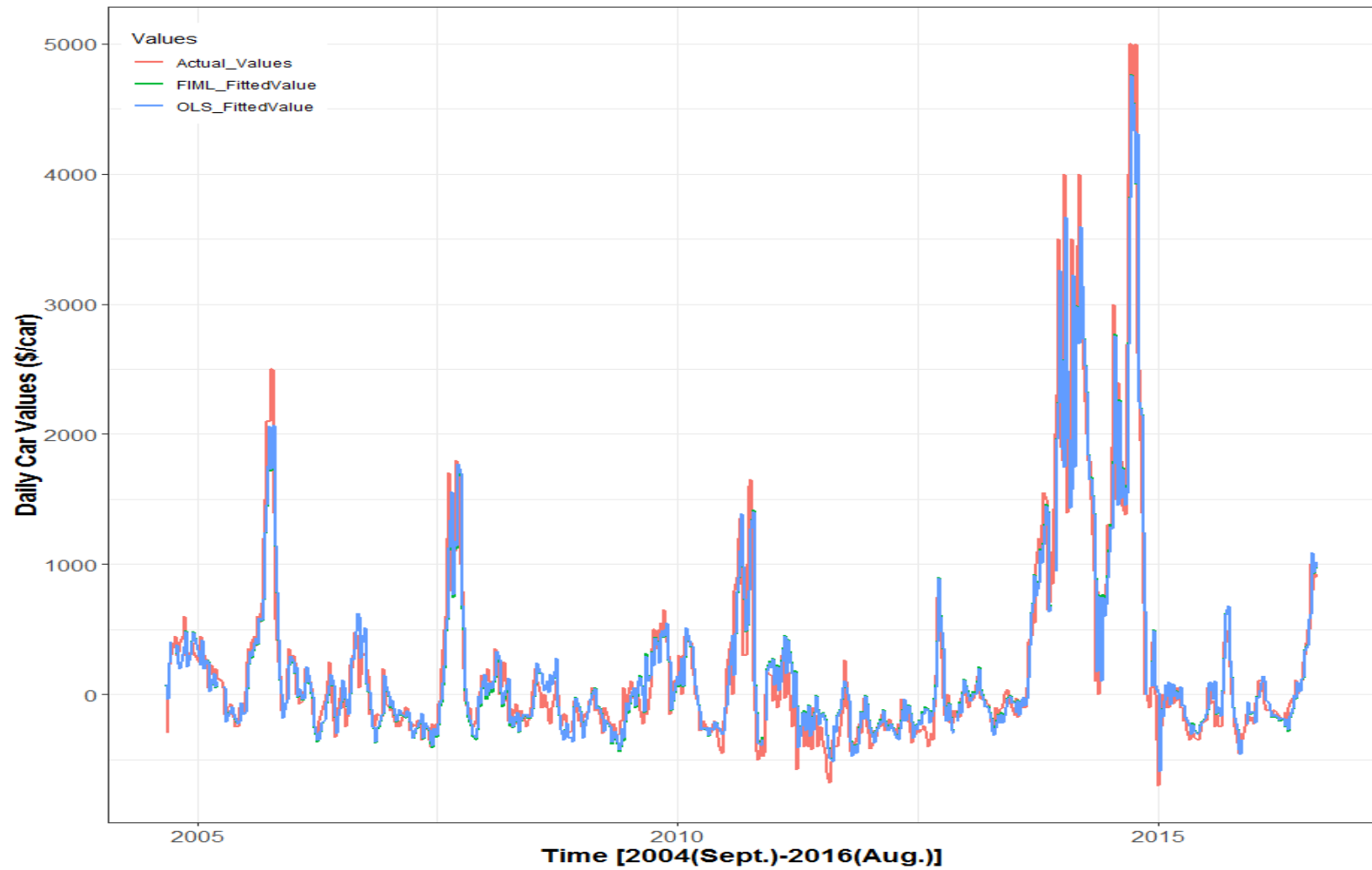
- Test for Simultaneity.
  - Test as to whether PNW Basis and DCV are simultaneous.
- OLS, Full Information Maximum Likelihood (FIML) Estimation.



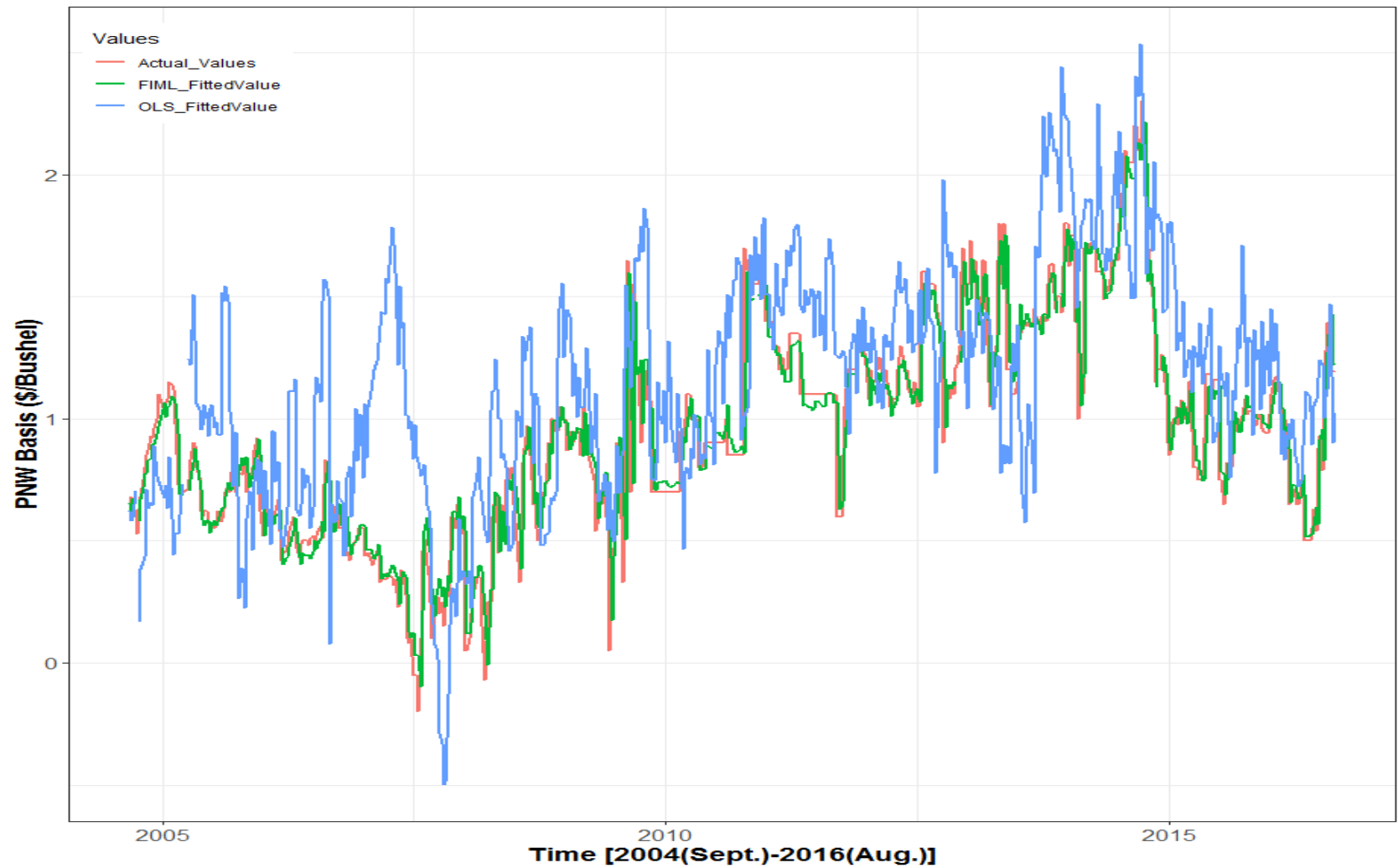
# Results: *Study 1*

- Basis and 2<sup>nd</sup> market values *are determined simultaneously*
- Most important variables impacting 2<sup>nd</sup> market
  - Basis
  - Seasonal dummies
  - Ships due in port
  - Intermonth futures spreads
- Most important values impacting basis
  - 2<sup>nd</sup> market values
  - Seasonal months
  - Farmer deliveries (marketing)
  - Intermonth futures spreads

# 2<sup>nd</sup> Market—Predicted vs Actual Values



# PNW Basis—Predicted Vs Actual Values





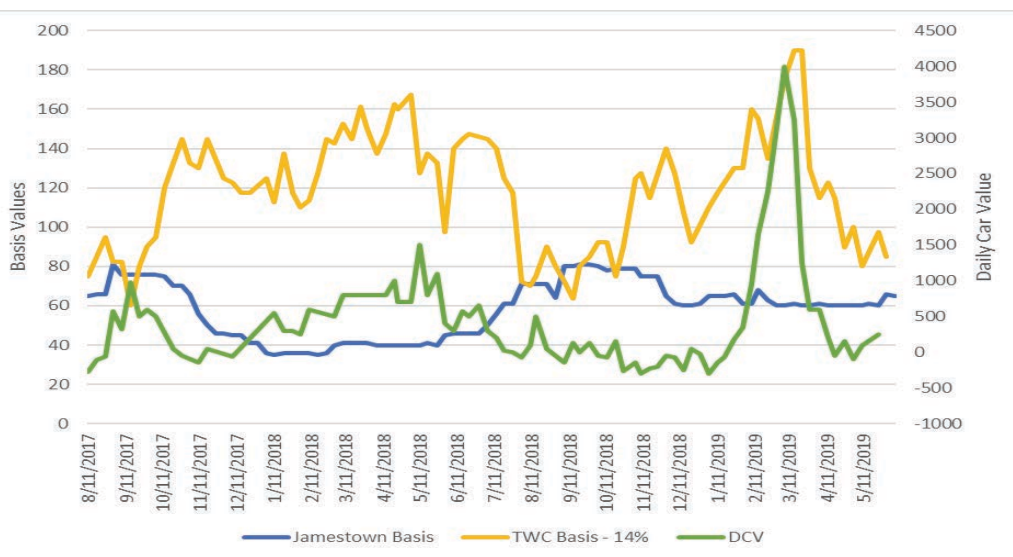
## Study 2: Replication Wilson and Dahl 2011

- Update data
  - Origins: large number of origin basis
  - Pooled/panel data with fixed effects (origin and seasonal)
  - Destinations; PNW and USG
  - Soybean
- Models
  - Single equations assuming  $B_o = f(B_d, X)$
  - Simultaneous determination of B at origin and destination:
    - $B_o^* = f(B_d^*, X)$
    - $B_d^* = f(B_o^*, X)$

# Results: *Study 2*

- **Simultaneous:** origin and destination *basis are determined simultaneously*
  - Treating  $B_o$  and  $B_d$  as dependent is inappropriate and estimates inaccurate
- **Critical relations**
  - $\Delta B_o / \Delta \text{Rail} = -.19$
  - $\Delta B_d / \Delta \text{Rail} = .85$
  - *On average (over period) a 1.00 unit change in rail costs results in*
    - $-.19$  in the basis at origins
    - $+.85$  in basis at destination
  - Values change depending on export demand
  - $\Delta \text{Rail}$  costs is shared by producers, and buyers in these proportions
    - Similar to the incidence of a tax (or import tariff)
  - *Late rail car placements* impacts both the destination (positive) and origin (negative) basis; but, a greater impacted on the destination basis

## Observation: *2<sup>nd</sup> Values and HRS Basis at Jamestown and Minneapolis*



- Terminal market basis is positively correlated with 2<sup>nd</sup> market value
- Origin basis is less correlated with 2<sup>nd</sup> market value
- Similar to PNW soybean

# Study 3: Factors Influencing the Gulf and PNW Soybean Export Basis

David W. Bullock, Ph.D.  
William W. Wilson, Ph.D.

*Keynote at NC134 Regional Research on Risk Mgmt.*

<sup>1</sup>Research Associate Professor, and University Distinguished Professor and CHS Endowed Chair in Risk and Trading, Department of Agribusiness and Applied Economics.



# Purpose and Method

- **Purpose:** examine the impact of supply/demand and logistical variables on both the average level and seasonality of U.S. export basis for soybeans
- **Specific:**
  - Determine factors impacting the *inter-year* basis at USG and PNW for soybean
  - Identify *analogue years* for soybean basis
  - Determine factors impacting the characterization of the analogue year behavior





## Seasonal Analog Analysis

- Most studies either explicitly or implicitly assume that seasonality is constant from year-to-year:
- Many commodity markets exhibit varying seasonal patterns which are driven by market factors
- Seasonal patterns are often grouped into what are commonly called *seasonal analogs*. (e.g., ***short crops have long tails, etc.***)
- Little academic research into the seasonal analog methodology.

# Summary of Results

- Marketing year basis level for Gulf and PNW are Primarily influenced by competitive pressures – both international and domestic.
  - *Brazil export basis is critical : positive*
  - *Chinese exports are important with a greater impact on the PNW*
- **No single dominant seasonal pattern for either Gulf or PNW basis –**
  - Seasonal characterization varies substantially from year-to-year and is not correlated between the two markets.
  - 5 and 4 analogues
- **Seasonality of the basis is primarily influenced by**
  - export activity at each location
  - logistical factors (rail cars late and DCV)
  - pace of farmer deliveries into the market,
  - transportation costs – primarily barge and ocean freight.



# STUDIES: RAIL MECHANISMS ON SHIPPER STRATEGIES

*How shipper strategies change when confronting 2<sup>nd</sup> car market and related risks*

- ❖ Car Guarantees as Real Options
- ❖ Optimal grain Purchasing Strategy under Market and Logistics risk

# Study 4: Car Guarantees as Real Options

Daniel J. Landman, M.S.  
Wilson W. Wilson, Ph.D.

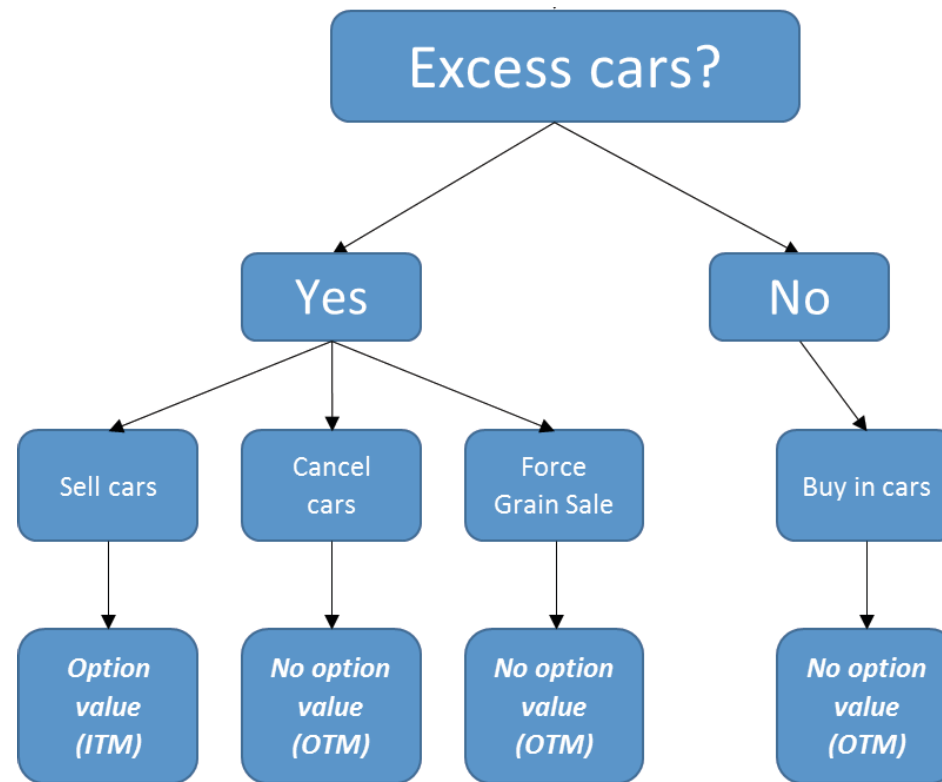
*Research Report under review*



# Transferability of Contracts

- A very important feature of rail mechanisms is transferability of the instrument (not all RR's allow transferability)
  - Facilitates 2<sup>nd</sup> market and transparency
  - An element of risk management
- Grain shippers can buy or sell any short or extra cars in a secondary market
- Transferability has value, i.e., real option value due to the option to transfer
- Similar to call or put option
  - This study focuses on the selling of railcars, i.e. put option
- How much is this option worth?

# Payoff Diagram at Each End Node:





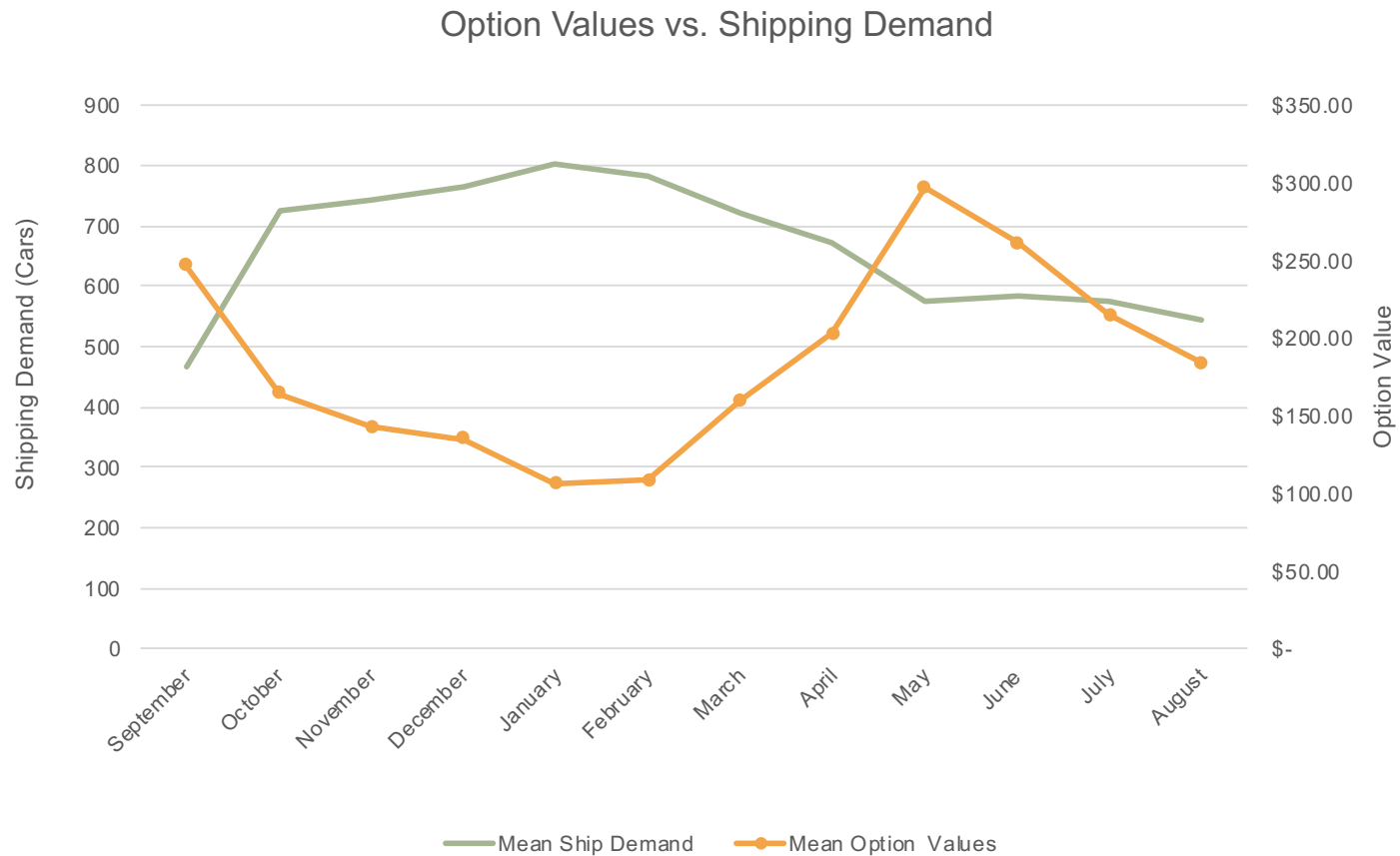


# Model

- Prototypical shipper
- Numerous sources of risk e.g.,
  - Changes in
    - Basis
    - 2<sup>nd</sup> market values
  - Velocity
  - Farmer deliveries (sales)
  - etc.
- Monte Carlo simulation and optimization
  - Max profits

# Option Values & Shipping Demand

Average option value (over study period): \$185/car



## Sensitivity – Shipping *Demand Volatility*

Month/ Volatility	25%	50%	77% (Base)	100%	125%
September	\$246	\$246	\$246	\$257	\$266
October	\$142	\$144	\$164	\$172	\$196
November	\$111	\$117	\$143	\$158	\$186
December	\$88	\$98	\$134	\$154	\$190
January	\$53	\$66	\$106	\$131	\$170
February	\$57	\$72	\$108	\$138	\$179
March	\$104	\$124	\$159	\$196	\$236
April	\$149	\$168	\$203	\$235	\$273
May	\$240	\$261	\$297	\$324	\$358
June	\$197	\$218	\$261	\$281	\$314
July	\$152	\$170	\$215	\$229	\$260
August	\$112	\$133	\$184	\$195	\$227
<b>Average</b>	<b>\$138</b>	<b>\$151</b>	<b>\$185</b>	<b>\$206</b>	<b>\$238</b>

- Increase in volatility in shipping demand
  - E.g., uncertainty of farmer deliveries
- Option value increases
- **KEY:** *Risk in shipping demand (farmer selling) is critical!*





# Summary

- **Grain shipping is risky for shippers**
  - Quantity, price, and rail performance are all variable
  - Shipping costs often get reflected in basis values to farmers and buyers
- **Shipping mechanisms allow for excess cars to be sold, or transferred, into a secondary market**
  - Additional flexibility adds value to the contract
- **Results**
  - Option value: \$185/car,
  - Impacted by
    - shipping demand level, and volatility (risk)
    - secondary market prices,
    - velocity

## Analogy: Importance

- **Long or short grain:** *Short Freight*
- Mechanisms can be used to reduce risk in freight
- Shippers have to be strategic and proactive on numerous factors to mitigate risks

## Study Results

- Contracts with transferability provide substantial value
- When shuttle contract costs less than option value, surplus value is gained by the shipper
- *Transfer option value is volatile and depends on*
  - secondary market prices
  - shipping demand levels & volatility

# Implications for Shippers

# **Study 5: Optimal Grain Purchasing Strategy Under Market and Logistics Risk**

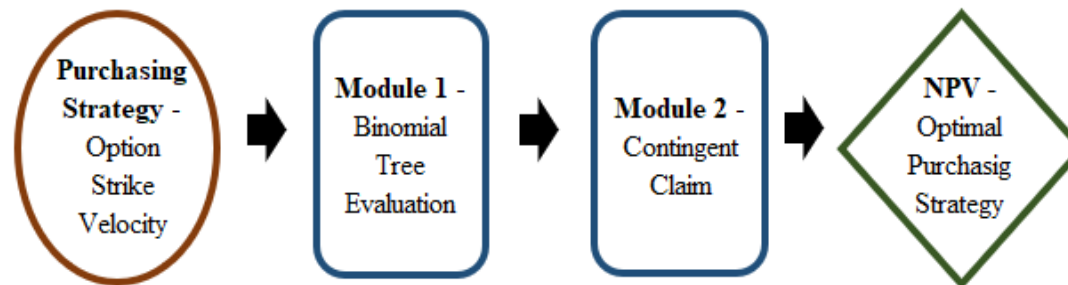
William W. Wilson, Ph.D.

Jesse D. Klebe



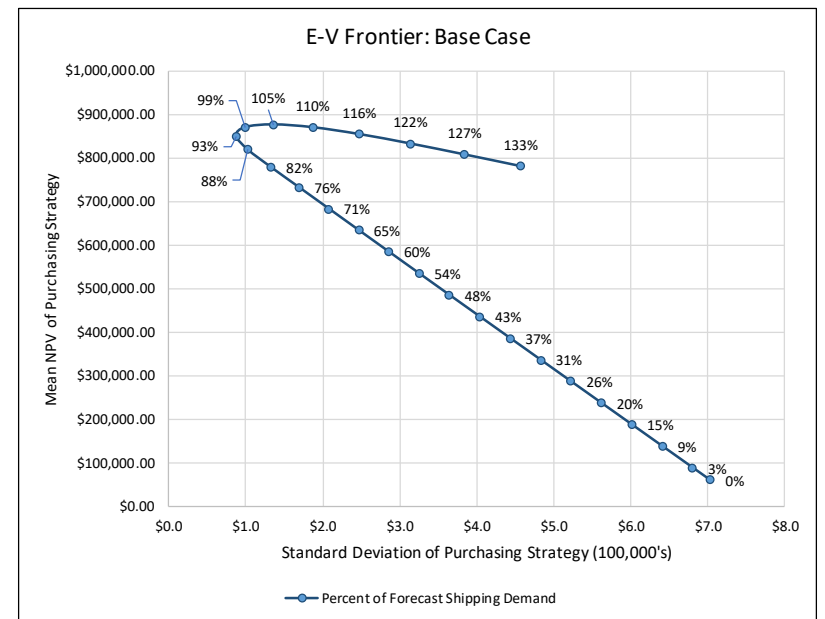
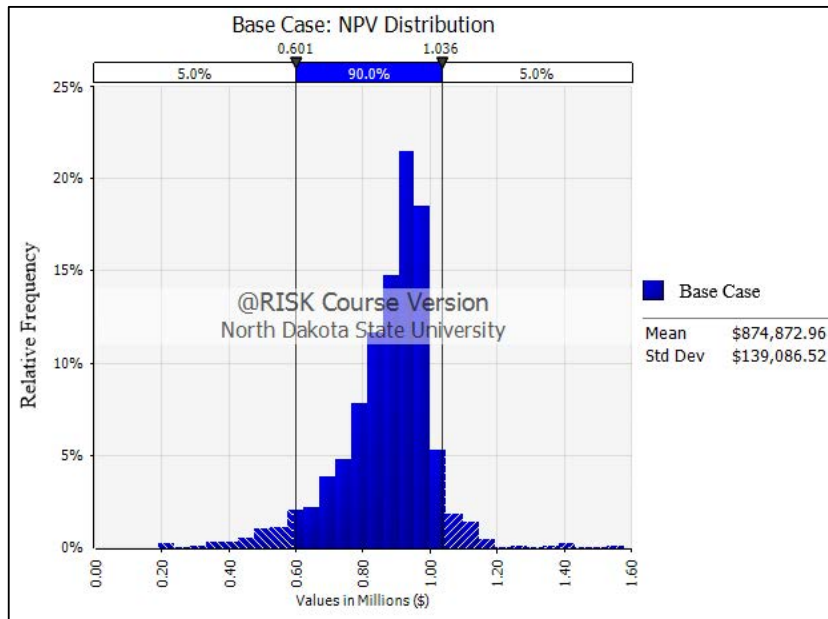
## Shippers Accumulate Inventories in Anticipation of Car Supply which has Uncertainty

- Shippers buy rail instruments which have an uncertain supply of shuttle trains due to velocity volatility
- Shippers build inventories in grain in anticipation of cars placed.
  - Overestimating car supply results in excess inventory being rolled over to the next shipping period and earn return to storage or loss
  - Shippers may sell excess shuttle trains into the secondary rail market at a premium or discount.
- Excess inventories can be viewed as an option on future sales.
  - Inventory results in a call spread dependent on supply/demand. The call spread is interpreted as a real option.
- Interpret: Inventories (purchases + stocks) are a strategic variable and has value, i.e., a real option value
- Methodology is applied to shipper shipping soybeans to the PNW. Real option methodology values car supply with velocity of shuttle trains as the underlying state variable.
  - Model consists of two module components which utilize stochastic simulation and optimization to achieve an optimal inventory strategy based on maximum expected profit (NPV).



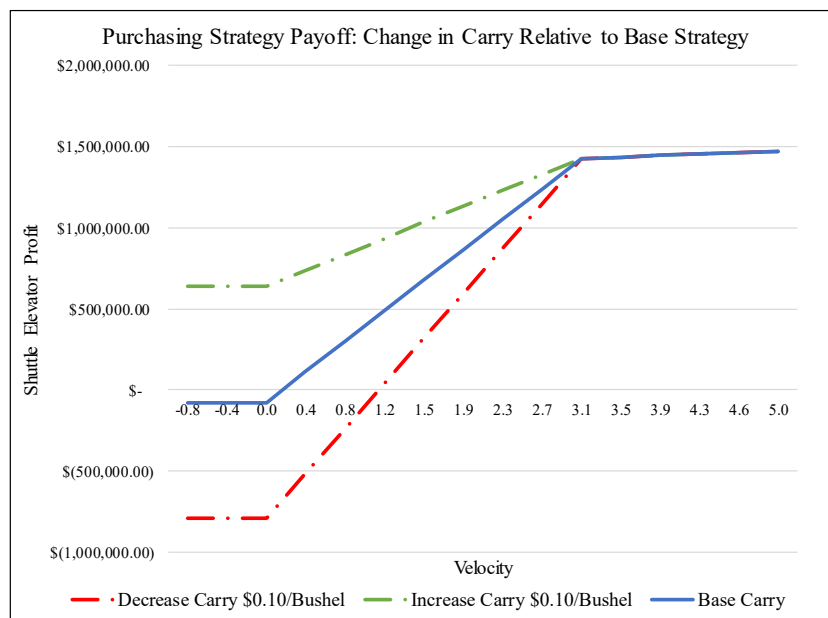
# Base Case Results: Continued

- *Maximum NPV occurs with inventories at 105% of forecast car supply;*
- Distribution of NPV is negatively skewed.; meaning, small chance of larger loss (asymmetric profits)
- Results from short call premium having a value of  $\max(0, X-K)$ .



# Sensitivity: *Market Carry*

- Sensitive on Market Carry shifts the mean of the distribution +/- \$0.10 per bushel.
- Changing Market Carry affects the value of unshipped bushels.
- Increase in Market carry increases the incentive to store (i.e., bigger inventories). The result is to max out inventory and purchase 135% of forecast velocity.
  - Shipper gains money if bushels are shipped or stored.
  - If not shipped, cars are sold and profits still accrues
- Decrease in Market carry decrease the incentive to store. Purchase fewer bushels, 98% of forecast car supply, to avoid storing bushels for a loss of profit.

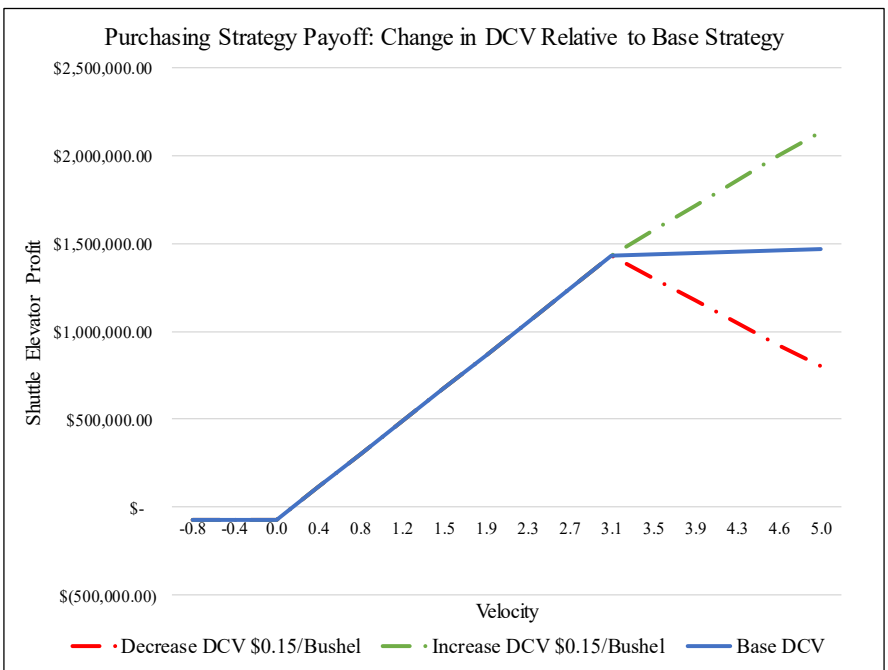


Observation	Decrease Carry \$0.10	Base Carry	Increase Carry \$0.10
Gross Market Carry	\$0.14	\$0.24	\$0.34
Storage and Interest	\$0.26	\$0.26	\$0.26
Returns to Storage	-\$0.12	-\$0.02	\$0.08
Purchasing Strategy	6,670,000	7,150,000	9,240,000
Trains Prepared for Based on Purchasing Strategy	17	19	24
Percent of Forecast	98%	105%	135%
NPV	\$844,808	\$874,873	\$994,757
Standard Deviation	\$111,397	\$139,087	\$494,313
Short Strike Velocity	2.89	3.10	4.00
Number Short Call	694,854	463,854	232,854
Short Call Premium	0.184	0.091	0.001
Number Long Calls	718,218	487,218	256,218



# Sensitivity: *Daily Car Value*

- Shuttle car Premium: *Optimal purchasing strategy is to sell trains into the secondary market. (Highly Risky)*
- Shuttle car discount: *Optimal purchasing strategy is to purchase 110% of forecast demand.*



Observation	Decrease DCV \$0.15/Bu	Base DCV	Increase DCV \$0.15/Bu
DCV \$/Bu	-\$0.14	\$0.01	\$0.16
DCV \$/Car	-\$494	\$31	\$556
Purchasing Strategy	7,540,000	7,150,000	0
Trains Prepared for Based on Purchasing Strategy	20	19	0
Percent of Forecast	110%	105%	0%
NPV	\$848,940	\$874,873	\$1,094,446
Standard Deviation	\$188,820	\$139,087	\$813,682
Short Strike Velocity	\$3	\$3	\$0
Number Short Call	810,354	463,854	117,354
Short Call Premium	0.046	0.091	2.958
Number Long Calls	487,218	487,218	487,218



# Implications

- Shippers have many uncertainties (risks)
  - changes in secondary rail car values,
  - Velocity
  - Market (F, B, DCV) spread.
- Rail mechanisms can be used strategically to mitigate some of these risks
- Shippers should adjust inventories (buffer stock of inventories) relative to forecast car supply to avoid forgone profit from stockout.
- Transferability of the primary rail instrument greatly impacts the payoff function of expected profits and the optimal purchasing strategy

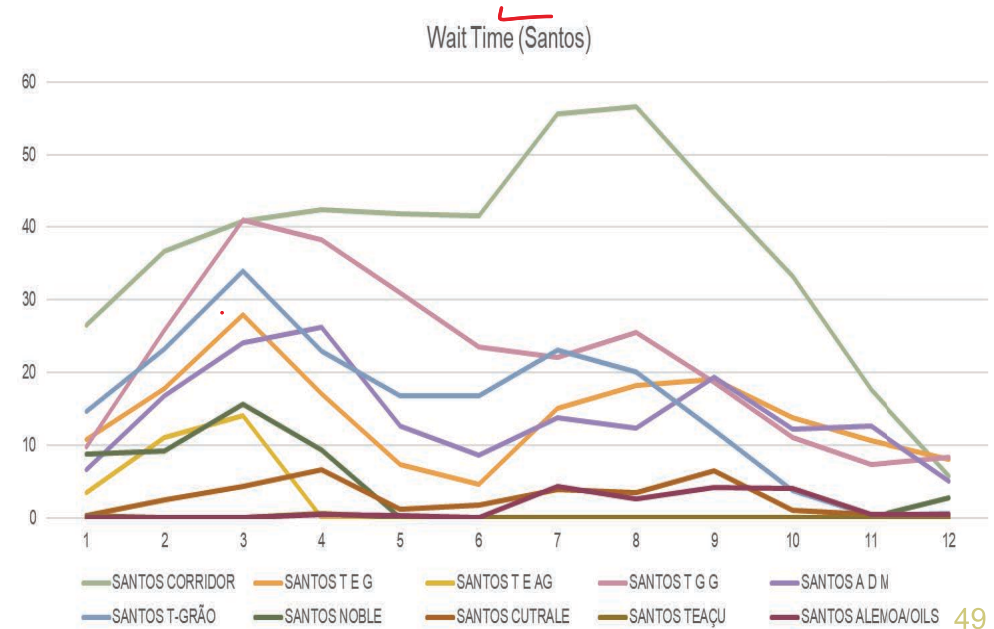
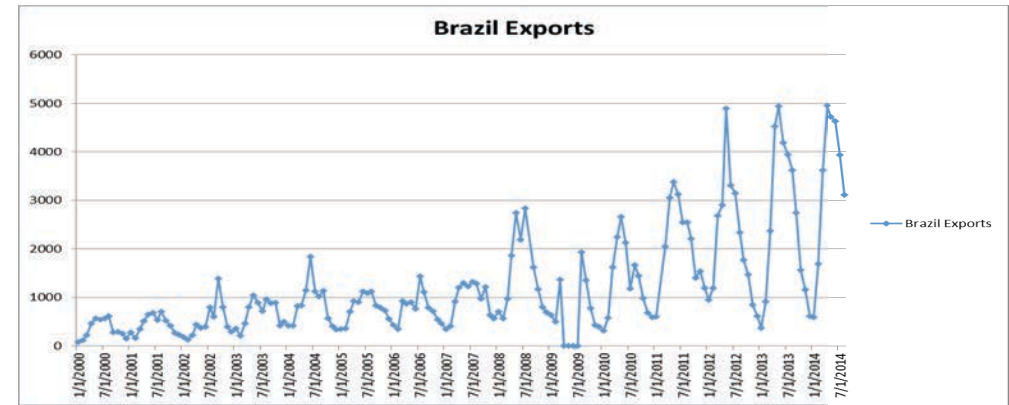


# 2019 Developments: *Impacts or Trump/China*

-

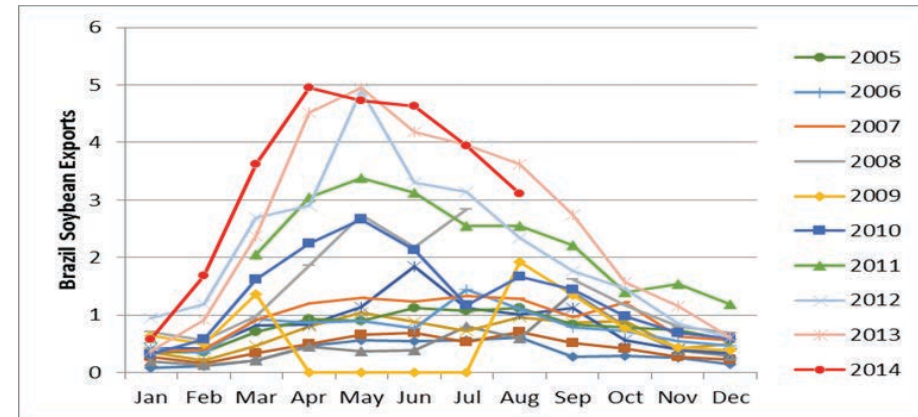
# Brazil Logistical Performance

- Capacity has been expanding
- Crop harvested quickly and has not experienced logistical problems like previous years.
- Wait times are large; but, improving
- **Impact:** Reduced demand for US exports, some cancellations, and improved basis values

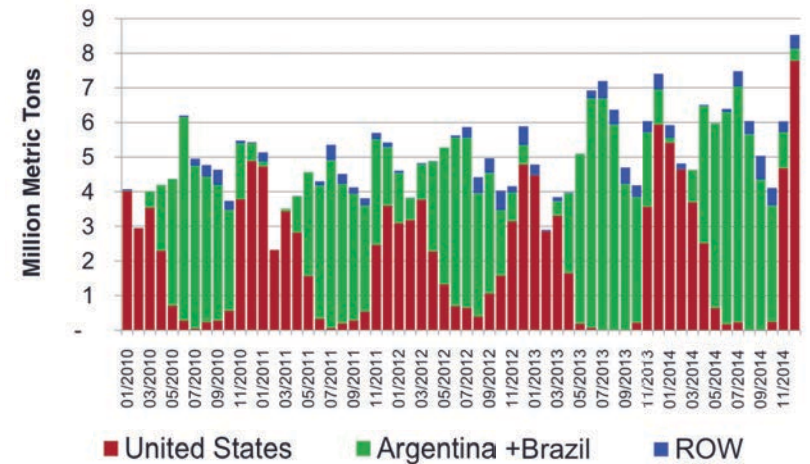


# Soybean: Seasonal exports

- Bifurcated supplies due to
  - Seasonal production and marketing in Brazil and US
- **Impact:** US and Brazil supply during harvest and post-harvest period. Traditionally,
  - Brazil: traditionally March-July
  - US: September-Jan/Feb
- As Brazil expands production or logistics, it penetrates periods in which US normally dominates

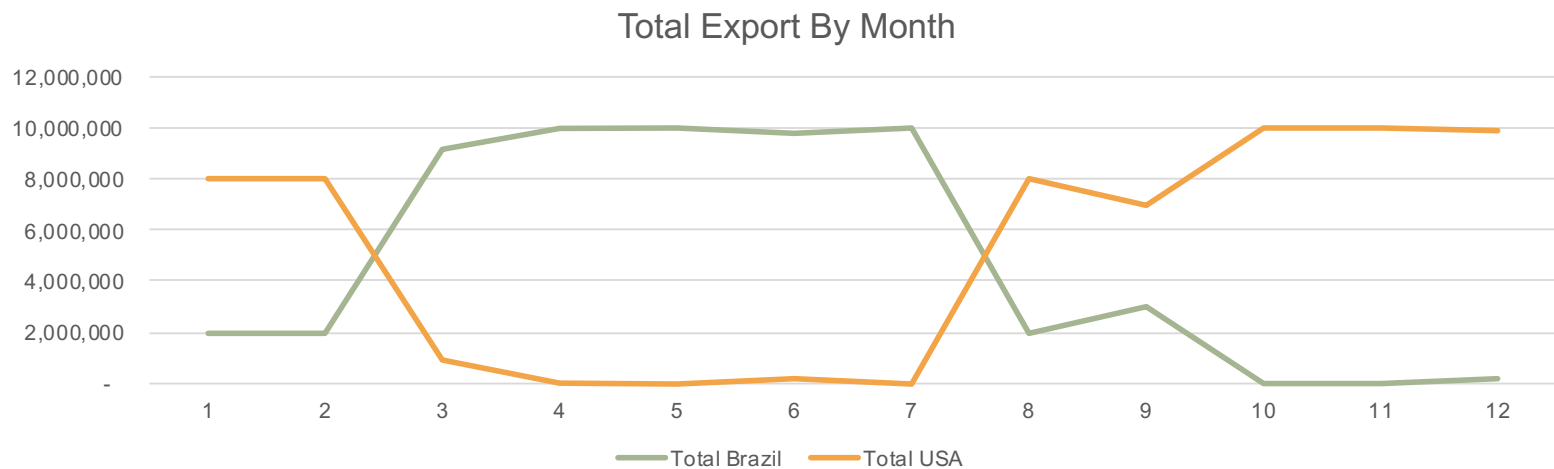


Monthly Chinese soybean imports



Source: Global Trade Information Services (GTIS)

## Wilson: *Stochastic Simulation of US-Brazil Logistics Competition in China*



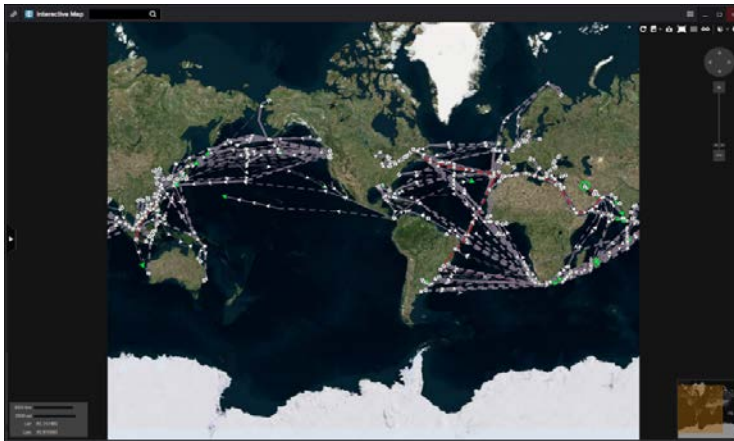
- Costs include:
  - Origin interior country basis
  - Interior shipping costs (rail, 2<sup>nd</sup> market, barge, etc.)
  - Waiting time costs (Bzl)
  - Ocean shipping to China



# Soybean Flows

## 12-13-2016 and 4-23-2019

Source: Thomson Reuters

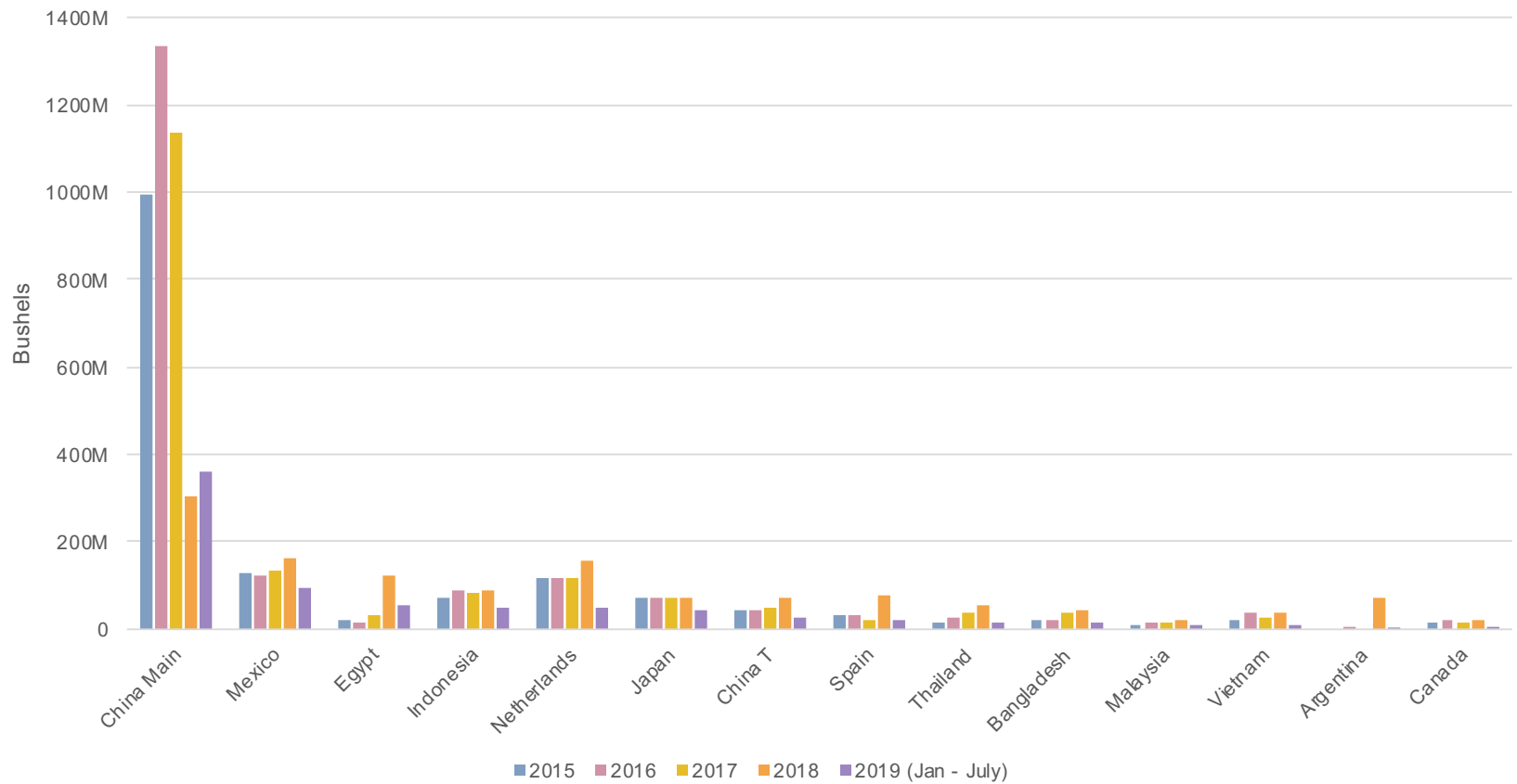


- Ships in transit carrying soybean, Dec 13, 2016
- Dominant origins include:
  - US Gulf
  - US PNW
  - Brazilian/Arg. Ports
  - Ukraine
- Many destinations
- Flows from N. America to Asia include from PNW, US Gulf through the Panama Canal, and US Gulf around the Cape of Good Hope



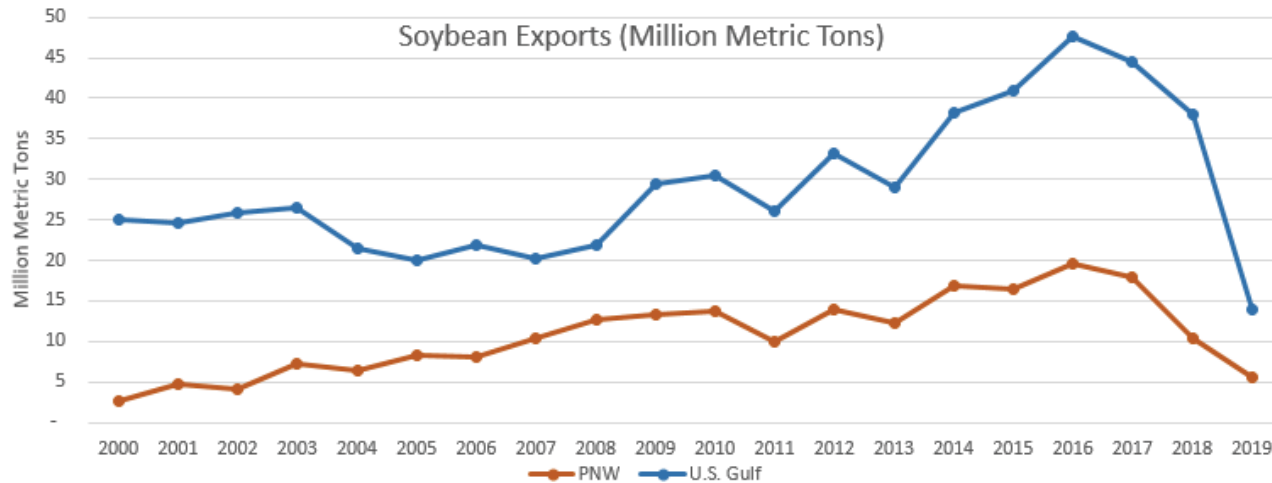
# US Soybean Exports by Destination

US Soybean Exports by Destination

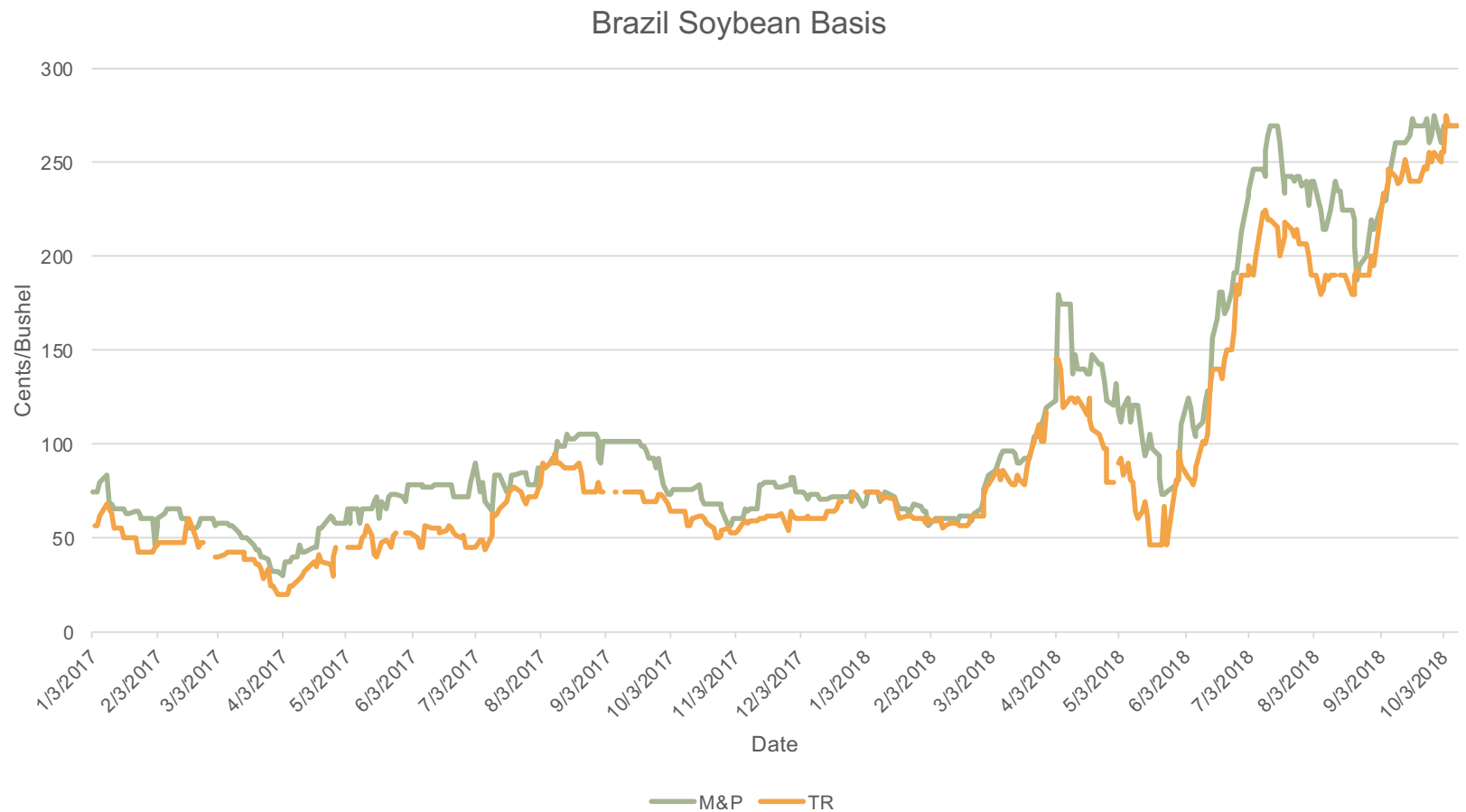


# Soybean Export Amounts at PNW and U.S. Gulf

- There has been substantial growth in US Soybean exports
- These have occurred at both the US Gulf and PNW
- PNW growth rate (in % terms) has been fairly substantial increasing to 20+ mmt/year

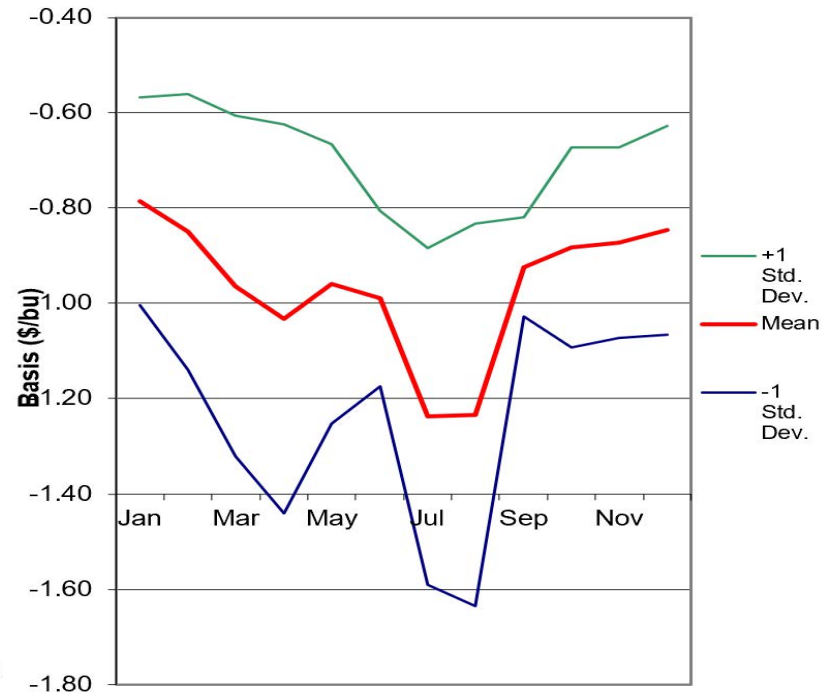
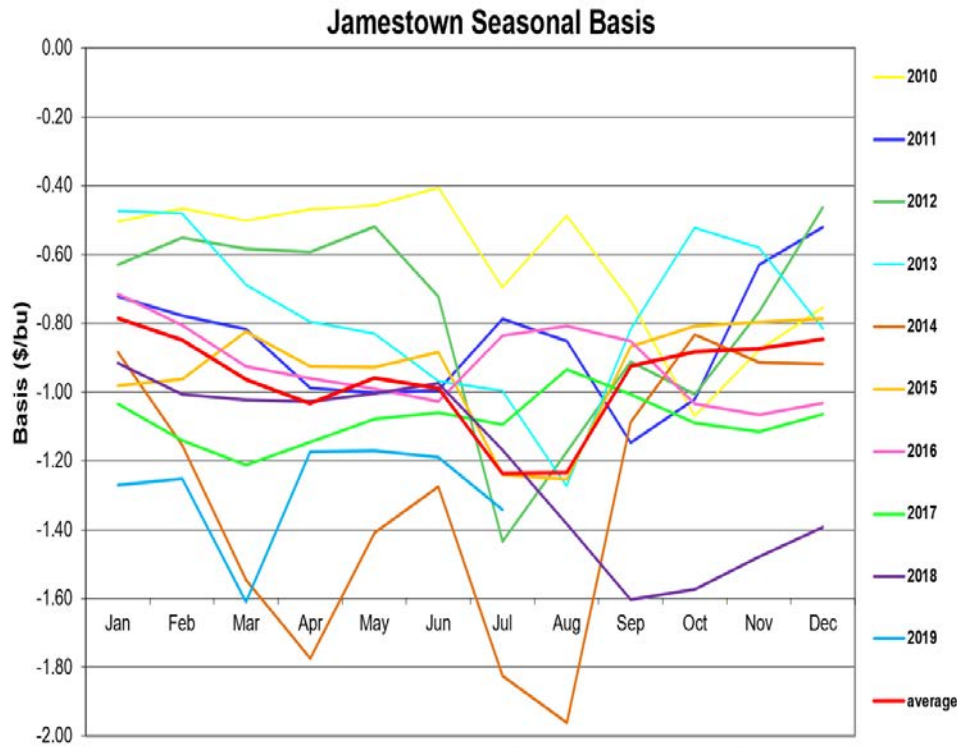


# Brazil Basis Increases from mid-2018



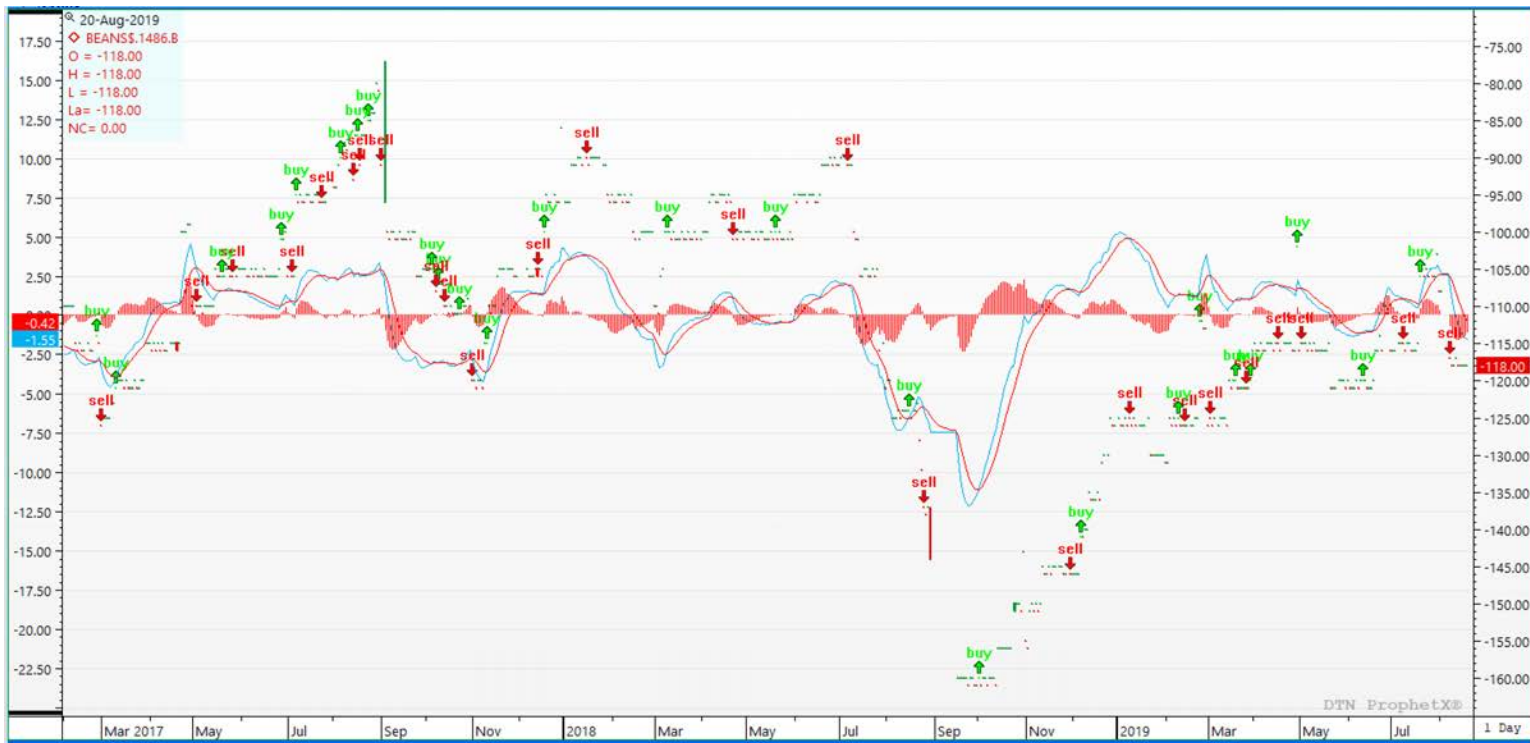
# Jamestown Seasonal Soybean Basis Declines

Current: new crop -160 (65c/b under normal)



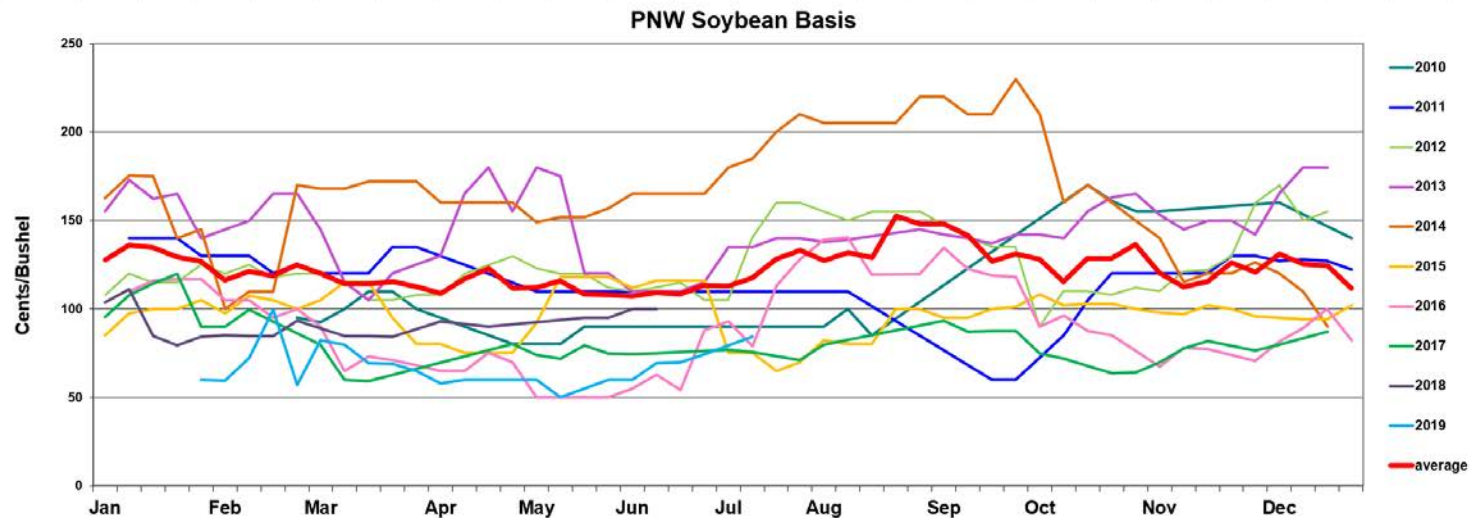
# Jamestown (Gavilon) Basis:

*Normal=-65 Now -161to -125 (+35c)*



# Seasonal PNW Soybean Basis Declines

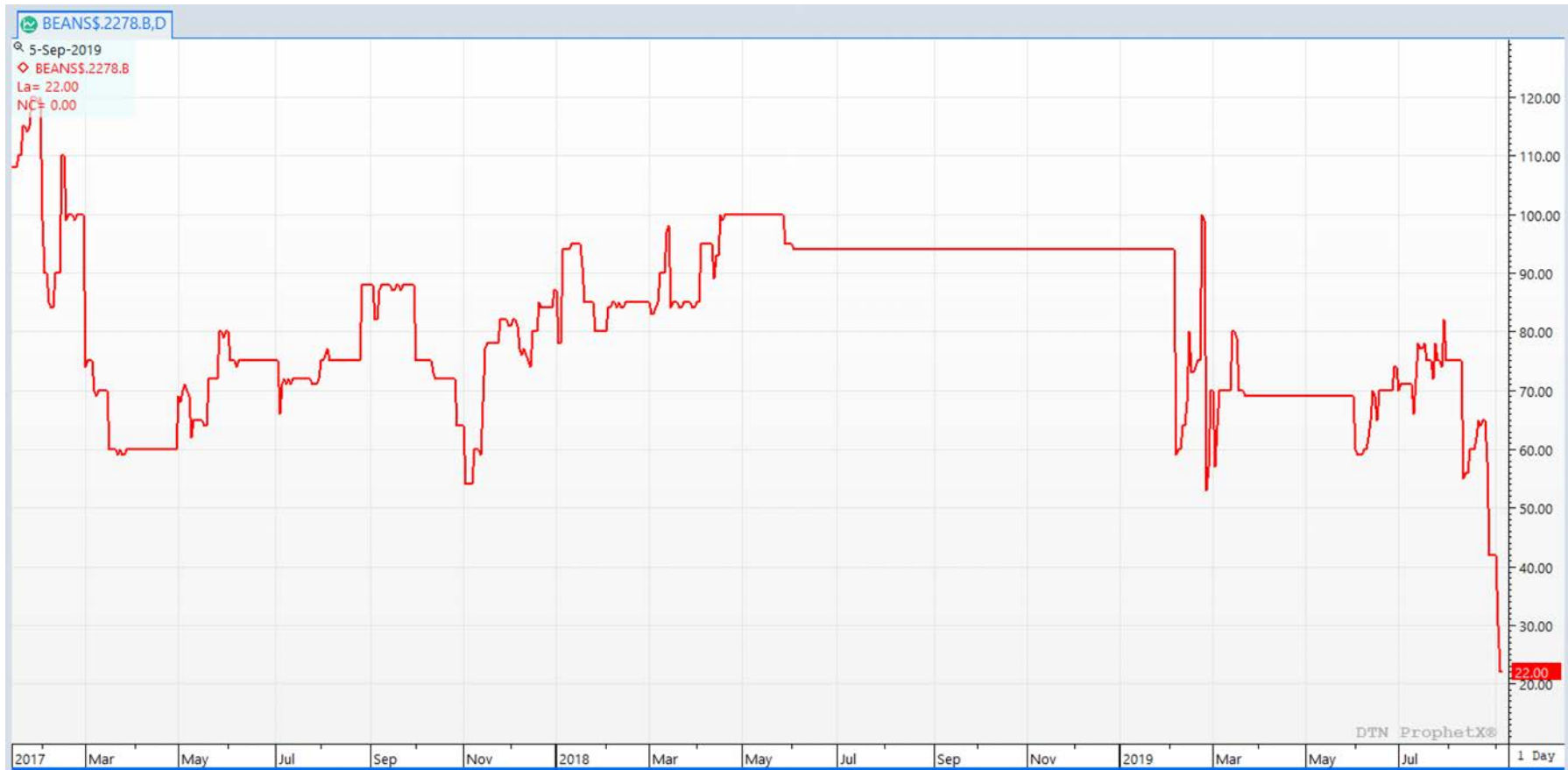
Current: Spot +60 to 70 (or less) vs. (vs average 130); and going to <40 (bids)



- **Most important factors impacting US Export Basis:**
  - Brazil Export Basis
  - China imports
  - Depressed 2<sup>nd</sup> market values
  - Etc.
- Recent study: Bullock and Wilson, *Factors impacting the US Export Soybean Basis* (forthcoming)



# PNW Spot Basis (DTN) Delivered (Bids): *Record low!*





# 2019 Developments: *Impacts or Trump/China*

- **Shifting grain flows away from/from the US**
- **Greater Uncertainty to world and domestic trading**
- **US growers store/defer marketing; Rest of world Sells**
- **Growth in investment/organization of grain logistics and marketing elsewhere in the world**
  - Export capacity expansion in Brazil
  - Canada; high-throughput, more elevators interior and export
  - Shuttles in Ukraine and Russia
  - Dredging (China?) of the Paraná River
  - Panama Canal expansion

Information: Price transparency

- **Information:**  
Transparency Provide Signals
- *Signals to Shippers*
  - When to ship
  - Ship vs Storage
- *Signals to RR's*
  - Temporally demands

Allocation Mechanisms

- **Allocating among shippers,**
  - Cars for spot shipments,
  - Capacity for deferred shipments.
- **Other mechanisms for allocation**
  - historical averages,
  - time of request (first-order-first-served),
  - contracts,
  - random allocation,

Each of these in one way or another have been used in rail grain.
- **Auction based systems** are more efficient in terms of assuring cars are allocated to shippers with the greatest value. |

## Summary: Overview— Major functions of rail car markets

# Impacts of Rail on Basis

- **Basis and 2<sup>nd</sup> market values and basis are**
  - Loosely correlated
  - Simultaneously determined
  - Velocity is one of most critical variables
  - Origin and destination basis are determined simultaneously
  - **Changes in shipping costs**
    - Positive impact on destination basis
    - Negative impact on origin basis
    - Greater positive impact on destination basis
    - Late rail cars impact basis similarly
- **Most important variable impacting export basis**
  - Brazil basis values
  - China imports



## Results

- Shipping and basis markets are now integrated and simultaneously determined in a complicated way.
  - origin and destination basis are determined simultaneously,
  - Export basis is impacted by most important are the export basis in Brazil, and the level of imports by China, in addition to many other factor
- Changes in shipping costs, and late rail car placements, impact both the origin and destination basis
  - Both adversely impact the basis, but there is a greater impact on terminal markets and therefore buyers, than at the origin (at least on average).

## Overall implication for shippers

- Shipping and logistics strategies should be integrated and managed accordingly.
- Shippers that are *short or long grain*, are simultaneously *short freight*.
- Shippers should coordinate their rail position with buying and selling
  - lower risks and higher profits.

# Implications for Shippers and Markets

## Rail mechanisms have 'real option' value

- Primary contract has a feature which is the option to transfer the contract.
- **Results:**
  - Base case (based on average values in our sample) the option value of a primary contract is \$185/car.
  - Since primary shuttle contracts typically are between \$50 and \$150, this transferability provides value to the shipper.
  - Shippers typically under-value the transferability embedded within these shuttle contracts.
  - Factors that impact this value include
    - seasonal variability,
    - rail car velocity,
    - secondary market values,
    - Volatility in shipping demand a
    - Spreads in the futures and basis market.

## Car ordering/grain Inventory Strategy

- Shippers have to develop a purchasing strategy which would maximize their expected profit.
- **Results**
  - It is optimal to have an inventory in excess of forecast car supply (i.e., buffer stock of grain)
  - Base case: Shipper should have an inventory of 5% more bushels than forecast velocity to account for the volatility in car supply and other random variables.
  - Important variable impacting this strategy are:
    - market carry,
    - daily car values,
    - velocity volatility

# Impacts of rail mechanisms on shipping strategies



## Strategy

- **Transferability transparency.**
  - Railroads have taken varying approaches to these; and they have changed over time.
  - Transferability has value to shippers and impacts shipper decisions
  - Market is better served by having transferable instruments and transparent price (or price discovery).
- **Velocity has numerous impacts**
  - Velocity impacts the value of the transfer option.
  - Reducing the volatility of velocity is one of the more important metrics for which carriers can strive

## Analysis of mechanism design

- **Determine:**
  - Share of capacity devoted to each mechanism
  - Number and composition of segments
  - Fleet sizing decisions
- **Compare the efficiency** and effectiveness of alternative allocation mechanisms (auctions versus contracts, etc.).
- **Compare the design of the auction mechanism.**
  - There are many auction types and design decisions for each and a comparison of the features may be useful as these mechanisms are fine-tuned.

# Implications for Carriers

# Open Data

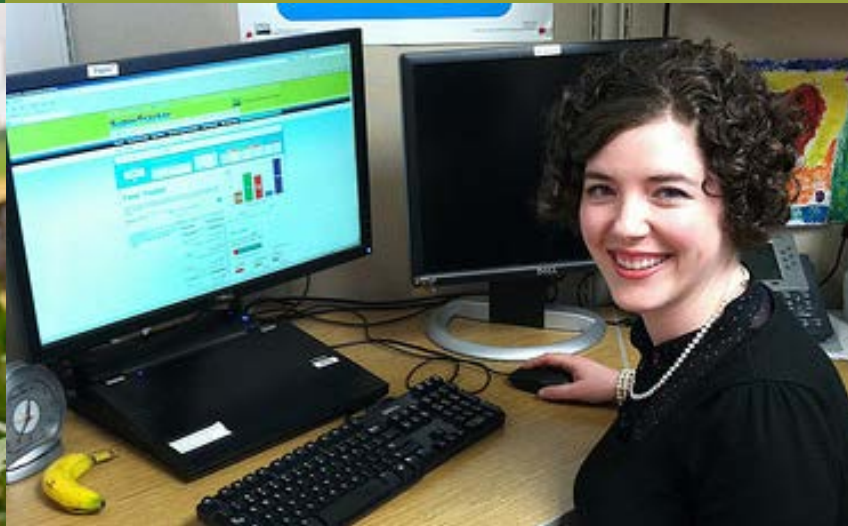
in the **Transportation**  
and **Marketing** Program

Agricultural Marketing Service

# SOME OF OUR CUSTOMERS



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Operators



## Our Existing Reports

### Barge Transportation

**Figure 8**  
**Illinois River Barge Freight Rate<sup>1,2</sup>**

<sup>1</sup>Rate = percent of 1976 tariff benchmark index (1976 = 100 percent); <sup>2</sup>4-week moving average of the 3-year average.  
 Source: Transportation & Marketing Program/AMS/USDA

**Table 9**  
**Weekly Barge Freight Rates: Southbound Only**

	Twin Cities	M&D-Mississippi	Lower Illinois River	St. Louis	Cincinnati	Lower Ohio	Chiro-Memphis
Rate <sup>1</sup>							
4-23-2019	-	-	378	278	293	293	275
4-16-2019	-	-	380	283	318	320	275
\$/ton							
4-23-2019	-	-	17.54	11.09	13.74	11.84	8.64
4-16-2019	-	-	17.63	11.29	14.91	12.93	8.64
<b>Current week % change from the same week:</b>							
Last year	-	-	-29	-34	-38	-38	-27
3-year avg. <sup>2</sup>	-	-	3	-4	-4	-5	6
Rate <sup>1</sup>							
May	453	397	385	282	297	297	270
July	440	397	385	282	297	297	270

<sup>1</sup>Rate = percent of 1976 tariff benchmark index (1976 = 100 percent); <sup>2</sup>4-week moving average; ton = 2,000 pounds; "-" is due to closure  
 Source: Transportation & Marketing Program/AMS/USDA

**Figure 9**  
**Benchmark tariff rates**

Calculating barge rate per ton:  
 (Rate \* 1976 tariff benchmark rate per ton)/100

Select applicable index from market quotes included in tables on this page. The 1976 benchmark rates per ton are provided in map.

Grain Transportation Report 11 April 25, 2019

Static, not interactive

## Downloading Our Data

USDA United States Department of Agriculture  
 Agricultural Marketing Service

Market News | Rules & Regulations | Grades & Standards | Services | Resources | Selling Food to USDA

Home > Services stay connected: [Social Media Icons]

**Transportation Research & Analysis**

- Overview
- Grain Transportation
- Containers, Ports and Non-Grain Agricultural Products
- International Transportation Analysis
- Agricultural Transportation Research and Information Center
- Regulatory Representation
- Cooperative Research Summaries
- Data
- Contacts
- Reports
- Grain Transportation Report
- Ocean Shipping Container Availability Report
- Agricultural Refrigerated Truck Quarterly
- Transportation Updates and Regulatory News
- A Reliable Waterway System Is Important to Agriculture
- Brazil Soybean Transportation
- Soybean Transportation Guide: Brazil
- Mexico Transport Cost Indicator Reports

**Grain Transportation Report Datasets**

The links below contain the data used to create the tables and figures found in the USDA's Grain Transportation Report. These data series are aggregated from non-confidential and non-copyrighted sources. Below you will find the title of the table or figure. The line below the title gives a brief description for each of the files, followed by the source. These documents are in .xlsx format unless otherwise noted. If you have any questions about any of the files please contact us at: [GTRContactUs@ams.usda.gov](mailto:GTRContactUs@ams.usda.gov).

- Table 1: Grain Transport Cost Indicators - Weekly changes in truck, rail, barge, and ocean freight rates using diesel prices, nearby secondary rail market rates, Illinois barge rates, and ocean freight rates from U.S. Gulf and PNW to Japan as proxies. (.xlsx file)**  
 Source: Transportation & Marketing Program/AMS/USDA
- Table 2: Market Update: U.S. Origins to Export Position Price Spreads (\$/bushel) - Compares interior prices of corn in Illinois and Nebraska and Gulf, Iowa and Gulf soybean prices, Kansas and Gulf Hard Red Winter wheat, North Dakota and Portland Hard Red Spring wheat. (.xlsx file)**  
 Source: Transportation & Marketing Program/AMS/USDA
- Table 3: Rail Deliveries to Port - Weekly rail deliveries to port for the PNW, Texas Gulf, Mississippi River, and Cross-Border Mexico movements. (.xlsx file)**  
 Source: Transportation & Marketing Program/AMS/USDA
- Table 5: Railcar Auction Offerings - Weekly railcar bids/offers in the primary shuttle and non-shuttle railcar market. (.xlsx file)**  
 Source: Transportation & Marketing Program/AMS/USDA
- Figure 4, 5, 6; Table 6: Bids/Offer for Railcars to be Delivered in the Secondary Market - Weekly railcar bids/offers for the secondary non-shuttle and shuttle railcar Market. (.xlsx file)**  
 Source: Transportation & Marketing Program/AMS/USDA
- Table 7: Tariff Rail Rates for Unit and Shuttle Train Shipments - Monthly tariff rail rates and fuel surcharges for selected U.S. origin and destination pairs. (.xlsx file)**  
 Source: [www.bidsfor.com](http://www.bidsfor.com), [www.usfca.com](http://www.usfca.com), [www.uscc.com](http://www.uscc.com), [www.uspt.com](http://www.uspt.com)

**News & Announcements**

- 01/31 USDA Launches MARS, Delivering Market Data to Agricultural Producers Around the Globe Faster and Easier
- 11/19 USDA Sets Deadline for Proposals for the 2015 Specialty Crop Multi-State Program
- 06/17 USDA To Host 6th Annual Pollinator Festival during June 19 Farmers Market

Hard to find and use

CURRENT  
 CUSTOMER  
 EXPERIENCE

# Open Data

U s a b l e

S h a r a b l e

D i s c o v e r a b l e

A c c e s s i b l e

# CUSTOMER DEMAND

WHITE HOUSE GOALS

USDA GOALS

MRP/AMS

Open Data  
In  
Transportation  
And Marketing

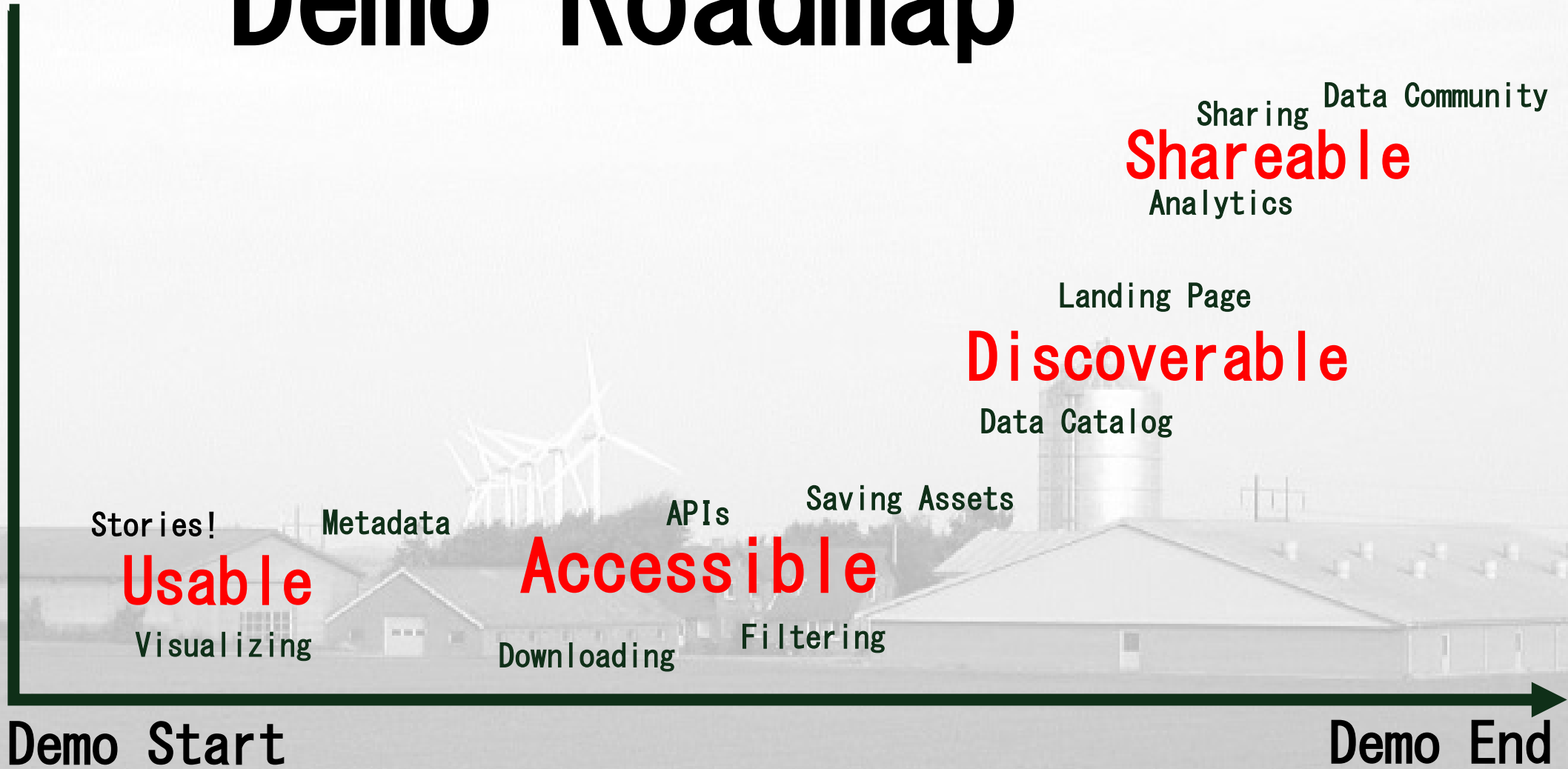


# Demo Roadmap

10000ft

5000ft

Ground Level



# **Private Grain Car Issues**

**National Grain Car Council Meeting**

**September 12, 2019**

Darrell Wallace  
North America Freight Car Association

# Objective

- **North America Freight Car Association background**
- **Two current issues for shippers and private car owners**
  - **“Reciprocity” to facilitate efficient use of private cars**
  - **Changes to AAR Circular OT-5**

# NAFCA

- **NAFCA organized in 1994 to protect the interests of the manufacturers, owners and non-railroad operators of private railcars**
- **NAFCA currently made up of 39 members who collectively own or operate in excess of 754,000 railcars**
  - Railcar manufacturers
  - Railcar owners and lessors
  - Shippers who own and/or lease railcars
  - Associate members
- **NAFCA's goal is to protect the interests of private car manufacturers, owners, lessors and lessees**



# Reciprocity & Efficient Use of Private Cars

- **Around 80% of grain hopper cars are privately owned**
- **Private car investment is in the tens of billions, not including**
  - **Annual maintenance costs**
  - **Storage costs**
  - **Other costs imposed by railroads**
- **Inefficient use of private cars is harmful to:**
  - **Fleet investment**
  - **Shipper business opportunities**
  - **Contract obligations**
  - **Plant operations and fleet management**

# Reciprocity & Efficient Use of Private Cars

- **Demurrage and accessorial charges and practices**
  - **Primarily geared to maximizing efficiency of**
    - **Railroad-owned cars**
    - **Railroad operations**
- **Railroads have insufficient financial incentive to maximize the efficient use of their customers railcars**
- **The STB's recent oversight hearing on Demurrage and Accessorial Charges (Docket No. EP 754)**
  - **Brought to light some of the inequities of the current system**
  - **Highlighted the need for reciprocity to help incentivize railroads to use private cars more efficiently**



# Reciprocity & Efficient Use of Private Cars

- **The STB’s focus on “reciprocity and commercial fairness” in demurrage and accessorial practices is positive and should result in change**
- **NAFCA’s view: achieving true “reciprocity” to protect private car investment and shipper business operations while maximizing the efficient use of the nation’s railcar fleet – not just railroad owned cars – must include:**
  - **Monetary penalties for inefficient use of private cars by railroads (comparable to the charges they assess their customers and third parties)**

# Reciprocity & Efficient Use of Private Cars

- **We commend the STB for its foresight in holding the hearing in EP 754**
  - **Hearing brought the reciprocity issue to the forefront**
  - **Frustrations of shippers were evident by the testimony**
  - **The hearing will not bring about change on its own**
  - **Railroads will not voluntarily make the changes that are necessary**
- **NAFCA urges the STB take formal action to maximize reciprocity as part of its EP 754 proceeding**

# OT-5 and OT-57

- **First OT-5 Circular issued in 1962**
  - Carriers did not have to use private cars if they had cars to provide to the shipper
- **NAFCA predecessor (SCOT-5) complaint with ICC in 1989 produced the current rules**
  - Carriers cannot deny shippers the right to provide private cars for their use except for:
    - Safety issues
    - Mechanical issues
    - Shipper must have adequate storage
  - Carriers cannot deny the use of private cars for “commercial reasons” (everything else)

# OT-5 and OT-57

- **On-line OT-5 application and approval process implemented in 2008**
- **The new on-line process became problematic**
  - **Carriers using OT-5 as a capacity planning tool**
  - **Excessive delays in approval process**
  - **Applications rejected for**
    - **Open maintenance advisories**
    - **Storage plans did not include 100% of cars**
    - **Commodity codes**
    - **Loading locations**

# OT-5 and OT-57

- **Carriers began assessing charges for OT-5 violations**
  - Not listing commodity to be hauled in equipment
  - Not listing all loading locations
  - Not having OT-5 application approval in place for every car
- **NAFCA contacted the AAR and began discussions about resolving OT-5 Issues**
- **Meetings held between the AAR, all Class I carriers and NAFCA members**

# OT-5 and OT-57

- **The joint group determined**
  - **OT-5 application and approval process was not working for either side**
  - **A new system should be developed**
    - **Railroads will no longer approve private cars for loading**
    - **Mechanical data will not be reviewed as part of the registration process**
    - **Commodity information will no longer be required**
    - **Loading point information will no longer be required**
    - **Current contact information for controlling party must be listed**
    - **Current storage information must be listed**
    - **Procedures will be established to move empty cars to storage which have no empty disposition or have been rejected at the destination**
  - **Reference to private car registration and approval in the OT-5 Circular will be eliminated and a new OT-57 Circular will be implemented**



# OT-5 and OT-57

- **NEW OT-57 System**
  - **Implemented in Phases**
    - Phase 1 registration of cars into new system
    - Phase 2 and Phase 3 enhancements to new system
  - **Private railcar controlling parties will be required to submit the following information to Railinc regarding their owned or leased fleets:**
    - Car initial and number
    - Primary contact information (phone and email)
    - Secondary contact information (phone and email)
    - Valid storage location
    - Submissions may be submitted on spreadsheets
  - **Once submitted the cars will be able to operate on all carriers within North America without seeking any approval from any carrier. The only exception will be cars that are found to be mechanically unfit to operate.**

# OT-5 and OT-57

- **Railroads may pursue the option of sending a private car to its storage location if there is not a valid destination (return location) for the car or if a shipper rejects the car under the following timeline:**
  - **FREE DAY** - Notice will be provided to the controlling entity based on the contact information on file.
  - **Day 1 and Day 2** – The controlling entity will have two full business days to respond to the notice for empty billing.
  - **Day 3** – If the controlling entity does not respond to the inquiry, notice will be provided to the car owner who has one full business day to respond to the inquiry.
  - **Day 4** – If the car owner does not respond to the inquiry, the carrier will send a final notice to both the controlling entity and the car owner advising that they have 24 hours to respond.
  - **If no response from the controlling entity or the car owner has been received after the expiration of day 4, the carrier may send the car(s) to the storage location that is on file.**
    - **Note: All times will be calculated from 12:01 am following Day 1 notice.**
    - **Note: Business days only apply to the first 4 days and do not apply to the 5<sup>th</sup> and final day. For example: if the 4<sup>th</sup> day expires at 12:01 am on Saturday then Saturday would be counted as the 5<sup>th</sup> day and action may be taken.**

# OT-5 and OT-57

## OT-57 Movement to Storage Matrix

Day	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
Notice given - free day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
CE response time - Day 1	Tue	Wed	Thu	Fri	Mon	Mon	Mon
CE response time - Day 2	Wed	Thu	Fri	Mon	Tue	Tue	Tue
CO response time - Day 3	Thu	Fri	Mon	Tue	Wed	Wed	Wed
Final Notice - Day 4	Fri	Sat	Tue	Wed	Thu	Thu	Thu
Action may be taken - Day 5	Sat (day 6)	Sun (day 6)	Wed (day 8)	Thu (day 8)	Fri (day 8)	Fri (day 7)	Fri (day 6)

Note: Time is calculated beginning with the first 12:01 am after initial Notice is given.

# OT-5 and OT-57

- **Implementation schedule**
  - **January 2020 will be a transitional period**
    - **OT-57 will be put into production January 1, 2020**
      - **Shippers can begin entering cars into new system**
      - **New car registrations will be entered into new system**
    - **Existing OT-5 system will be turned off February 1, 2020**

**Thank you for your attention**



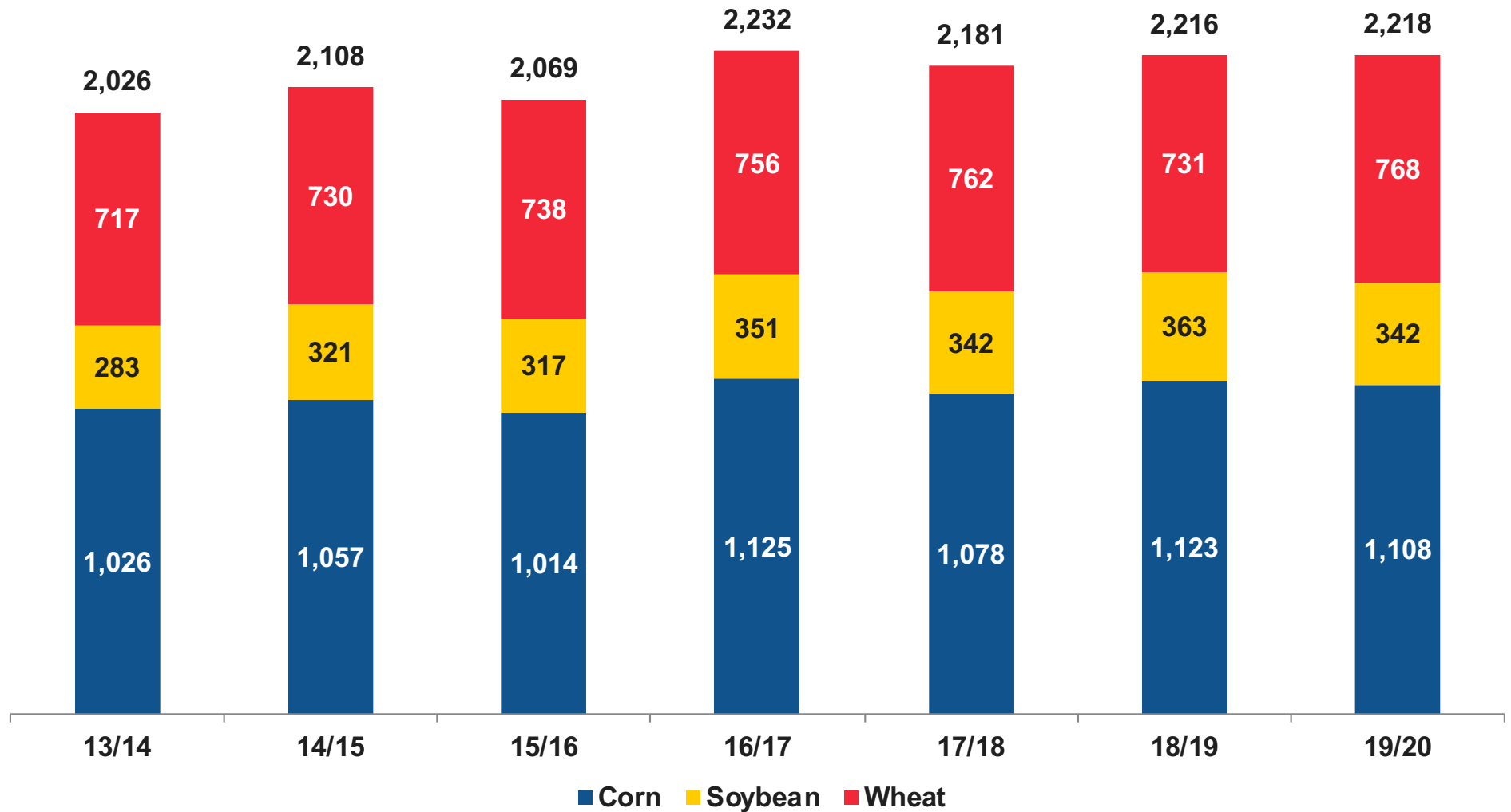


# Global and US Market S & D Dynamics

NATIONAL GRAIN CAR COUNCIL THURSDAY SEP 12, 2019

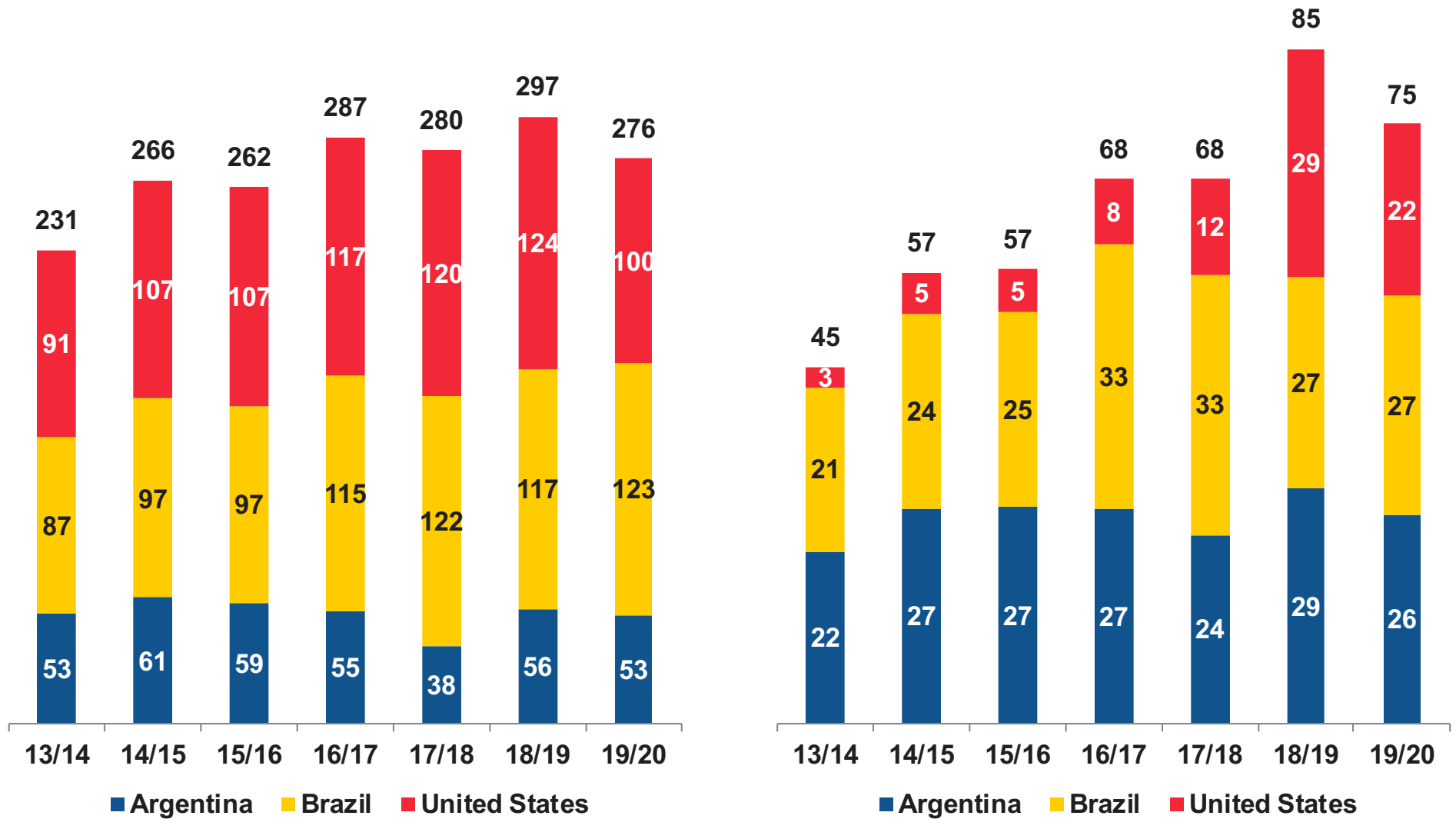


# World Production: Corn, Soybean, Wheat (MMT)

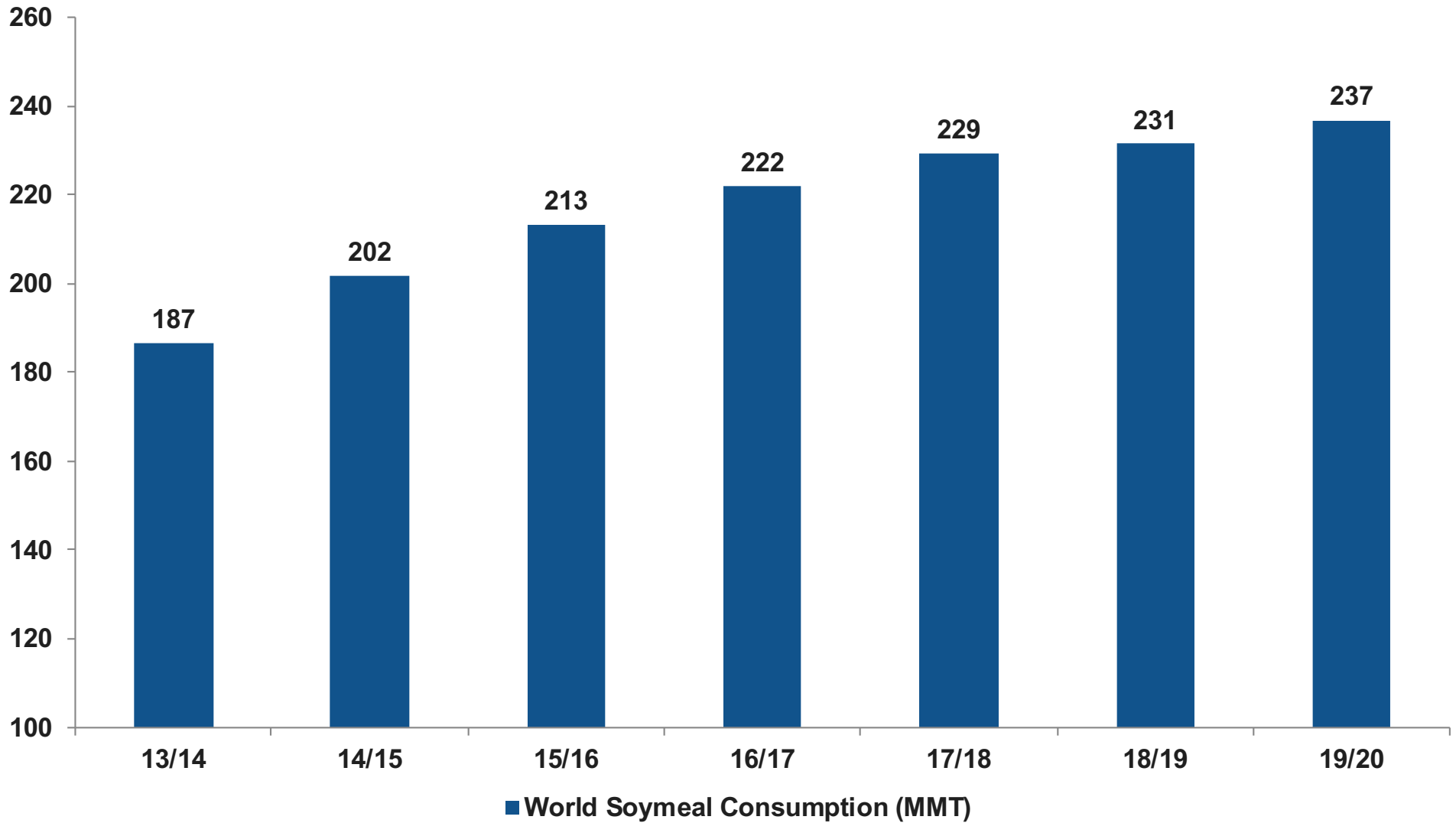


Source: USDA

# Soybean Major Origin Prod & Ending Stocks (MMT)



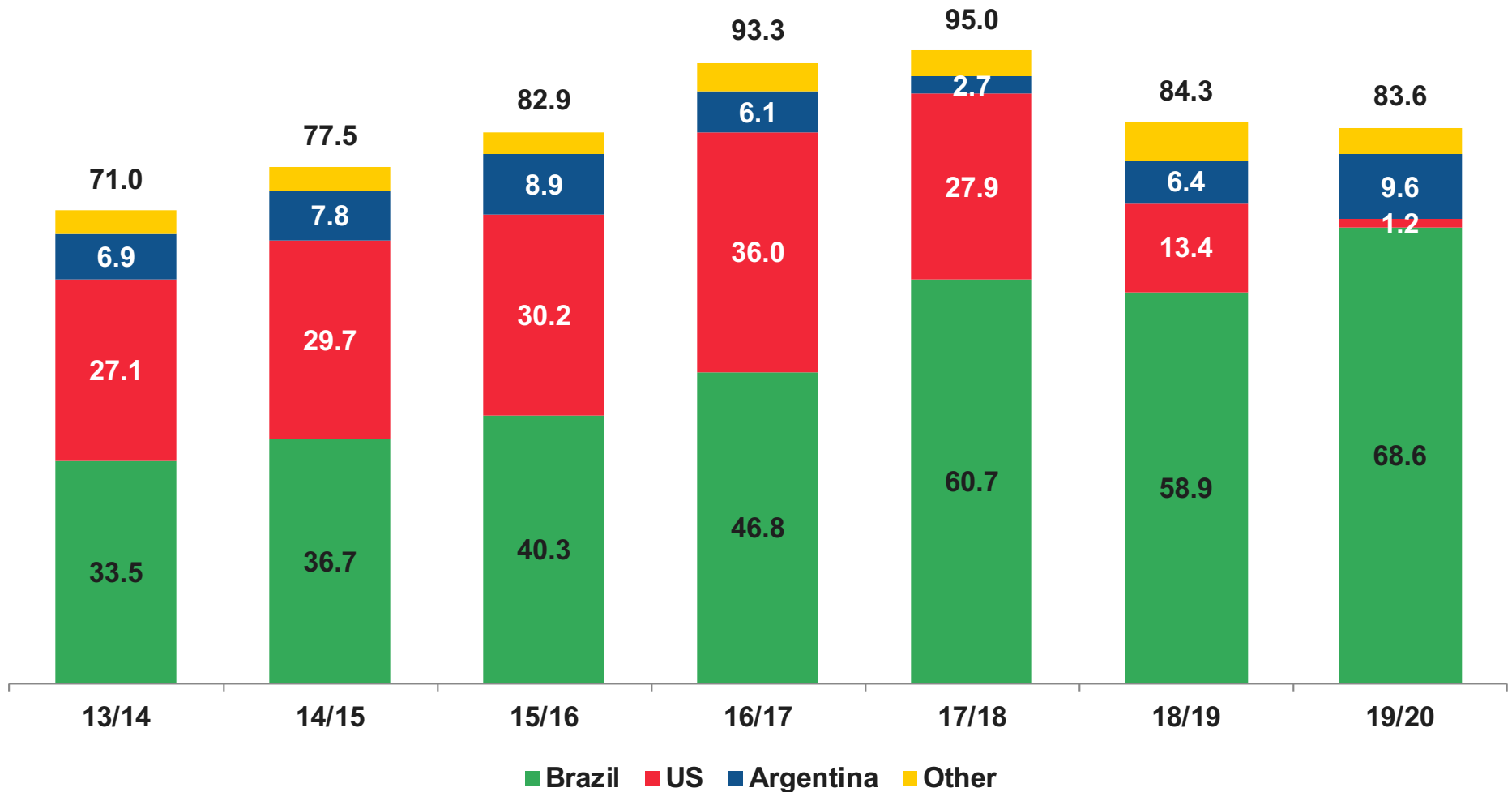
# World Soymeal Consumption Oct/Sep (MMT)



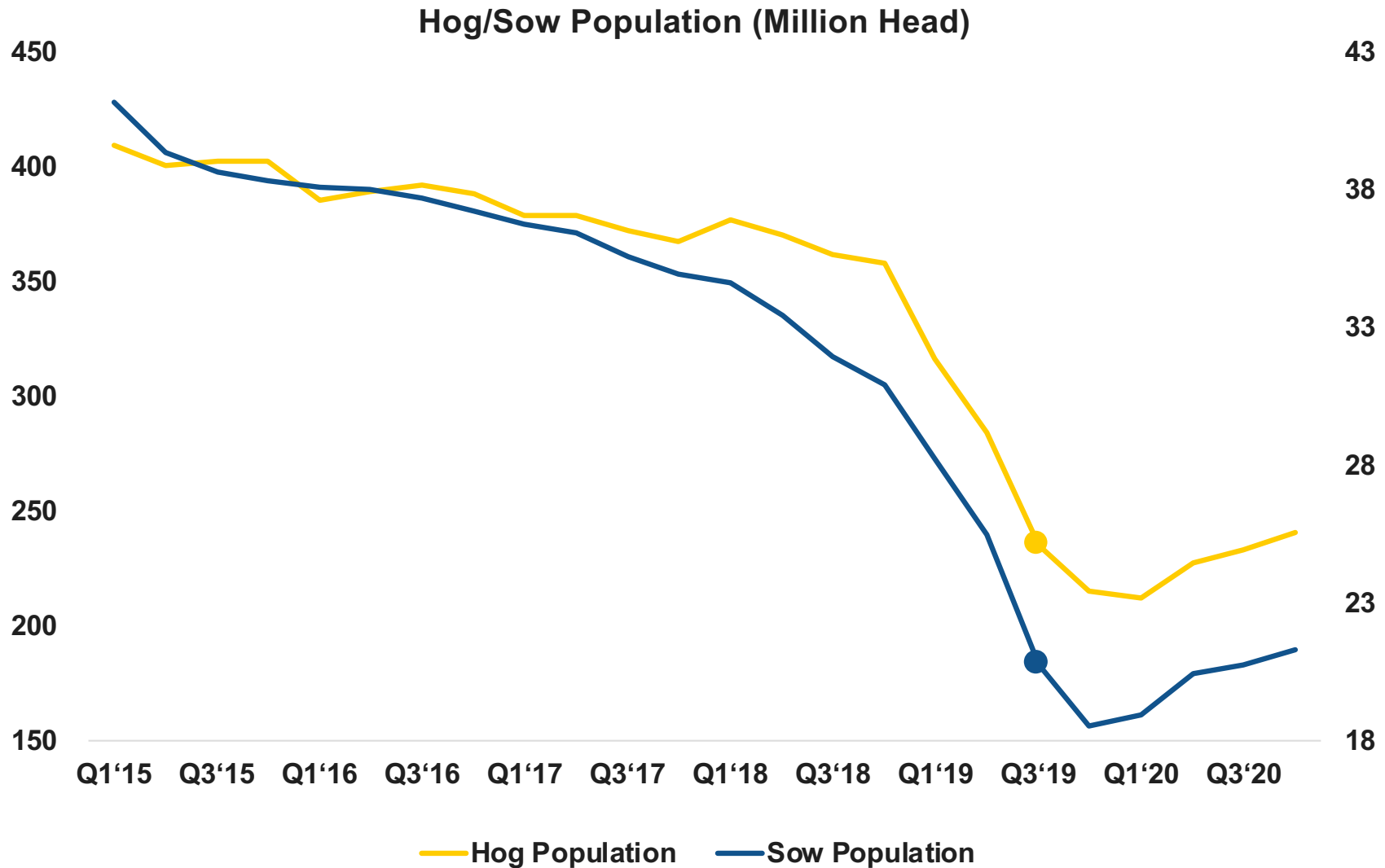
Source: USDA

# China Soybean Imports by Origin (MMT)

China Soybean Imports by Origin (MMT)



# China Hog/Sow Population (Mil Head)





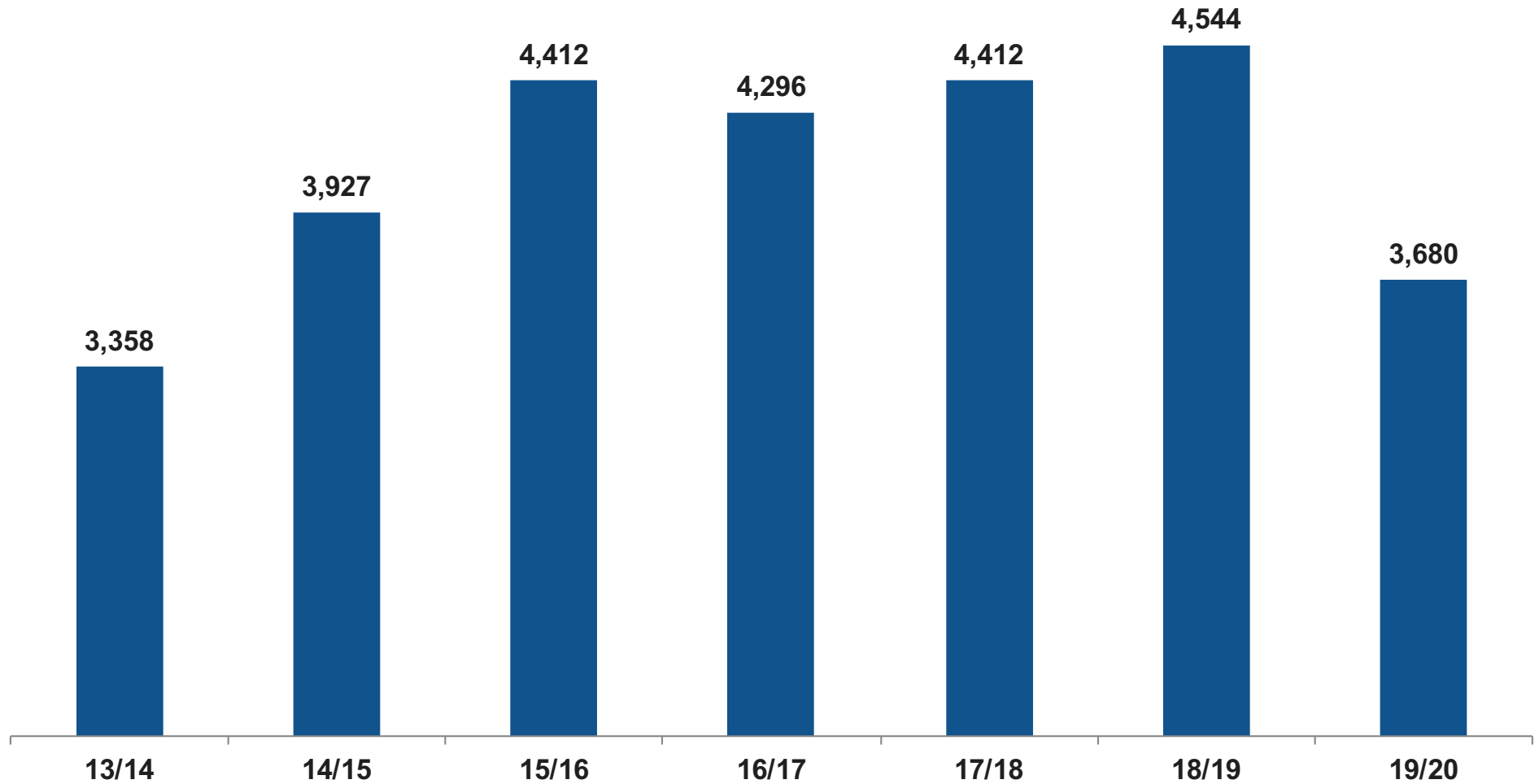
# US Soybeans S&D

## SOYBEANS - US BALANCE

Mln bu SEP/AUG	13/14	14/15	15/16	16/17	17/18	18/19	19/20
<b>Planted Acres (Mln Acres)</b>	76.8	83.3	90.2	83.5	90.2	89.2	76.7
<b>Harvested Acres</b>	76.3	82.6	89.5	82.7	89.5	88.1	75.9
<b>Percent Harvested</b>	99.3%	99.2%	99.2%	99.0%	99.2%	98.8%	99.0%
<b>Yield Bu/Acre</b>	44.0	47.5	49.3	51.9	49.3	51.6	48.5
<b>Beg. Stocks</b>	141	92	302	197	302	438	1,070
<b>Production</b>	3,358	3,927	4,412	4,296	4,412	4,544	3,680
<b>Imports</b>	72	33	22	22	22	17	20
<b>Total Supply</b>	<b>3,570</b>	<b>4,052</b>	<b>4,736</b>	<b>4,515</b>	<b>4,736</b>	<b>4,999</b>	<b>4,771</b>
<b>Crush</b>	1,734	1,873	2,055	1,901	2,055	2,065	2,115
<b>Feed, Seed &amp; Residual</b>	107	145	109	147	109	164	126
<b>Domestic Use</b>	1,841	2,018	2,164	2,048	2,164	2,229	2,241
<b>Exports</b>	1,638	1,843	2,134	2,166	2,134	1,700	1,775
<b>Total Use</b>	<b>3,478</b>	<b>3,862</b>	<b>4,297</b>	<b>4,214</b>	<b>4,297</b>	<b>3,929</b>	<b>4,016</b>
<b>Ending Stocks</b>	<b>92</b>	<b>191</b>	<b>438</b>	<b>302</b>	<b>438</b>	<b>1070</b>	<b>755</b>
<b>Bean Stocks to use%</b>	2.6%	4.9%	10.2%	7.2%	10.2%	27.2%	18.8%
<b>Stocks in Days of use</b>	10	18	37	26	37	99	69
<b>Bean Equiv Stocks</b>	102	202	461	319	461	1,089	772
<b>Bean Equiv Stocks to use%</b>	2.9%	5.2%	10.7%	7.6%	10.7%	27.7%	19.2%

Source: USDA

# US Soybean Production (mbu)



Source: USDA

# US Soymeal S&D

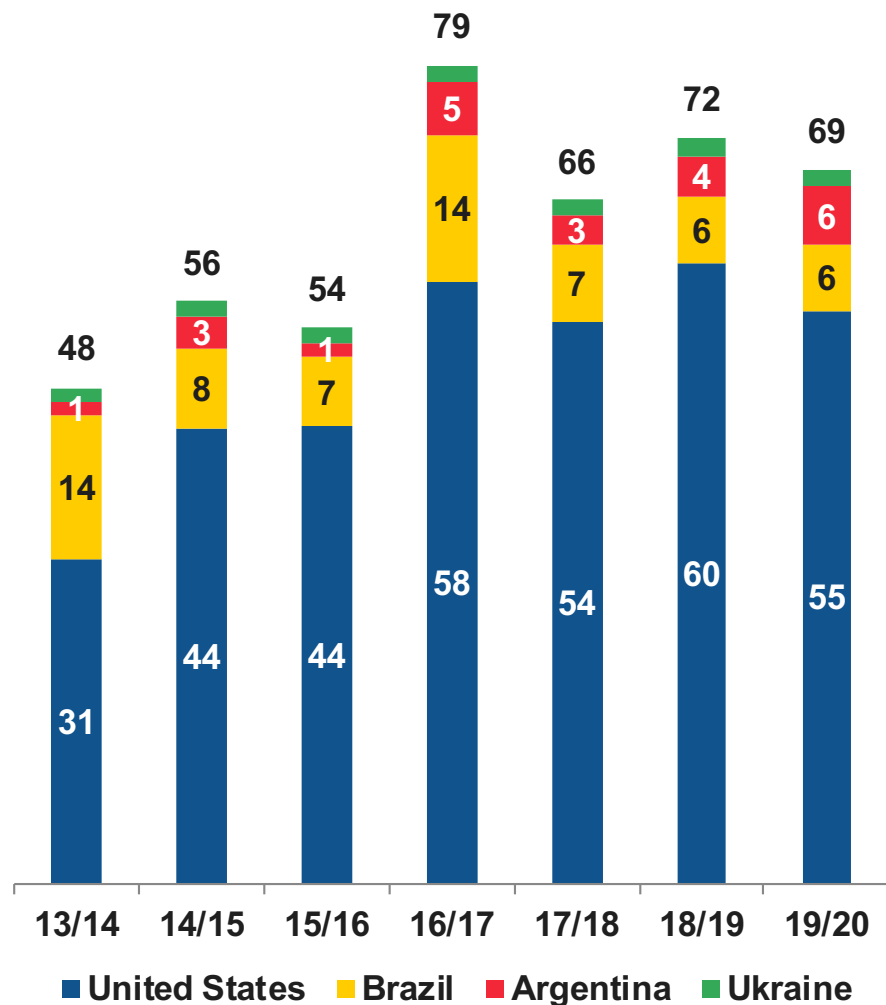
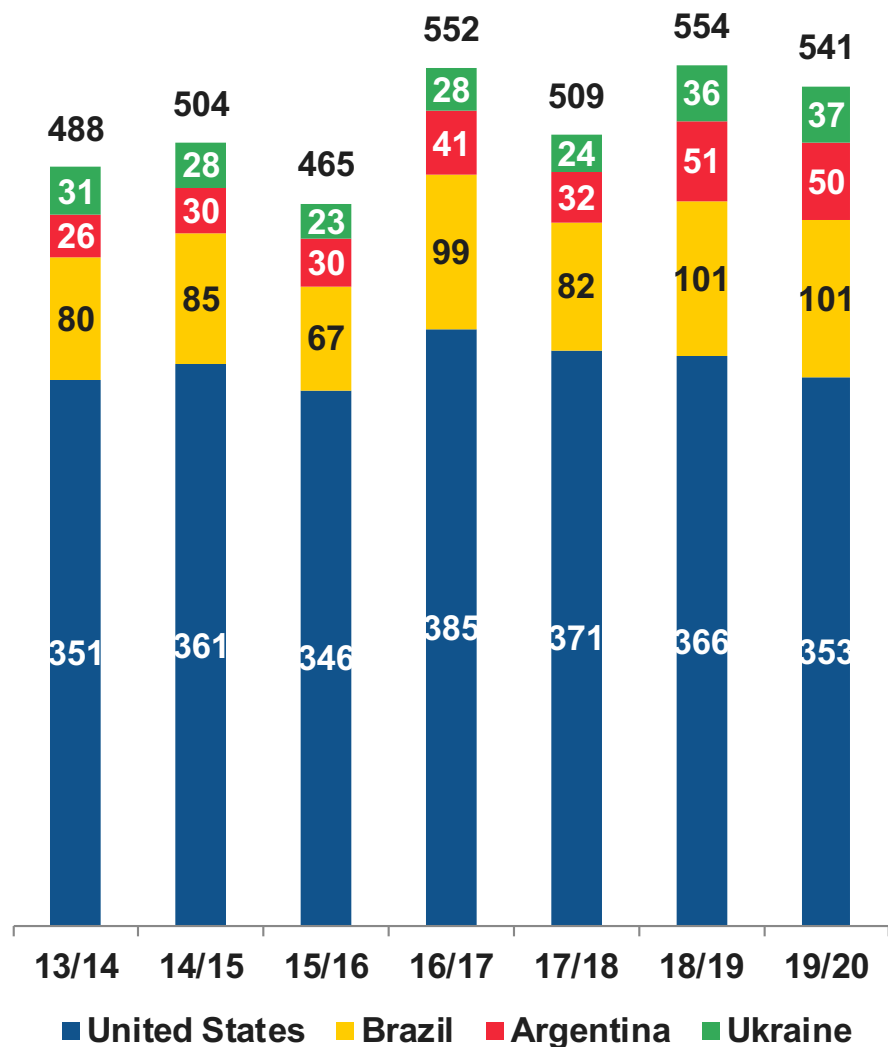
## SOYBEAN MEAL - US BALANCE

T Short tons OCT/SEP

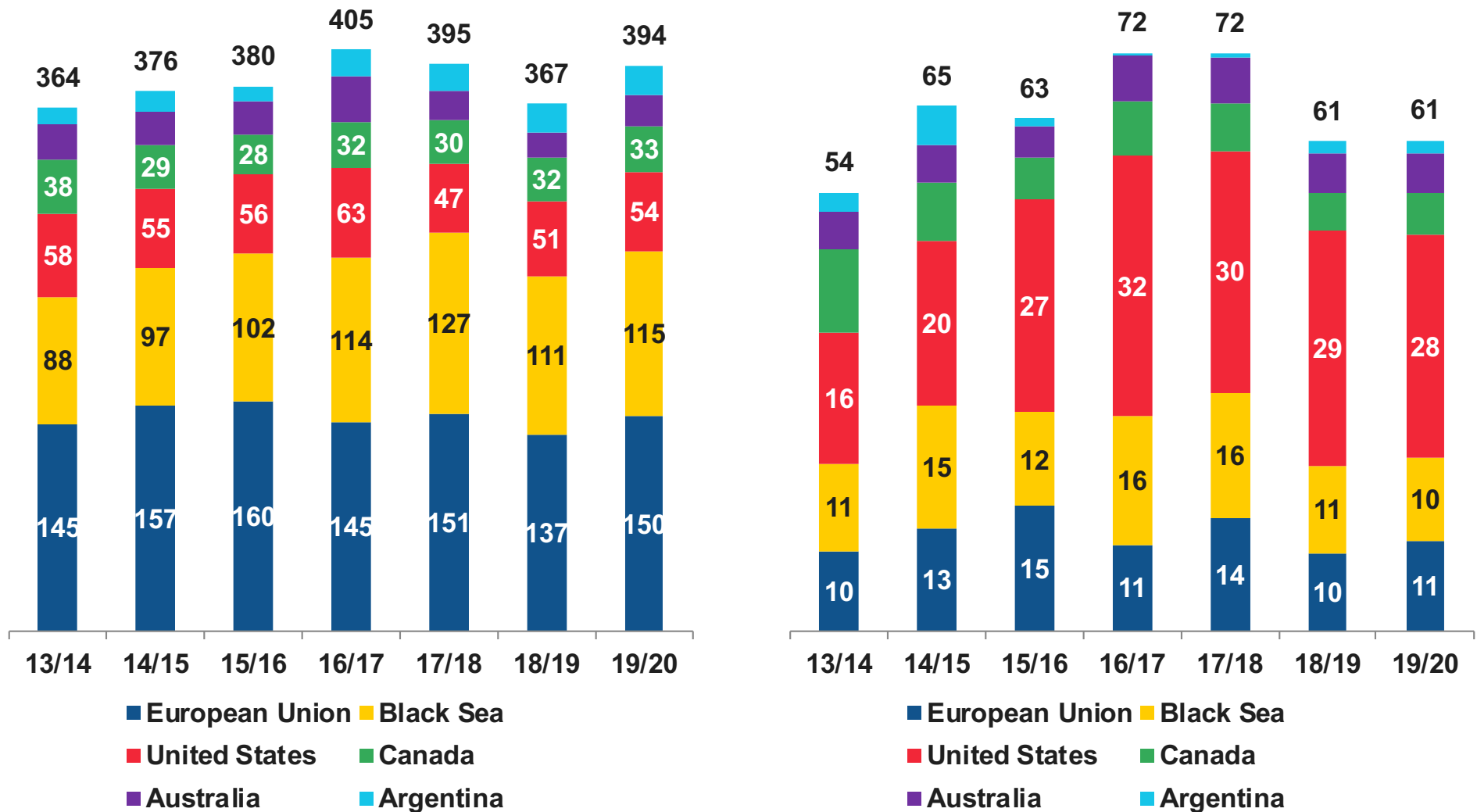
	13/14	14/15	15/16	16/17	17/18	18/19	19/20
<b>Crush Oct/Sep</b>	1,825	1,903	1,890	1,908	2,055	2,065	2,115
<b>Beg. Stocks</b>	275	250	260	555	401	555	450
<b>Production</b>	40,685	45,062	49,226	44,787	49,226	48,420	49,650
<b>Yield lbs/bushel</b>	44.59	47.36	52.09	46.95	47.91	46.90	46.95
<b>Imports</b>	383	333	483	350	483	725	500
<b>Total Supply</b>	<b>41343</b>	<b>45645</b>	<b>50109</b>	<b>45400</b>	<b>50109</b>	<b>49700</b>	<b>50600</b>
<b>Exports</b>	11,546	13,150	14,016	11,580	14,016	13,550	13,700
<b>Domestic</b>	29,547	32,235	35,537	33,420	35,537	35,700	36,500
<b>Total Use</b>	<b>41093</b>	<b>45384</b>	<b>49554</b>	<b>45000</b>	<b>49554</b>	<b>49250</b>	<b>50200</b>
<b>End. Stocks</b>	<b>250</b>	<b>260</b>	<b>555</b>	<b>401</b>	<b>555</b>	<b>450</b>	<b>400</b>
<b>Stocks to Use %</b>	0.6%	0.6%	1.1%	0.9%	1.1%	0.9%	0.8%
<b>Stocks in Days of use</b>	2.2	2.1	4.1	3.3	4.1	3.3	2.9

Source: USDA

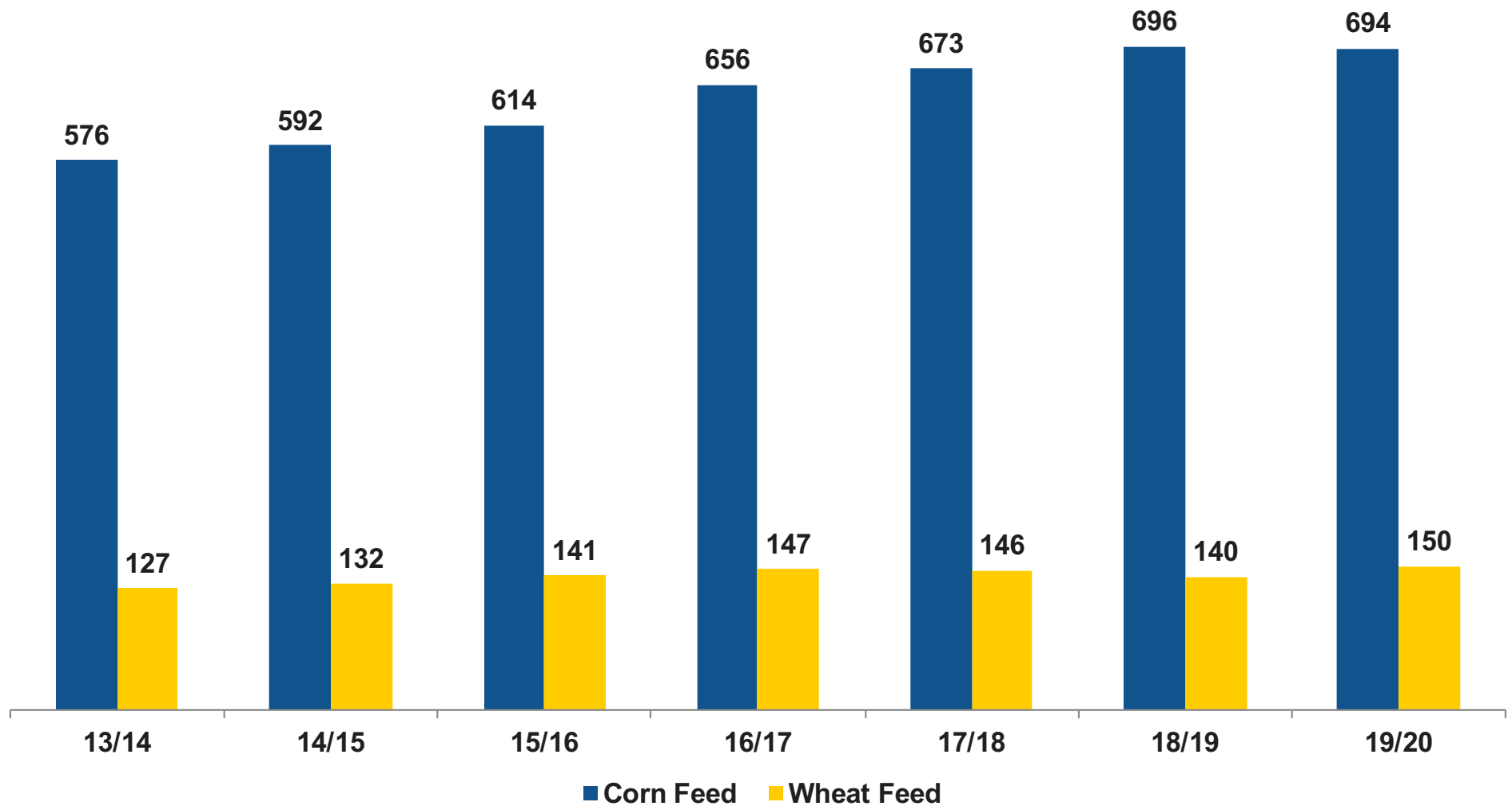
# Major Origin Corn Prod & Ending Stocks (MMT)



# Big 6 Wheat Production & Ending Stocks (MMT)



# Global Feed Consumption (MMT)



Source: USDA



# US Wheat S&D (MBU)

## WHEAT - US Total MBU

Jun/May	13/14	14/15	15/16	16/17	17/18	18/19	19/20
<b>PLANTED Area mln acres</b>	56.2	56.8	55.0	50.1	46.1	47.8	45.6
<b>HARVESTED Area mln acres</b>	45.3	46.4	47.3	43.8	37.6	39.6	38.4
<b>YIELD bu/acre</b>	44.7	43.7	43.6	52.6	46.4	47.6	51.6
<b>Beginning Stocks</b>	591	591	753	976	1181	1099	1072
<b>Production</b>	2028	2028	2062	2308	1741	1884	1980
<b>Imports</b>	147	147	111	118	158	135	136
<b>TOTAL SUPPLY</b>	<b>2766</b>	<b>2766</b>	<b>2926</b>	<b>3402</b>	<b>3080</b>	<b>3118</b>	<b>3188</b>
<b>Domestic Use</b>	1159	1159	1176	1166	1080	1110	1199
<b>Exports</b>	855	855	774	1055	901	936	975
<b>TOTAL DEMAND</b>	<b>2,014</b>	<b>2,014</b>	<b>1,950</b>	<b>2,221</b>	<b>1,981</b>	<b>2,046</b>	<b>2,174</b>
<b>CARRY OUT</b>	<b>752</b>	<b>752</b>	<b>976</b>	<b>1,181</b>	<b>1,099</b>	<b>1,072</b>	<b>1,014</b>
<b>Stocks to Use</b>	37%	37%	50%	53%	55%	52%	47%
<b>Stocks Express in Days of Use</b>	136	136	183	194	203	191	170

Source: USDA

# US Corn S&D Sep/Aug (MBU)

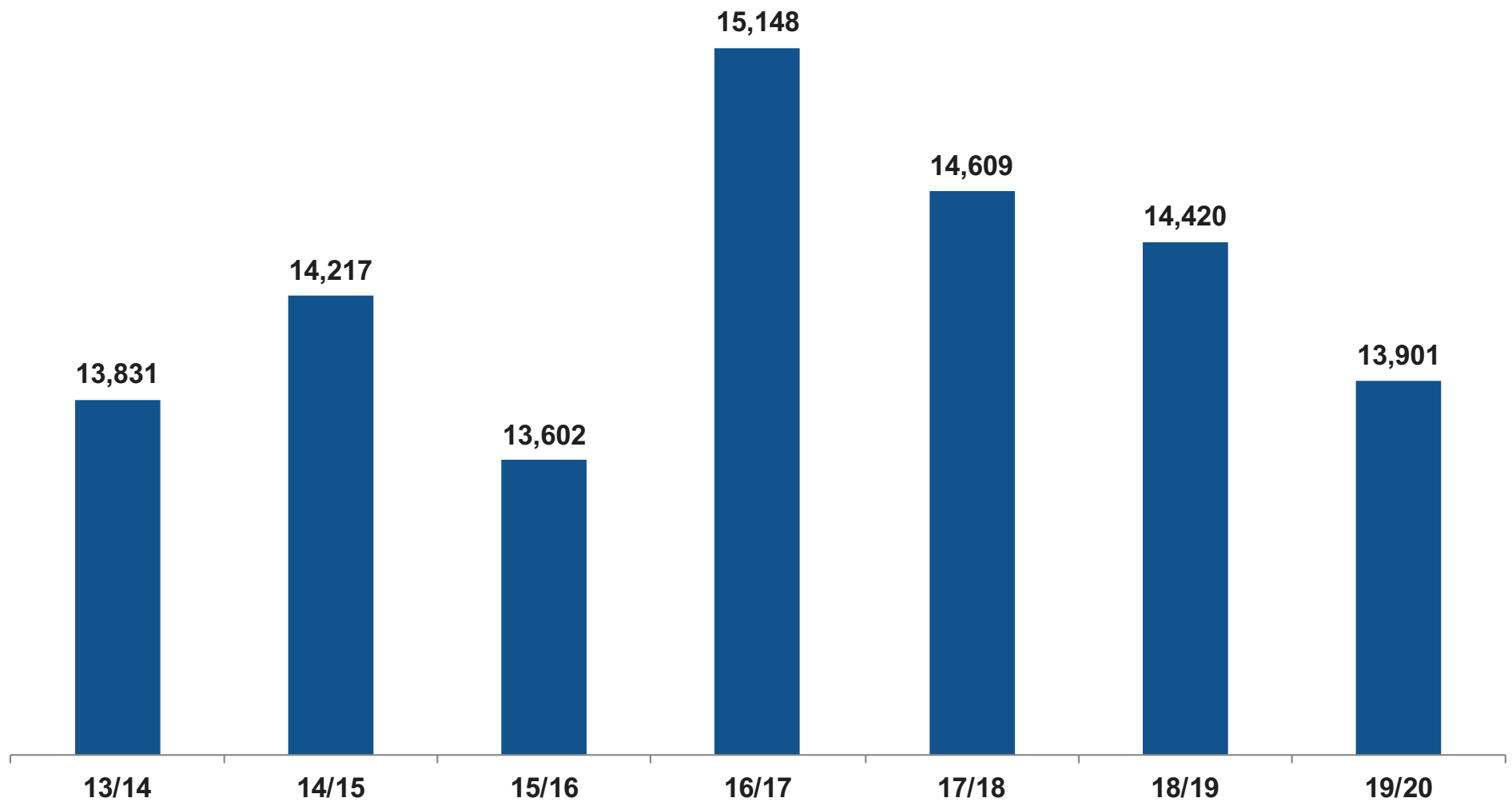
## CORN - US BALANCE

### MBU

Sep/Aug	13/14	14/15	15/16	16/17	17/18	18/19	19/20
<b>PLANTED Area mln acres</b>	95.4	90.6	88.0	94.0	90.2	89.1	90.0
<b>HARVESTED Area mln acres</b>	87.5	83.1	80.8	86.7	82.7	81.7	82.0
<b>YIELD bu/acre</b>	158.1	171.1	168.3	174.7	176.7	176.5	169.5
<b>Beginning Stocks</b>	821	1,232	1,731	1,737	2,293	2,140	2,360
<b>Production</b>	13,831	14,217	13,602	15,148	14,609	14,420	13,901
<b>Imports</b>	36	32	68	57	36	30	50
<b>TOTAL SUPPLY</b>	<b>14,688</b>	<b>15,481</b>	<b>15,401</b>	<b>16,942</b>	<b>16,939</b>	<b>16,590</b>	<b>16,311</b>
<b>FSI</b>	6,531	6,595	6,647	6,885	7,057	6,855	6,905
<b>FSI for fuel</b>	5,124	5,200	5,224	5,432	5,605	5,425	5,475
<b>FSI not for fuel</b>	1,407	1,395	1,423	1,453	1,452	1,430	1,430
<b>Feed and Residual</b>	5,004	5,287	5,118	5,470	5,304	5,275	5,175
<b>Exports</b>	1,921	1,867	1,899	2,294	2,438	2,100	2,050
<b>TOTAL DEMAND</b>	<b>13,456</b>	<b>13,750</b>	<b>13,664</b>	<b>14,649</b>	<b>14,798</b>	<b>14,230</b>	<b>14,130</b>
<b>CARRY OUT</b>	<b>1,232</b>	<b>1,731</b>	<b>1,737</b>	<b>2,293</b>	<b>2,140</b>	<b>2,360</b>	<b>2,181</b>
<b>Stocks to Use</b>	9%	13%	13%	16%	14%	17%	15%
<b>Stocks Express in Days of Use</b>	33	46	46	57	53	61	56

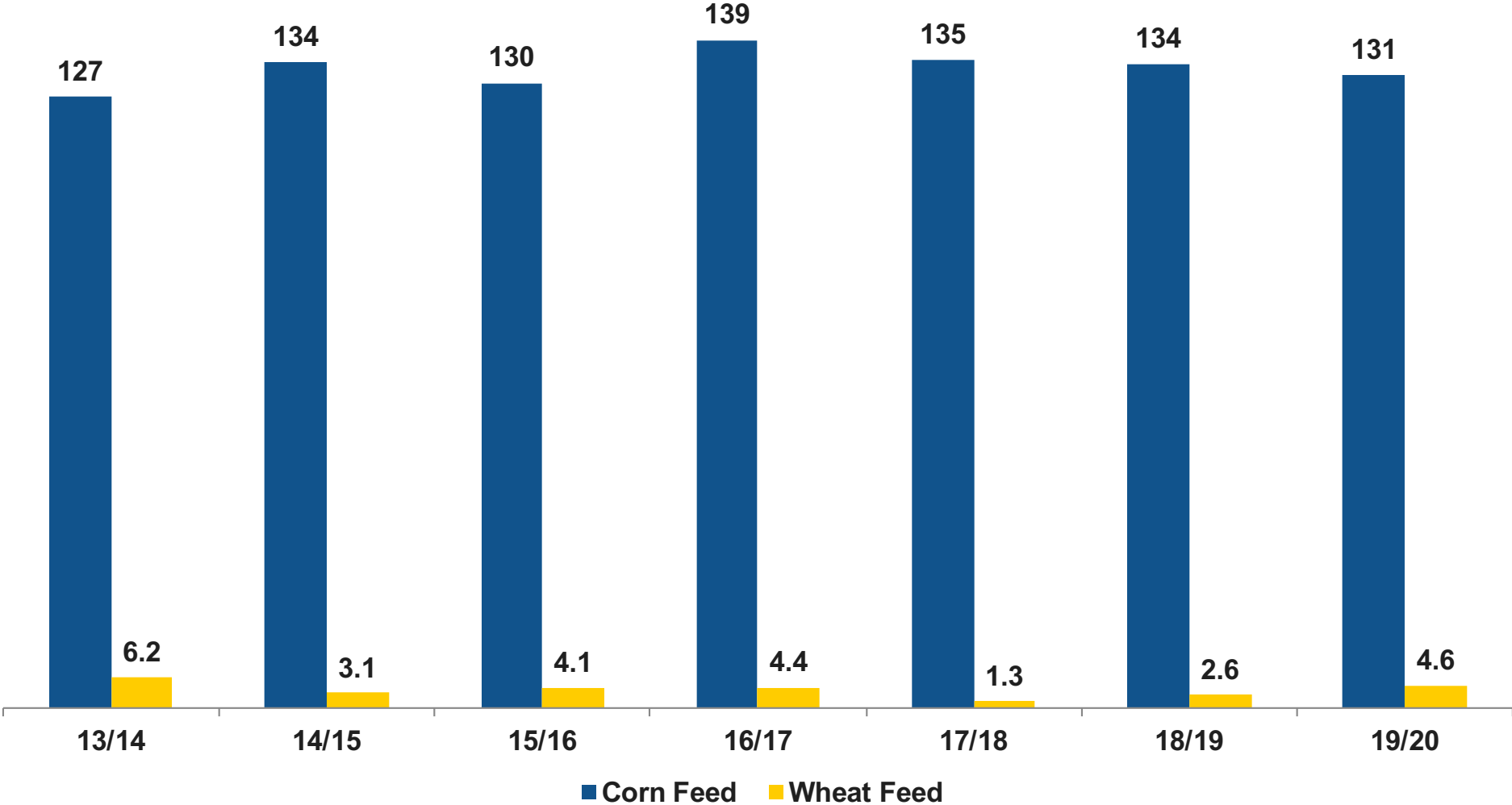
Source: USDA

# US Corn Production (mbu)



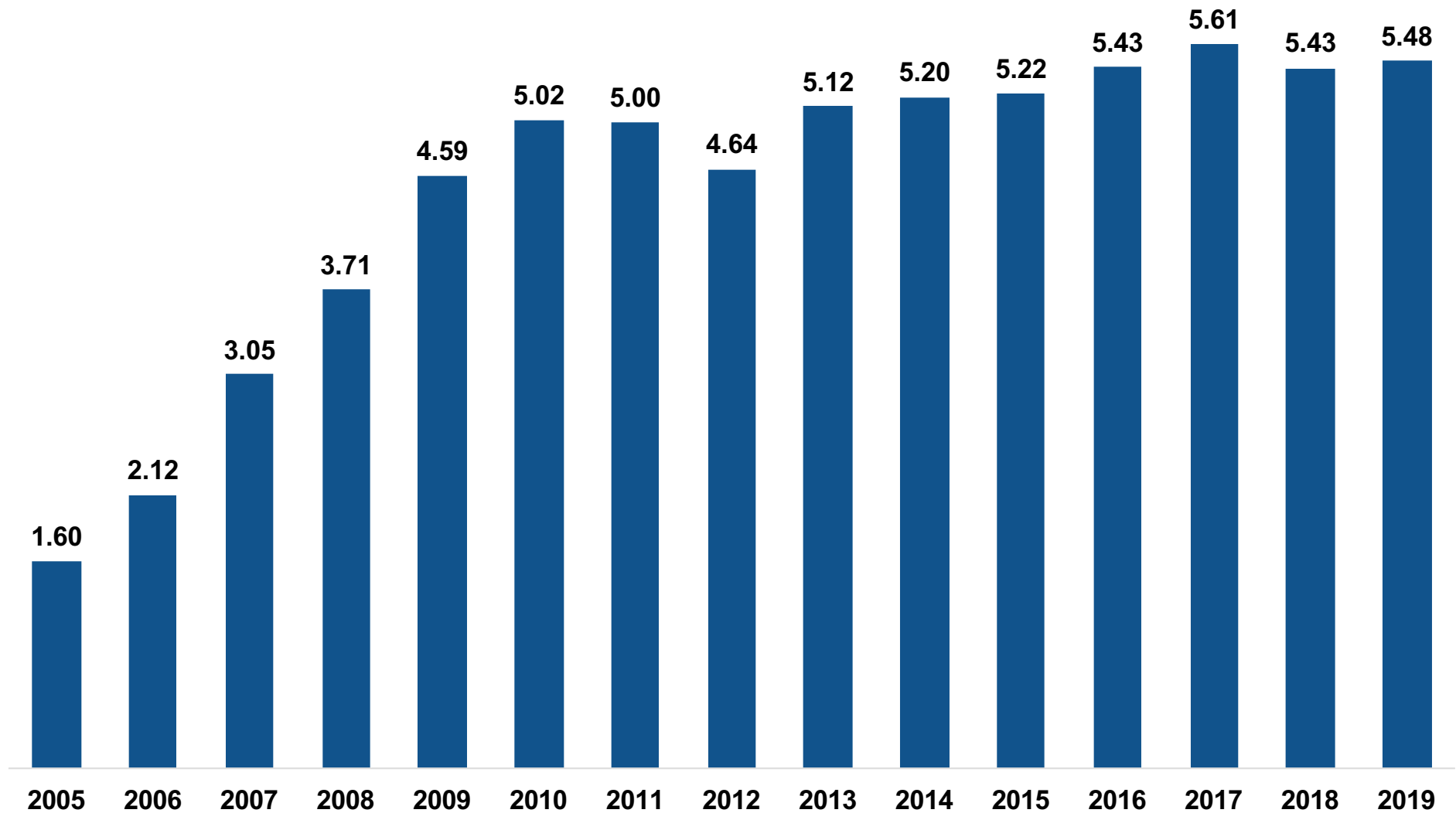
Source: USDA

# US Feed Consumption (MMT)



Source: USDA

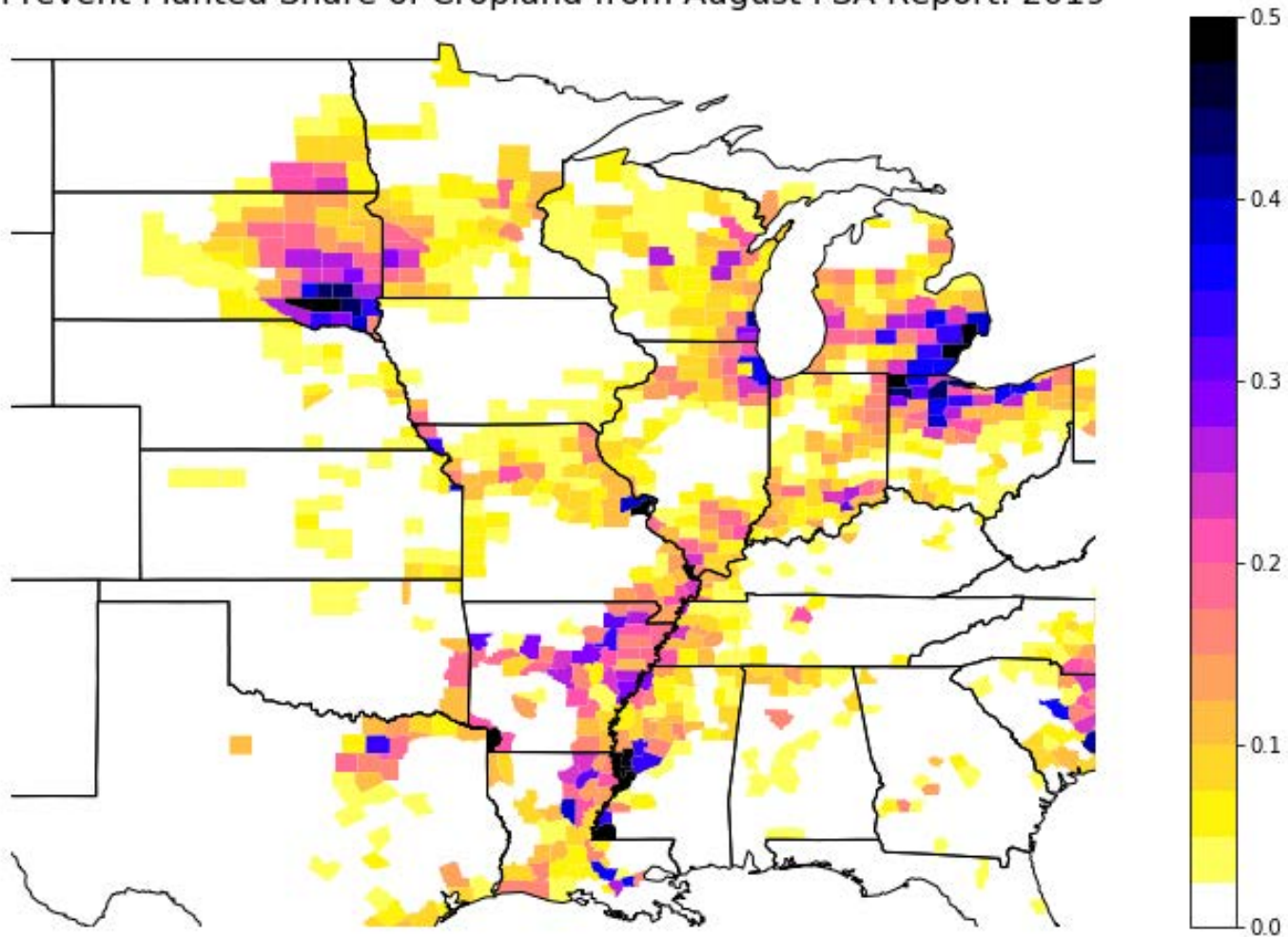
# US Corn Use for Ethanol (BBU)



Source: USDA

# FSA Share of Prevent Plant

Prevent Planted Share of Cropland from August FSA Report: 2019







# National Grain Car Council



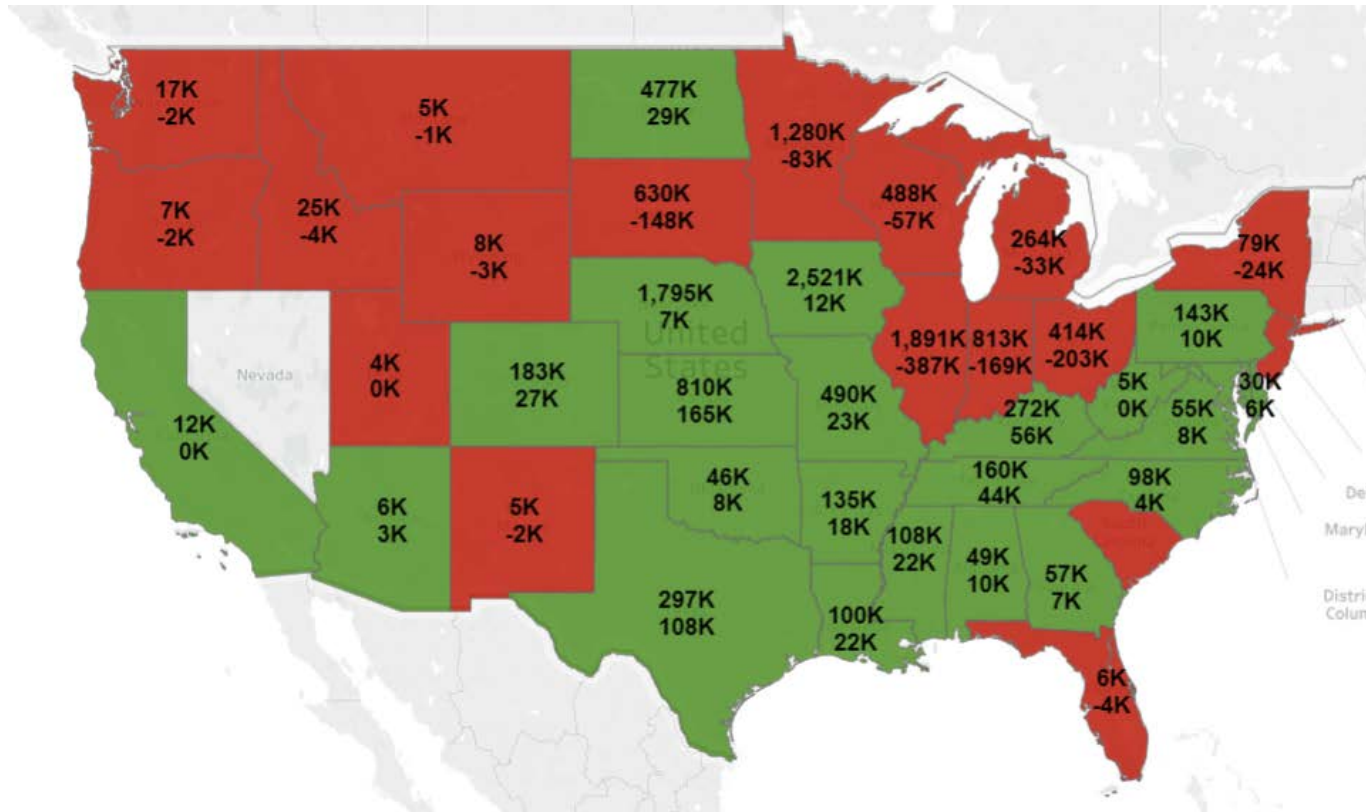
St Louis

September 12, 2019

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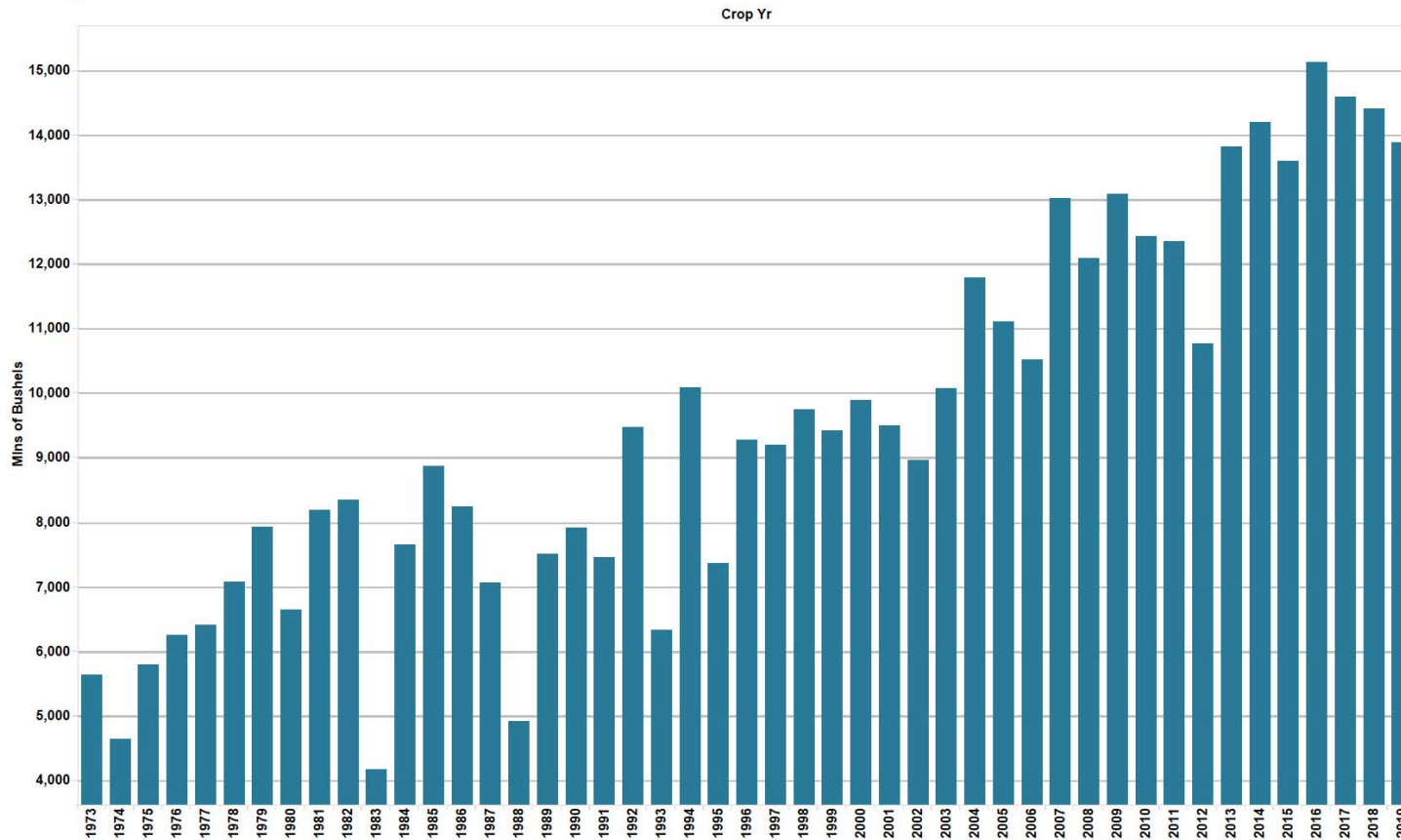


# US Corn Production 2019 vs 2018

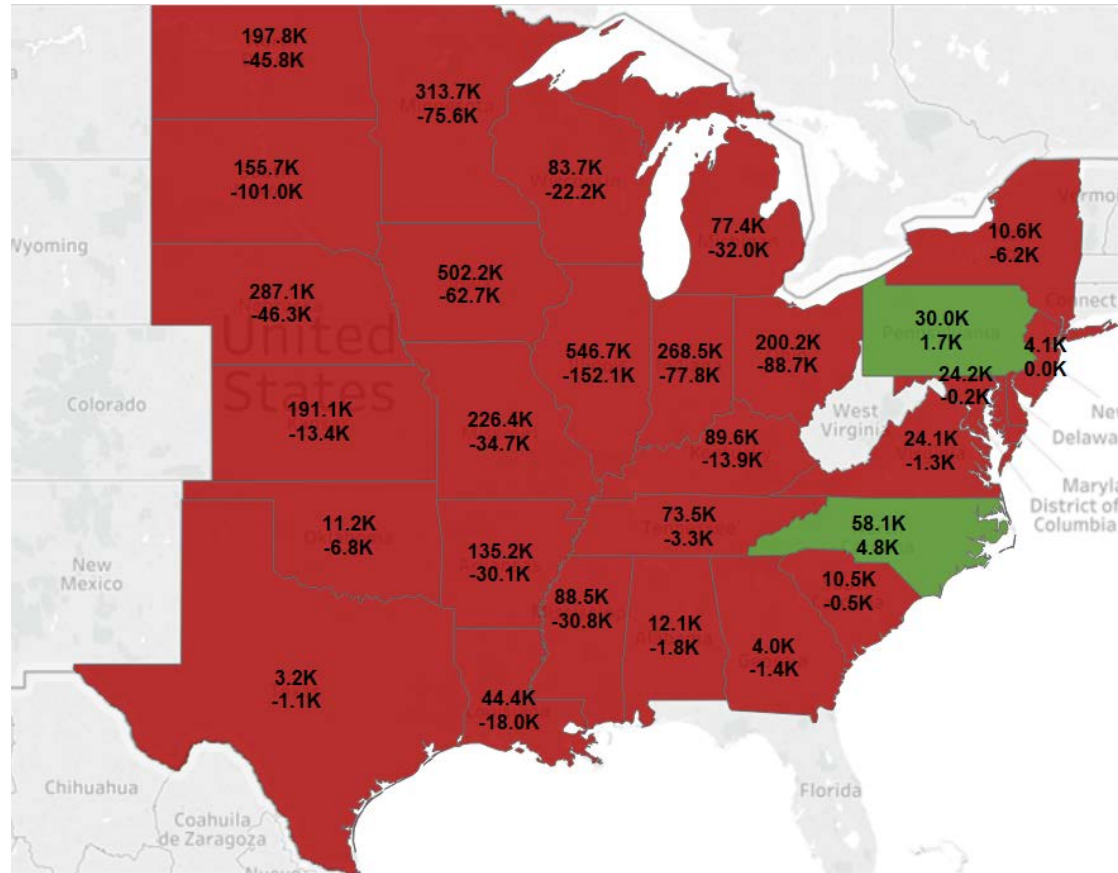


# US Corn Production

US Corn Production

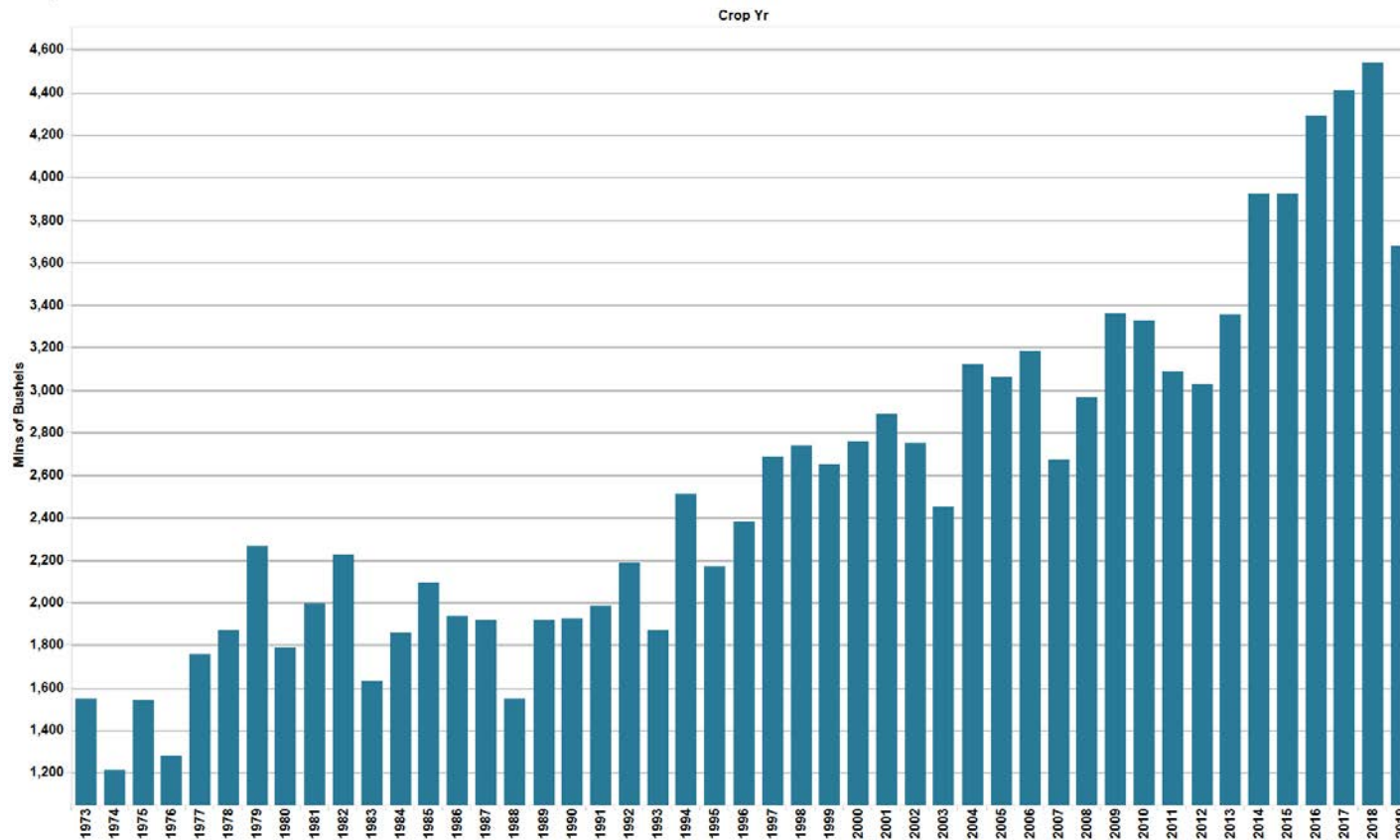


# US Soybean Production 2019 vs 2018



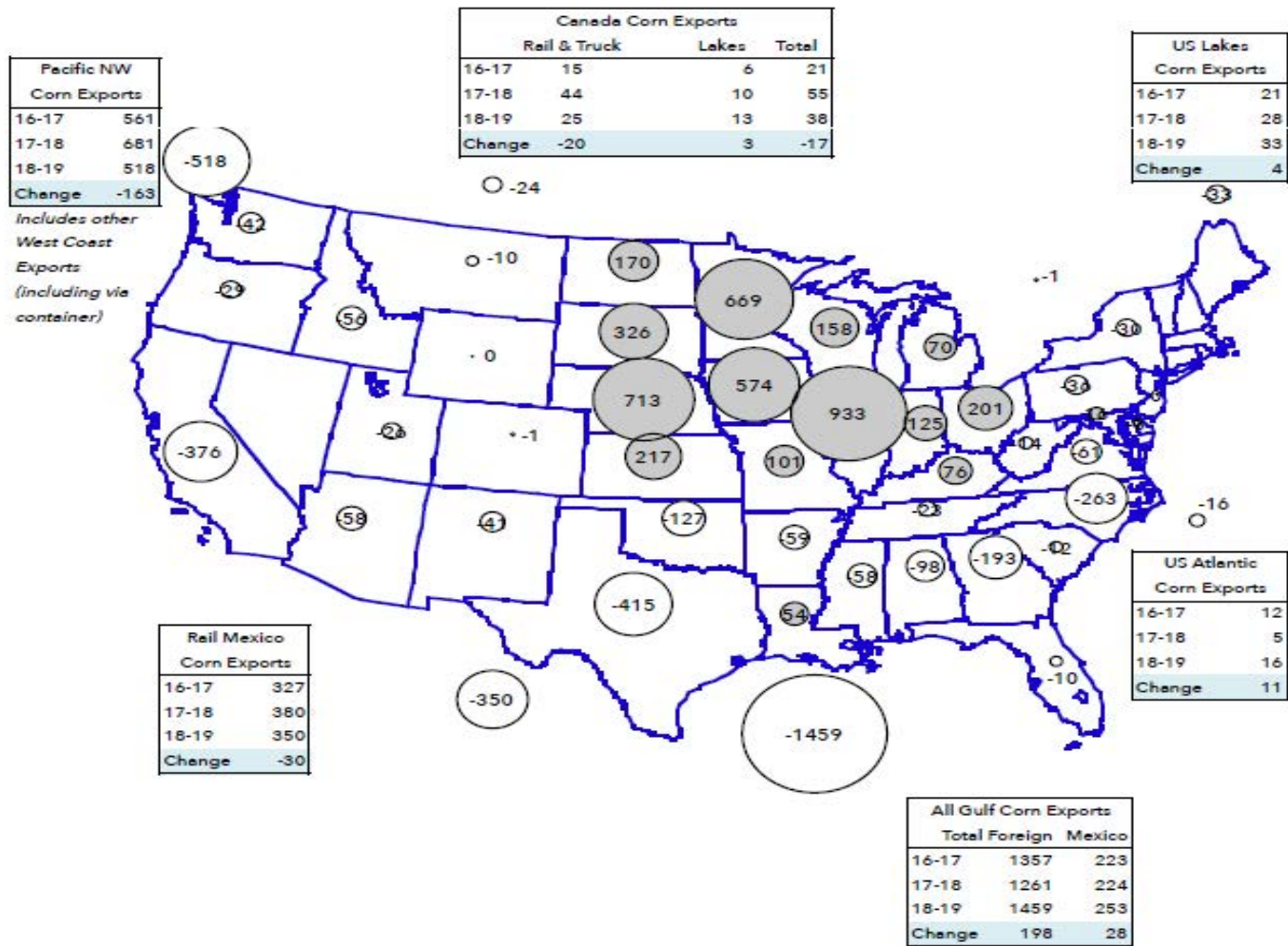
# US Bean Production

US Soybean Production



# 2018-2019 CORN EXPORT/IMPORT

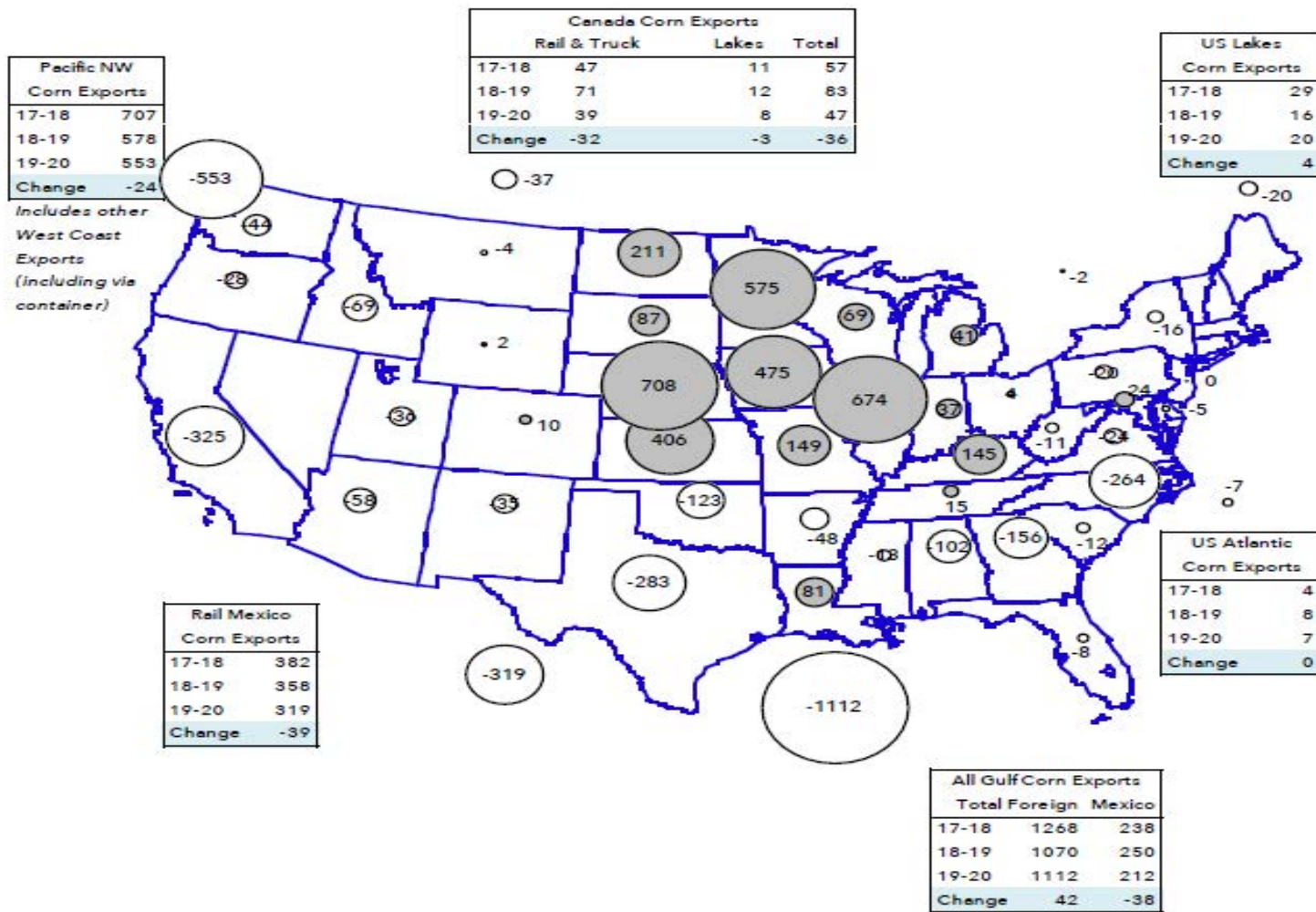
## Corn Net Exports (+) and Net Imports (-), 18-19





# 2019-2020 CORN EXPORT/IMPORT

## Corn Net Exports (+) and Net Imports (-), 19-20



# United States Domestic Corn Consumption

## UNITED STATES Corn Supply-Demand Detail

PRX\_Corn, SDU, Aug-12-19

Item	Unit	Crop year (Sep-Aug)										
		09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
Carry-in	mil bu	1673	1708	1128	989	821	1232	1731	1737	2295	2140	2360
Production	mil bu	13067	12425	12314	10755	13829	14216	13602	15148	14609	14420	13901
Supply	mil bu	14773	14161	13471	11904	14686	15479	15401	16885	16939	16610	16301
Disappearance (Use)	mil bu	13066	13033	12482	11083	13454	13748	13664	14590	14799	14250	14122
Residual use	mil bu	1281	634	452	362	773	943	877	1114	658	663	541
Feed use in US	mil bu	4049	4243	4178	4079	4374	4290	4214	4285	4566	4612	4649
of which,												
Dairy	mil bu	755	789	776	775	839	816	798	811	845	827	829
Beef cattle	mil bu	1140	1212	1195	1135	1191	1158	1130	1149	1262	1264	1267
Hogs	mil bu	905	946	944	939	985	1003	1009	1026	1127	1150	1178
Poultry	mil bu	1156	1200	1169	1135	1256	1213	1181	1201	1237	1276	1279
Other	mil bu	93	97	94	94	102	98	96	98	95	94	94
Processing in state	mil bu	5753	6326	6305	5913	6387	6649	6675	6956	7137	6855	6892
of which,												
Dry mill fuel ethanol	mil bu	4039	4461	4425	4060	4527	4767	4793	4957	5125	4987	5004
	mil gals	11059	12258	12201	11234	12572	13285	13404	13912	14434	14093	14191
DDG production	thou mt	31373	33997	33456	30581	33688	35027	36144	37178	37995	37324	37450
Corn disp by DDG/CGF	mil bu	1114	1222	1187	1055	1015	1026	1130	1130	1212	1212	1212
Wet mill fuel ethanol	mil bu	481	481	481	481	481	481	481	546	561	523	523
	mil gals	1316	1321	1326	1330	1335	1340	1345	1532	1579	1477	1482
Total fuel ethanol	mil bu	4520	4942	4905	4540	5008	5248	5274	5503	5686	5510	5527
	mil gals	12376	13579	13527	12565	13907	14625	14748	15444	16013	15571	15674
Total domestic use	mil bu	11083	11203	10935	10354	11534	11882	11766	12355	12361	12130	12082
Foreign Exports	mil bu	-1979	-1831	-1539	-730	-1920	-1867	-1899	-2294	-2438	-2100	-2050
Carry-out	mil bu	1708	1128	989	821	1232	1731	1737	2295	2140	2360	2179

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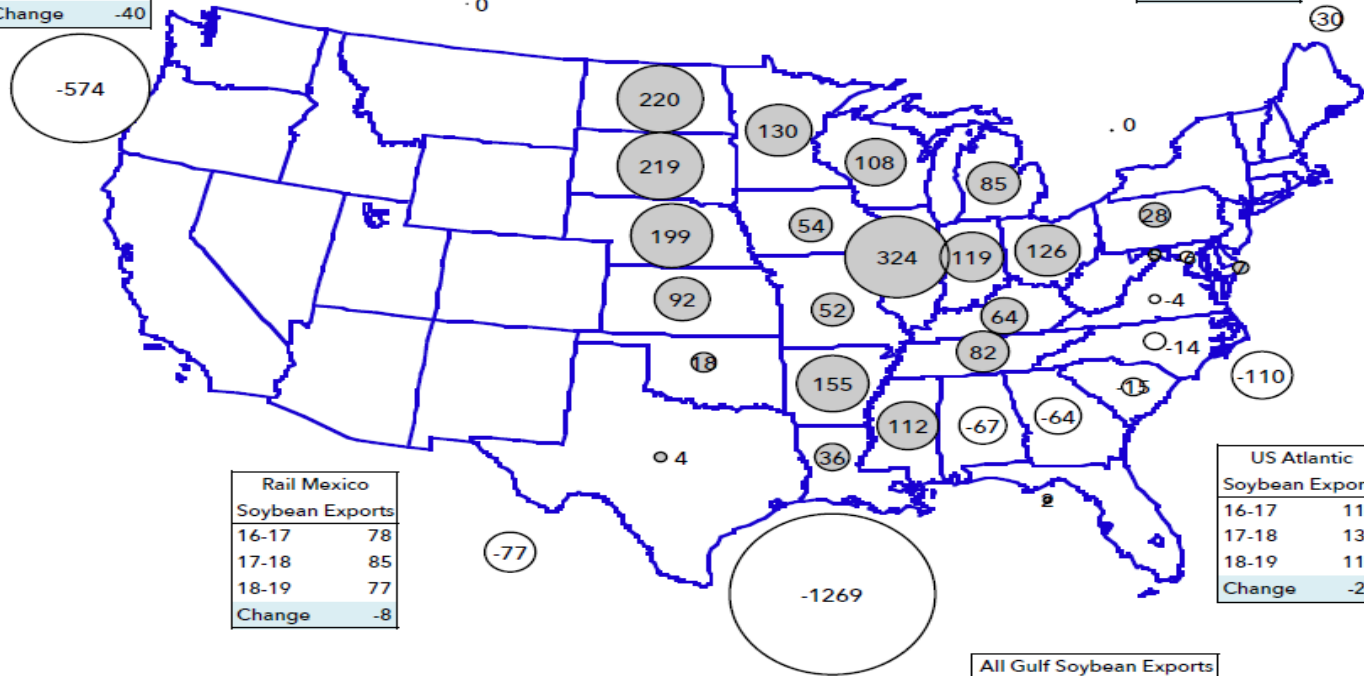
# 2018-2019 SOYBEAN EXPORT/IMPORT

## Soybean Net Exports (+) and Net Imports (-), 18-19 Million Bushels

PRX\_Soybeans.xlsm, SDU, Aug-10-18

Pacific NW	
Soybean Exports	
16-17	626
17-18	615
18-19	574
Change	-40

US Lakes	
Soybean Exports	
16-17	29
17-18	35
18-19	30
Change	-5



Rail Mexico	
Soybean Exports	
16-17	78
17-18	85
18-19	77
Change	-8

US Atlantic	
Soybean Exports	
16-17	113
17-18	133
18-19	110
Change	-24

All Gulf Soybean Exports		
	Total	Mexico
16-17	1319	64
17-18	1242	59
18-19	1269	63
Change	27	4



# 2019-2020 SOYBEAN EXPORT/IMPORT

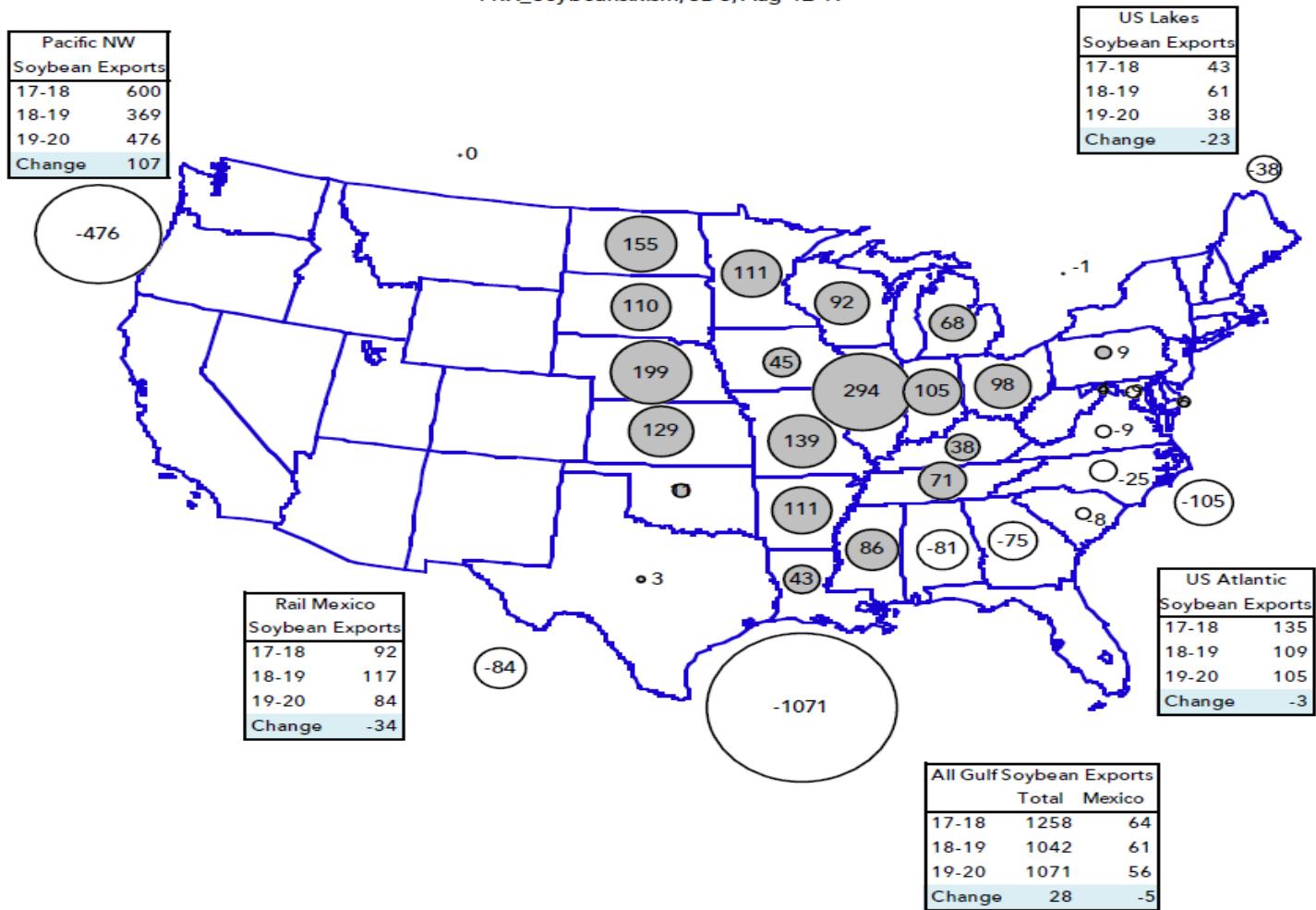
PRX The ProExporter Network®

Grain, Oilseed & Biofuel Fundamentals 08-12-19

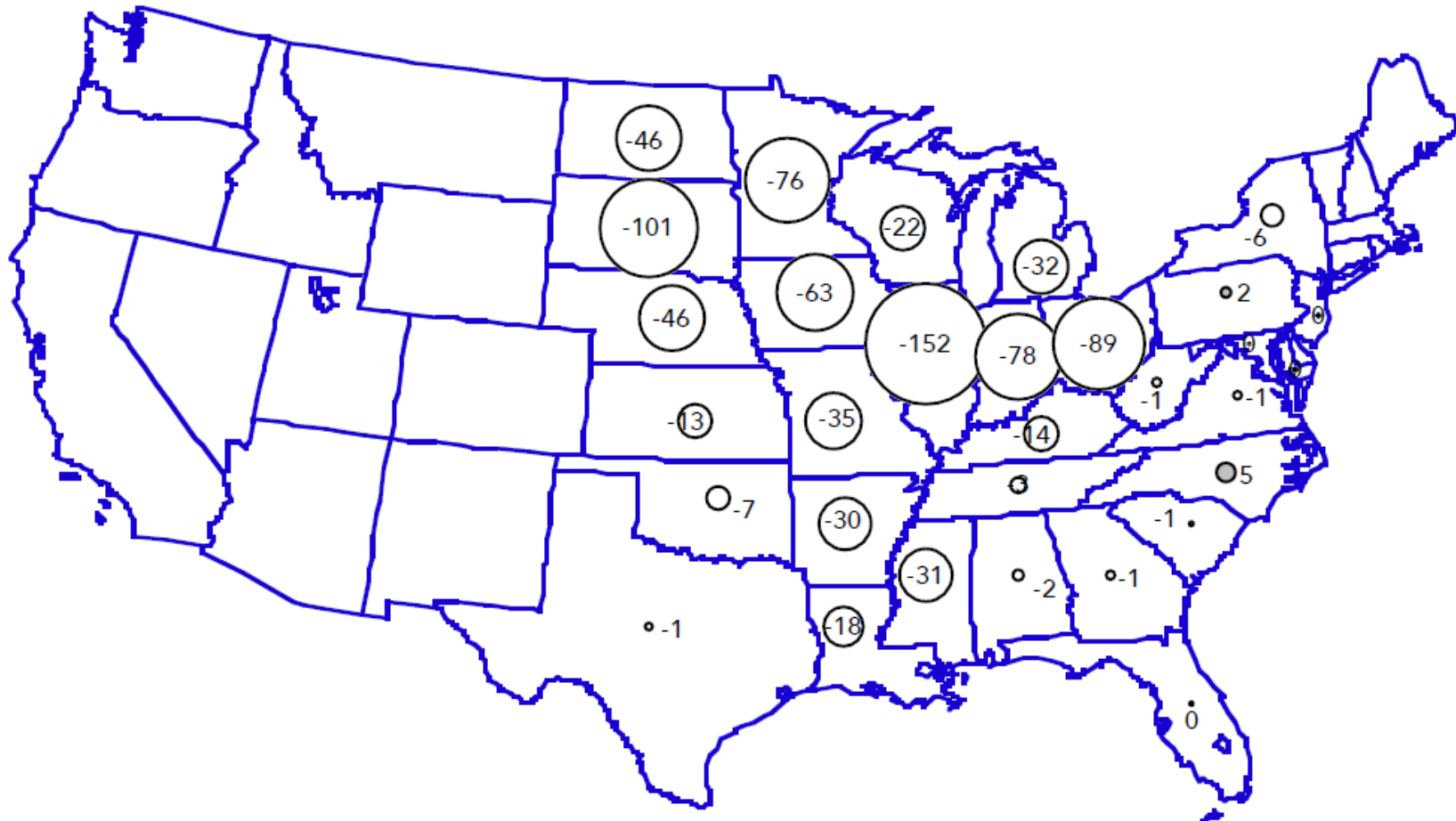
## Soybean Net Exports (+) and Net Imports (-), 19-20

Million Bushels

PRX\_Soybeans.xlsm, SDU, Aug-12-19



## Soybean Production Change, 19-20 vs. Previous Year





# Non – Traditional Grain Flows

- West to East corn flow
- Train Sizes
- RR Equipment vs Private Equipment



# GATX



NATIONAL GRAIN CAR COUNCIL MEETING | SEPTEMBER 12, 2019



# TODAY'S AGENDA

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- GATX Overview
- North American Railcar Market
- Railcar Market Insights
- Grain Car Outlook



# FORWARD-LOOKING STATEMENTS

Statements in this Presentation not based on historical facts are “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995 and, accordingly, involve known and unknown risks and uncertainties that are difficult to predict and could cause our actual results, performance, or achievements to differ materially from those discussed. These include statements as to our future expectations, beliefs, plans, strategies, objectives, events, conditions, financial performance, prospects, or future events. In some cases, forward-looking statements can be identified by the use of words such as “may,” “could,” “expect,” “intend,” “plan,” “seek,” “anticipate,” “believe,” “estimate,” “predict,” “potential,” “outlook,” “continue,” “likely,” “will,” “would”, and similar words and phrases. Forward-looking statements are necessarily based on estimates and assumptions that, while considered reasonable by us and our management, are inherently uncertain. Accordingly, you should not place undue reliance on forward-looking statements, which speak only as of the date they are made, and are not guarantees of future performance. We do not undertake any obligation to publicly update or revise these forward-looking statements. The following factors, in addition to those discussed in our other filings with the SEC, including our Form 10-K for the year ended December 31, 2018 and subsequent reports on Form 10-Q, could cause actual results to differ materially from our current expectations expressed in forward-looking statements:

- exposure to damages, fines, criminal and civil penalties, and reputational harm arising from a negative outcome in litigation, including claims arising from an accident involving our railcars
- inability to maintain our assets on lease at satisfactory rates due to oversupply of railcars in the market or other changes in supply and demand
- a significant decline in customer demand for our railcars or other assets or services, including as a result of:
  - weak macroeconomic conditions
  - weak market conditions in our customers' businesses
  - declines in harvest or production volumes
  - adverse changes in the price of, or demand for, commodities
  - changes in railroad operations or efficiency
  - changes in supply chains
  - availability of pipelines, trucks, and other alternative modes of transportation
  - other operational or commercial needs or decisions of our customers
- higher costs associated with increased railcar assignments following non-renewal of leases, customer defaults, and compliance maintenance programs or other maintenance initiatives
- events having an adverse impact on assets, customers, or regions where we have a concentrated investment exposure
- financial and operational risks associated with long-term railcar purchase commitments, including increased costs due to tariffs or trade disputes
- reduced opportunities to generate asset remarketing income
- operational and financial risks related to our affiliate investments, including the Rolls-Royce & Partners Finance joint ventures (collectively the “RRPF affiliates”)
- fluctuations in foreign exchange rates
- failure to successfully negotiate collective bargaining agreements with the unions representing a substantial portion of our employees
- asset impairment charges we may be required to recognize
- deterioration of conditions in the capital markets, reductions in our credit ratings, or increases in our financing costs
- Uncertainty relating to the LIBOR calculation process and potential phasing out of LIBOR after 2021
- competitive factors in our primary markets, including competitors with a significantly lower cost of capital than GATX
- risks related to our international operations and expansion into new geographic markets, including the imposition of new or additional tariffs, quotas, or trade barriers
- changes in, or failure to comply with, laws, rules, and regulations
- inability to obtain cost-effective insurance
- environmental remediation costs
- inadequate allowances to cover credit losses in our portfolio
- inability to maintain and secure our information technology infrastructure from cybersecurity threats and related disruption of our business

# GATX OVERVIEW





# GATX'S 121-YEAR HISTORY

**1898**

Established as railcar lessor with 28 railcars

**1919**

Initiated quarterly dividend

**1936**

Began rail investment in Canada

**1973**

Acquired American Steamship Company (ASC)

**1985**

Began locomotive investment

**1994**

Began rail investment in Europe & Mexico

**1998**

Formed Rolls-Royce Partners and Finance (RRPF) Affiliates

**2012 & 2013**

Began rail investments in India and Russia

**2019**

\$8.0 billion\* in assets and approximately 148,000 wholly owned railcars worldwide



\*Assets on- and off-balance sheet as of 12/31/2018



# GATX TODAY – BUSINESS SEGMENTS



## RAIL NORTH AMERICA

- Premier railcar lessor
- Diversified fleet of approximately 122,000 wholly owned railcars and more than 650 locomotives
- Strong customer credit quality, diversification in car types and commodities carried
- Over \$2.9 billion in committed lease receipts



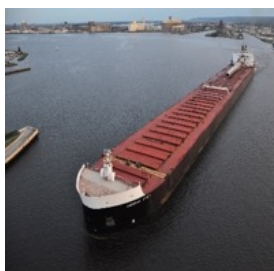
## RAIL INTERNATIONAL

- GATX Rail Europe (GRE) is a leading European tank car lessor with over 23,000 railcars
- Strong customer credit quality, diversification in car types, geography and commodities carried
- Largest railcar lessor in India



## PORTFOLIO MANAGEMENT

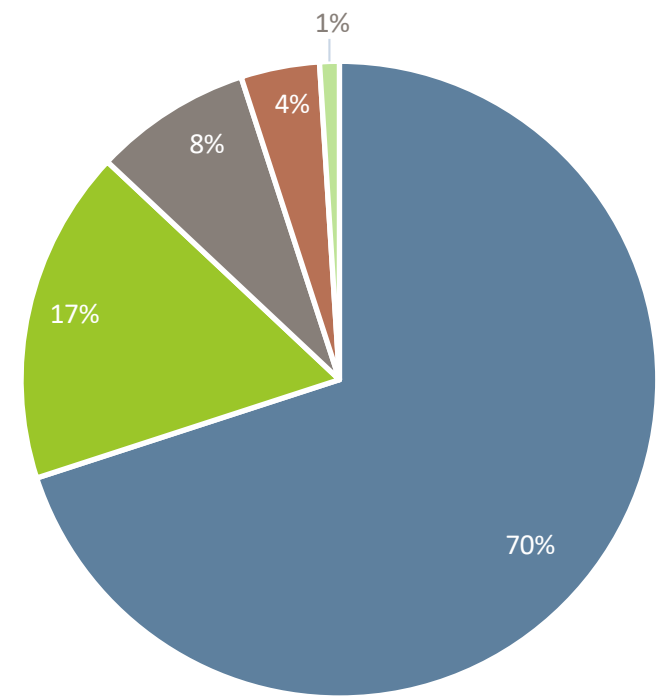
- RRPf is the largest lessor of Rolls-Royce aircraft spare engines worldwide
- \$4.4 billion of operating assets in the RRPf affiliates
- Over \$2.9 billion of committed lease receipts at the RRPf affiliates



## AMERICAN STEAMSHIP COMPANY

- Largest US-flagged vessel operator on the Great Lakes
- Operates a fleet of efficient self-unloading ships
- Exceptional safety record and leader in Great Lakes environmental matters

NET BOOK VALUE OF ASSETS



\$8.0 billion NBV\*

- 70% Rail North America
- 17% Rail International
- 8% Portfolio Management
- 4% ASC
- 1% Other

\*Assets on- and off-balance sheet as of 12/31/2018

As of 12/31/2018

# BUSINESS MODEL: SERVICE

*GATX has built a strong market position by focusing on full-service leasing in North America and Europe.*



## MAINTENANCE

- Customers rely on GATX to manage the complex process of maintaining railcars
- Extensive maintenance network: more than 20 maintenance locations in North America and Europe
- In 2018, GATX performed an aggregate of approximately 60,000 maintenance events in its owned and third-party maintenance network in North America and Europe



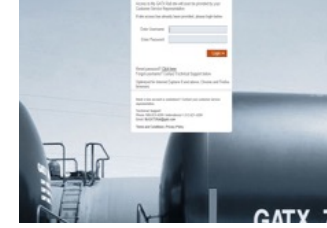
## ENGINEERING

- GATX's engineering team consists of mechanical, structural, and chemical engineers
- GATX's engineers tailor railcar solutions to meet customers' needs, taking into consideration commodity carried, location, and layout of facilities
- Develop railcar modification programs



## TRAINING

- GATX provides important training to customers and first responders
- GATX offers training at its headquarters, at customer sites, and through its TankTrainer™ mobile classroom



## TECHNOLOGY

- MyGATXRail.com provides real-time fleet management capability and maintenance data to customers
- Shop Portal provides GATX personnel with state-of-the-art technology for car inspection, maintenance instructions and reporting in real-time from the shop floor



## REGULATORY

- As a full-service railcar lessor, GATX takes an active leadership role in the complex regulatory landscape
- GATX leads several industry groups and agencies in North America and Europe

# GATX RAIL NORTH AMERICA OVERVIEW

## 2018 OVERVIEW

### WHOLLY OWNED FLEET COUNT

122,000

### CAR TYPE COUNT

160+

### AVERAGE FLEET AGE

20 Years

### LOCOMOTIVE COUNT

650+

### NUMBER OF CUSTOMERS

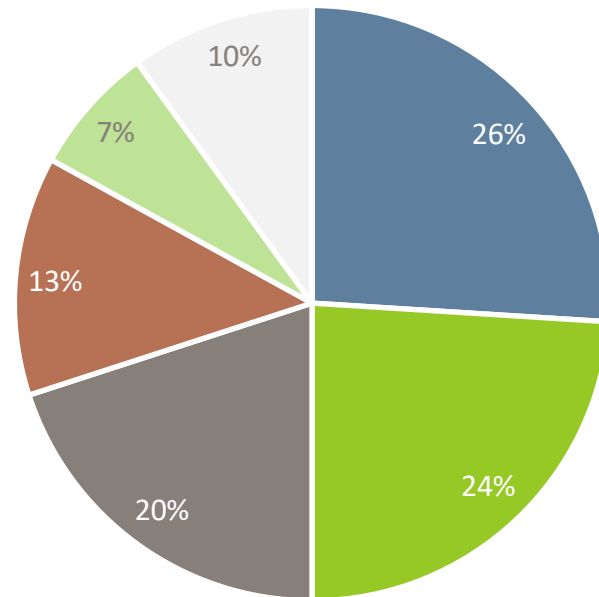
850+

### COUNTRIES OF OPERATIONS

US, Canada, & Mexico



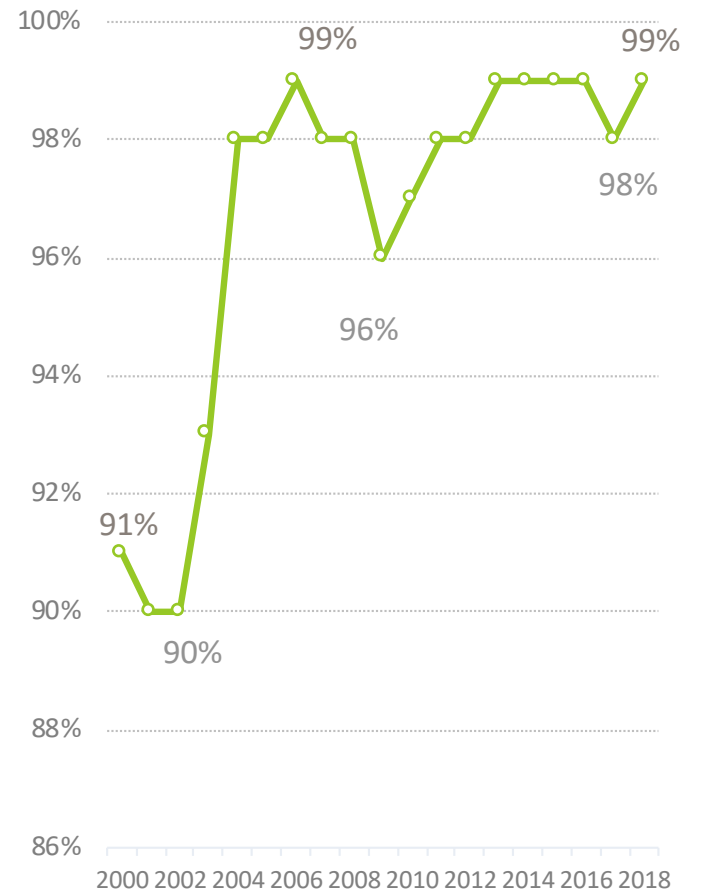
### INDUSTRIES SERVED



- 26% Chemicals
- 24% Refiners & Other Petroleum
- 13% Food & Agriculture
- 20% Railroads & Other Transports
- 7% Mining, Minerals & Aggregates
- 10% Other

Based on 2018 Rail North America Revenue

### UTILIZATION\*



\*Excludes boxcar fleet

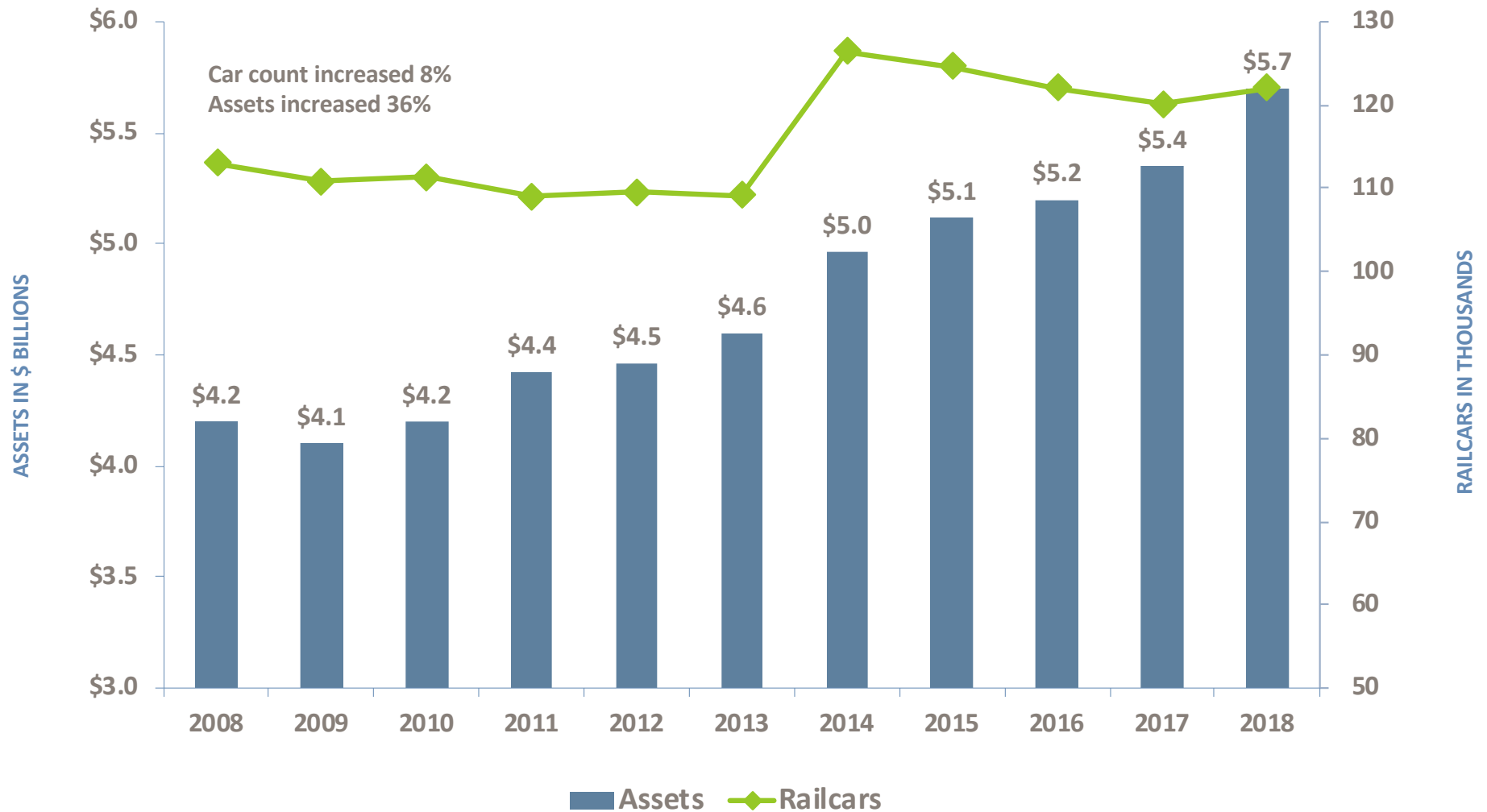
As of 12/31/2018

# GATX RAIL NORTH AMERICA: DIVERSE FLEET

	<b>CAR TYPE</b>	<b>COMMODITIES CARRIED</b>	<b>% OF FLEET</b>	<b>% OF NBV</b>
TANK CARS	General Service Tank Cars: 20k-25k gallon	Liquid fertilizers, Fuel oils, Asphalt, Food-grade oils, Chemicals (styrene, glycols, etc.)	15.1%	14.0%
	General Service Tank Cars: >25k gallon	Ethanol & methanol, Food-grade oils, Lubricating oils, Light chemicals, Light petroleum products (crude oil, fuel oils, diesels, gasoline, etc.)	14.3%	19.9%
	High-Pressure Tank Cars	LPG, VCM, Propylene, Carbon dioxide	10.0%	12.1%
	General Service Tank Cars: 13k-19k gallon	Molten sulfur, Clay slurry, Caustic soda, Corn syrup	5.2%	4.6%
	Other Specialty Tank Cars	Acids (sulfuric, hydrochloric, phosphoric, acetic, nitric, etc.), Coal tar pitch, Specialty Chemicals	5.1%	4.8%
	<b>Total Tank</b>		<b>49.7%</b>	<b>55.3%</b>
FREIGHT CARS	Boxcars	Paper products, Lumber, Canned goods, Food and beverages	13.3%	6.2%
	Open-top Cars	Aggregates, Coal, Coke, Woodchips, Scrap metal, Steel coils	7.3%	7.1%
	Gravity Covered Hoppers: >4k cubic feet	Grain, Sugar, Fertilizer, Potash, Lime, Soda ash, Bentonite	11.3%	11.9%
	Pneumatic Covered Hoppers	Plastic pellets	5.9%	3.6%
	Gravity Covered Hoppers: <4k cubic feet	Sand, Cement, Roofing granules, Fly ash, Dry chemicals	4.4%	4.9%
	Pressure Differential Covered Hoppers	Flour, Corn starch, Mineral powder, Lime, Clay, Cement	2.4%	2.2%
	Other	Flat cars (lumber and steel), Intermodal (containerized goods), Automotive (finished vehicles)	5.6%	8.9%
	<b>Total Freight</b>		<b>50.3%</b>	<b>44.7%</b>

As of 12/31/2018

# GATX RAIL NORTH AMERICA: CONTINUOUS INVESTMENT



\*Assets include on- and off-balance sheet



# GATX RAIL NORTH AMERICA: LOCOMOTIVE LEASING

**GATX OWNS, MANAGES  
OR HAS AN INTEREST  
IN MORE THAN 600  
LOCOMOTIVES**

**95% are four-axle  
locomotives leased to:**

- Regional and short-line railroads
- Industrial users
- Class I railroads





# FREIGHT BILL AUTOMATION

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**GATX made a \$1.5M investment in new software to help automate the Freight Billing Process**

Purpose: Systematize the process for receiving, auditing, paying, disputing and rebilling freight and switch invoices

Benefits :

- 1) Fewer invoicing/payment errors
- 2) Real-time feedback to the carrier on invoicing issues
- 3) Improved processing of invoices and payments

# FREIGHT BILL AUTOMATION

**GATX Freight Bill Audit**    Audit Review    Add Invoice    Reports    Admin    Car Number

Status: Pending Review    Vendor: UP    Audit Result: All    [Mark as Reviewed](#)

Vendor /SCAC	Invoice Number	Statement Date	Car Number	Car Count	Total Amount	Waybill Date	Origin	Destination	Route	Audit Result	Move Type	G/L Account	Dispute Reason	Dis Mes
UP	301156130	06/18/2019	GATX067421	1	7,101.15	04/05/2019	WARECO, GA	CITY OF IND...	CSXT-NEWOR...	Dispute	-	-	LESSEE'S AC...	N
UP	301163698	06/18/2019	GATX065377	1	1,647.00	06/05/2019	EAST ST LOU...	ANNAPOLIS, ...	ALS-ESTL-UP	Dispute	-	-	LESSEE'S AC...	N
UP	301156203	06/18/2019	GATX081092	1	2,745.52	04/26/2019	AKRON, OH	HEARNE, TX	WE-BELVU-NS...	Approve	5	106002	-	-
UP	301166046	06/18/2019	GATX067741	1	1,595.00	05/22/2019	OGDEN TFR, ...	HEARNE, TX	CPRS-SWTGR-...	Dispute	-	-	LESSEE'S AC...	N
UP	301156214	06/18/2019	GATX032845	1	1,819.00	04/26/2019	BUNNELL, FL	STONEHAM, TX	FEC-JACVL-C...	Dispute	-	-	LESSEE'S AC...	N
UP	301156208	06/18/2019	GATX081095	1	2,745.52	04/16/2019	TORONTO MAC...	HEARNE, TX	CN-ESTL-UP-...	Dispute	-	-	LESSEE'S AC...	N
UP	301156201	06/18/2019	GATX075241	1	2,220.98	05/10/2019	LYNNDYL, UT	WEST COLTON...	UP-WCOLT-SH...	Dispute	-	-	LESSEE'S AC...	N
UP	301156152	06/18/2019	GATX057427	1	1,820.00	05/28/2019	STONEHAM, TX	BASTROP, LA	UP-MONRO-ALM	Dispute	-	-	LESSEE'S AC...	N
UP	301156213	06/18/2019	GATX095818	1	2,515.98	05/10/2019	LYNNDYL, UT	WEST COLTON...	UP-WCOLT-SH...	Dispute	-	-	LESSEE'S AC...	N

Automated list of Freight Bills pending review\*

Freight Bill details for review and approval/dispute\*

**GATX Freight Bill Audit**    Audit Review    Add Invoice    Reports    Admin    Car Number    fbats1

← Invoice no. 301156130    Pending Review    System Audit    EDI    [Mark as Reviewed](#)

Invoice		Account Number		STCC	
Vendor	UP	Account Number	013094	STCC	3742217
Lead Car Number	GATX067421	Total Amount	7,101.15 USD	Billing Due Date	07/03/2019
Statement Date	06/18/2019	Waybill Date	04/05/2019	Waybill Number	67421
Shipper	GATX LOGISTICS INC	Consignee	FLINT GROUP	Route	CSXT-NEWOR-UP
Revenue Origin	NEW ORLEANS, LA	Revenue Destination	CITY OF INDUSTRY, CA		
Movement Origin	WARECO, GA	Movement Destination	CITY OF INDUSTRY, CA		
<a href="#">View All Cars (1)</a>					
Audit					
Audit Result	Dispute	Lessee Sold To	0000016961	SAP Legal Asset Owner 2000 - GATX Corporation USA	
Dispute Reason	LESSEE'S ACCOUNT	Dispute Message	Not for GATX's account. Move to lessee's account: 0000016961 FLINT CPS INKS NORTH AMERICA L		
Comment					

\*Note: Pictured data is for test purposes, it is not live data



# NORTH AMERICAN RAILCAR MARKET



# NORTH AMERICA – INDUSTRY RAILCAR OWNERSHIP

Approximately 1.6 million railcars

## RAILROADS (18%)

- Ownership of railcars has been declining
- Virtually no tank car ownership due to complexities and regulations
- Focus of capital investment on infrastructure

## LESSORS (54%)

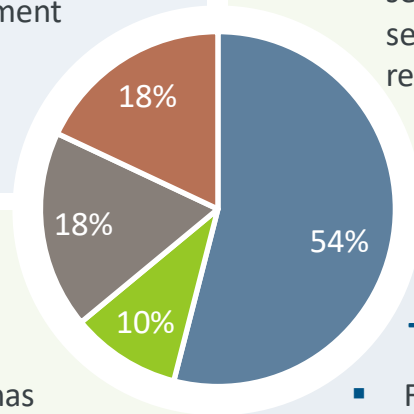
- Shift from railroad- and shipper-owned railcars to lessor market share
- Lessors dominate the tank car segment due to complex services and compliance requirements

## SHIPPERS (18%)

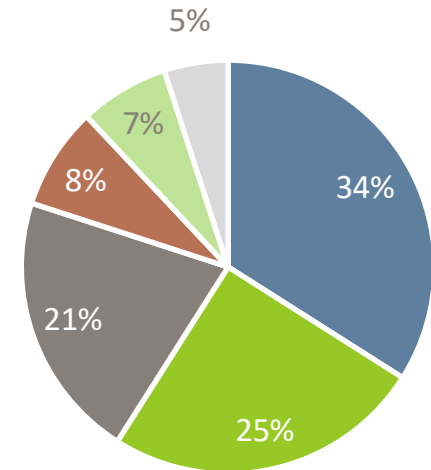
- Shipper market share has been relatively constant since 2008 at ~18%
- Alternative focus of capital on core business versus railcar investments

## TTX (10%)

- Fleet is predominantly focused on intermodal, flat cars, and boxcars
- Overall market share has remained steady since 2008 at ~10% of the North American fleet



NORTH AMERICAN FLEET BY CAR TYPE



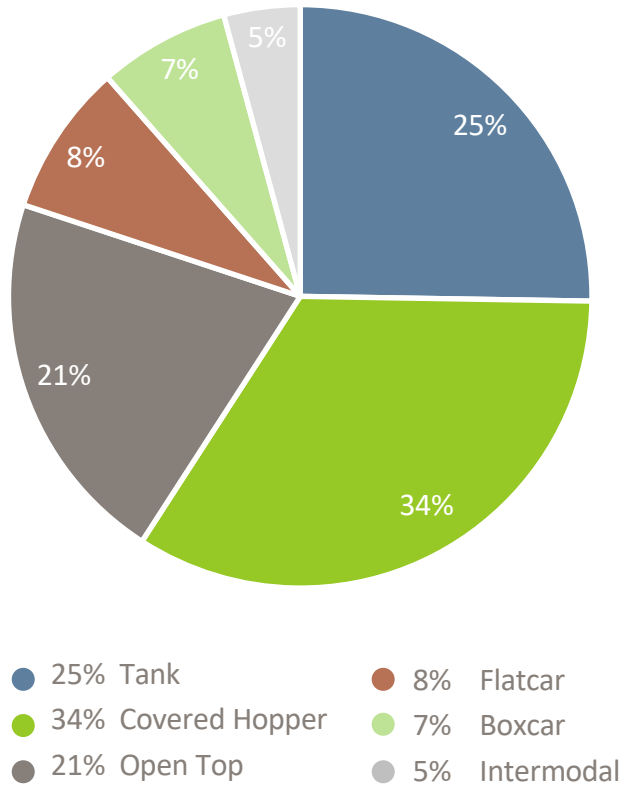
- 34% Covered Hopper
- 25% Tank
- 21% Open Top
- 8% Flat
- 7% Boxcar
- 5% Intermodal

Approximately 1.6 million railcars

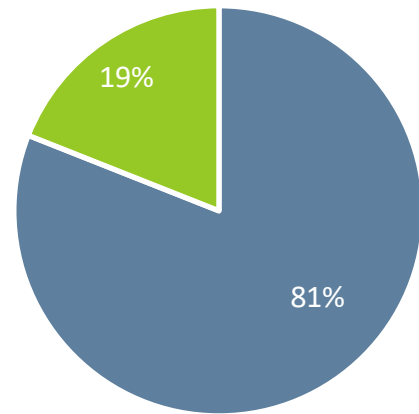
# NORTH AMERICA – TANK & FREIGHT INDUSTRY OWNERSHIP

RAILCARS BY TYPE

(Based on approximately 1.6 million railcars)



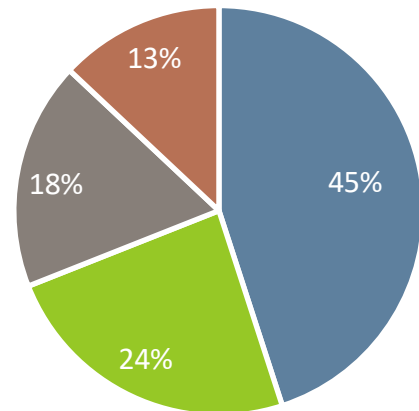
TANK CAR OWNERSHIP SHARE



- 81% Lessor
- 19% Shipper/Other
- <1% Railroad

Based on approximately 410,000 tank cars

FREIGHT CAR OWNERSHIP SHARE



- 45% Lessor
- 24% Railroad
- 18% Shipper/Other
- 13% TTX

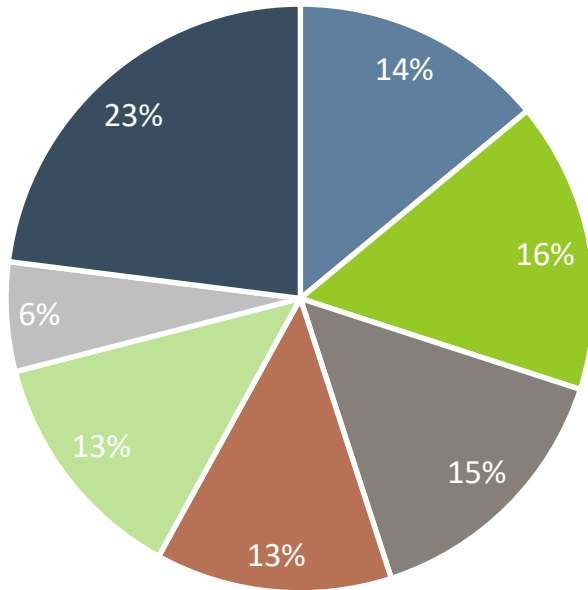
Based on approximately 1.2 million freight cars



# NORTH AMERICA – LESSOR MARKET SHARE

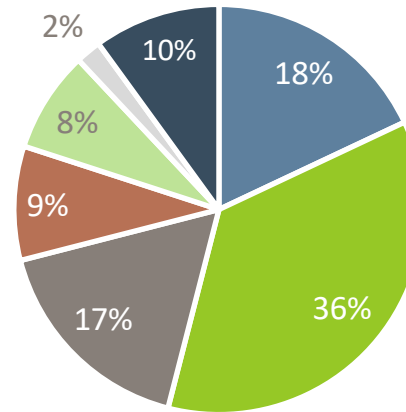
## LESSOR OWNERSHIP SHARE

(Based on approximately 876,000 lessor-owned railcars)



- 14% GATX
- 16% Wells Fargo Rail
- 15% Union Tank Car
- 13% CIT
- 13% Trinity
- 6% SMBC
- 23% Other

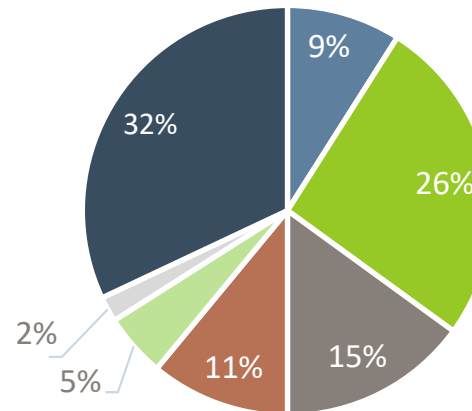
## TANK CAR LESSOR OWNERSHIP SHARE



- 18% GATX
- 36% Union Tank Car
- 17% Trinity
- 9% CIT
- 8% SMBC
- 2% Wells Fargo Rail
- 10% Other

Based on approximately 332,000 lessor-owned tank cars

## FREIGHT CAR LESSOR OWNERSHIP SHARE



- 9% GATX
- 26% Wells Fargo Rail
- 15% CIT
- 11% Trinity
- 5% SMBC
- 2% Union Tank Car
- 32% Other

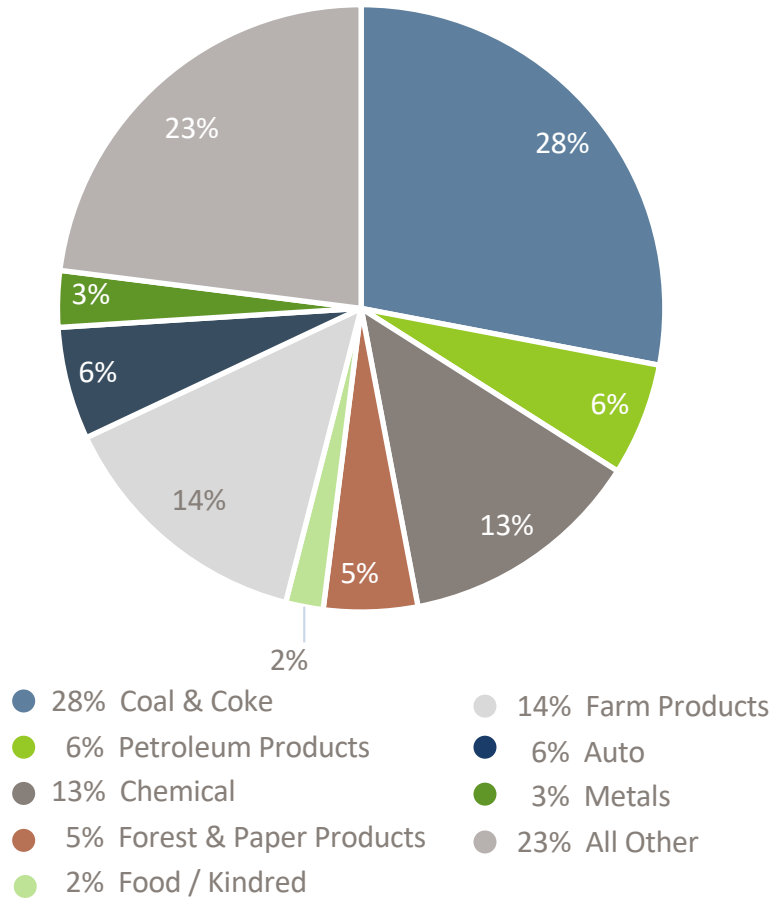
Based on approximately 528,000 lessor-owned freight cars



# NORTH AMERICA – INDUSTRY SHIPMENTS & CARLOADINGS

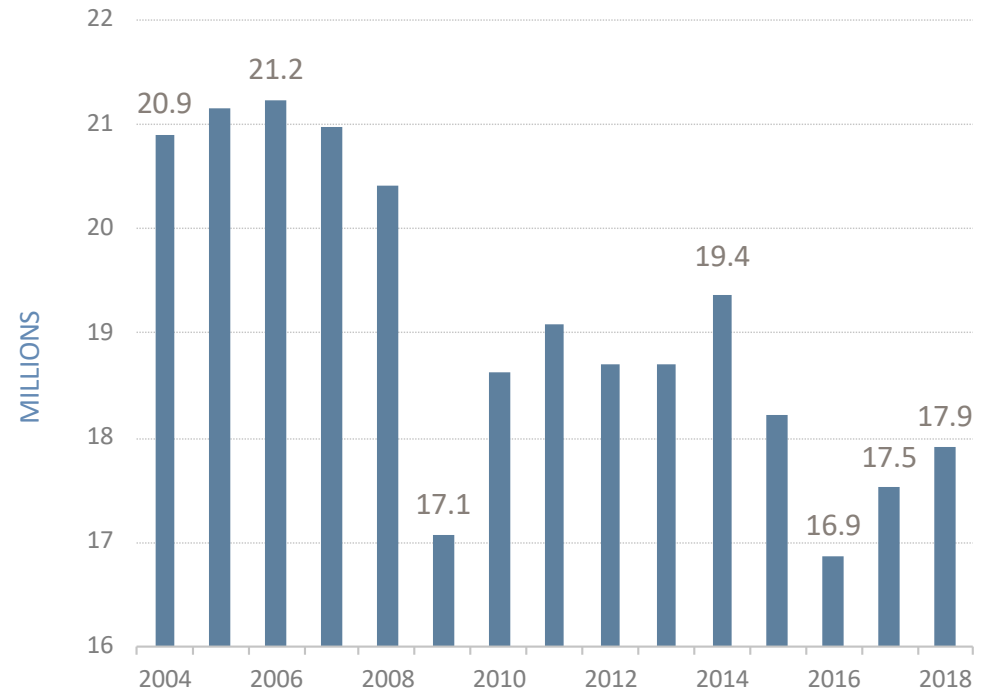
## INDUSTRY SHIPMENT COMPOSITION

(Based on 2018 carloads of approximately 17.9 million)



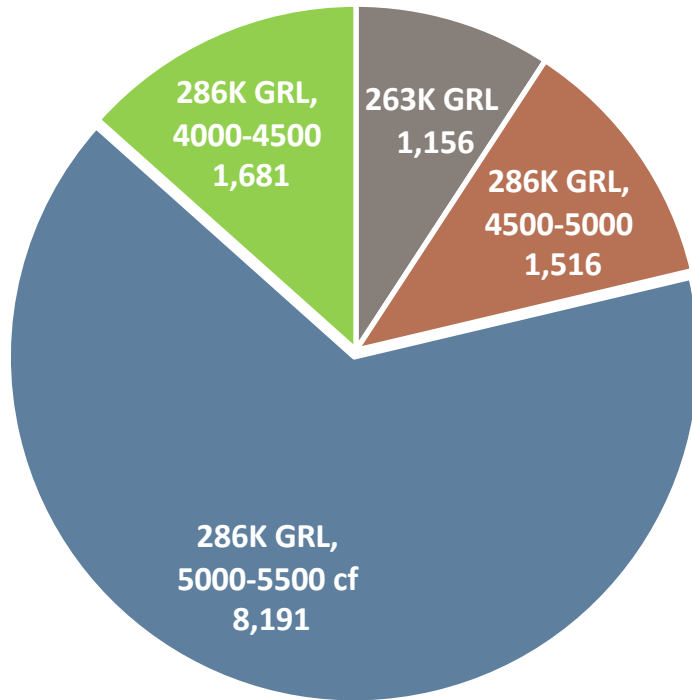
## CARLOADS ORIGINATED

(United States and Canada)



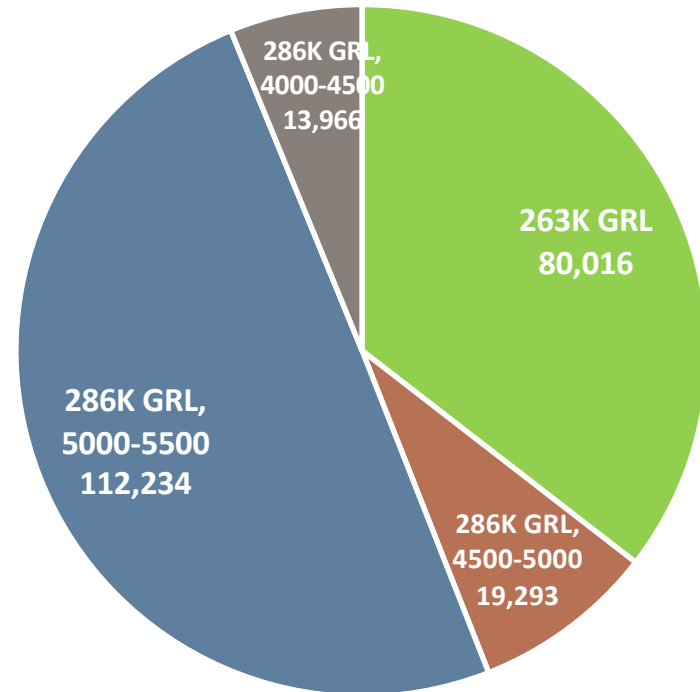
# MEDIUM-CUBE COVERED HOPPER FLEET BREAKDOWN

## 2019 GATX Fleet Breakdown



Total GATX Fleet:  
**12,544**

## 2019 N.A. Fleet Breakdown



Total N.A. Fleet:  
**225,509**

### Ownership Breakdown

- 50% Lessor (115k)
- 33% Railroad (74k)
- 17% Shipper (36.5k)

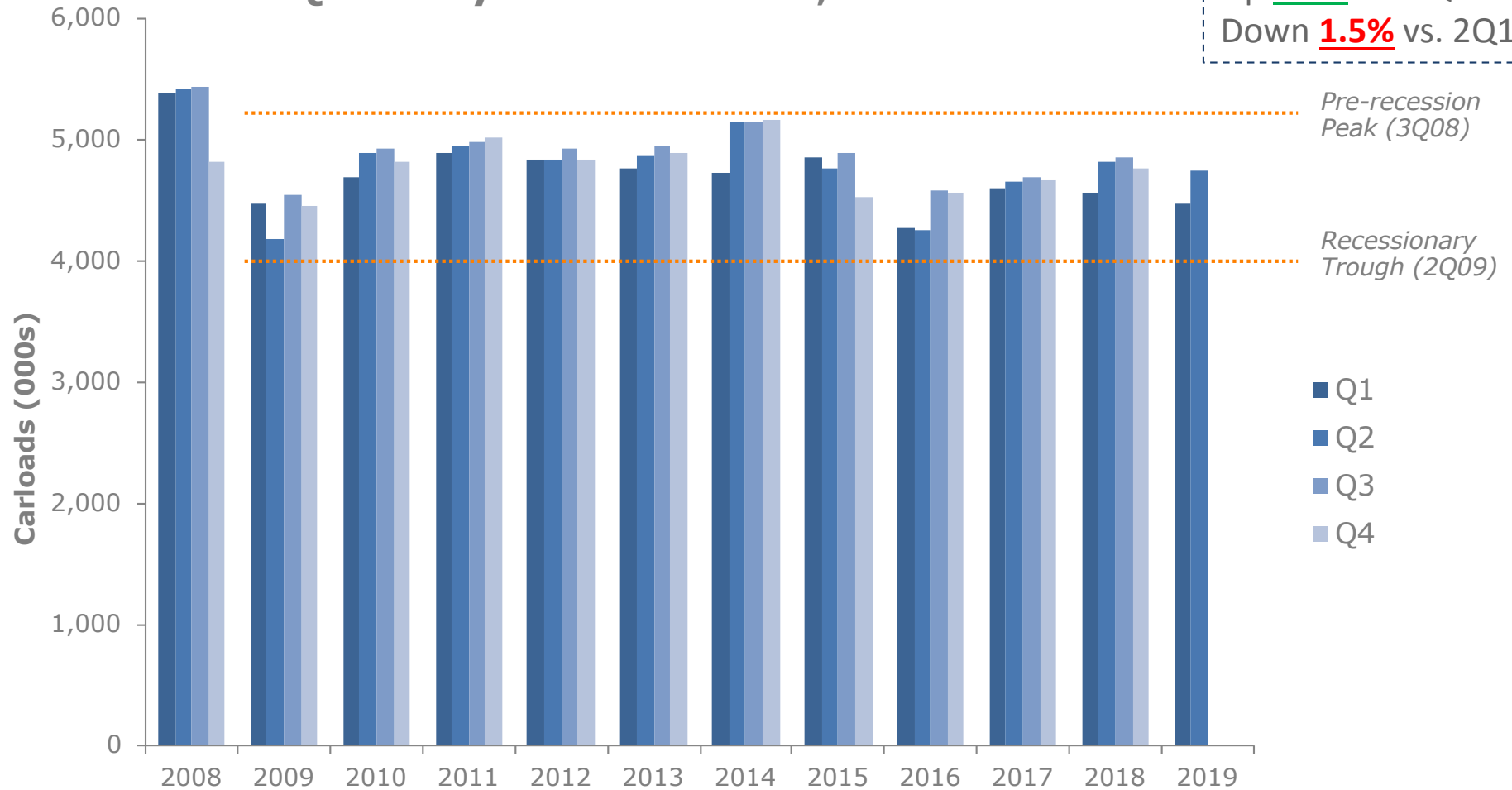
\*Note: Includes only gravity-discharge cars  
Source: Umler as of 1/2/2019

# RAILCAR MARKET INSIGHTS



# CAR LOADINGS

## Quarterly Carload Traffic, North America



Source: ARCI



# RAIL TRAFFIC

- Rail service improves in 2Q19
  - Velocity improved by +3.6% YoY and dwell times decreased by -10.7% YoY
  - Despite sustained flooding in 2Q19, velocity only fell slightly by -0.9% QoQ and dwell times improved markedly (-7.2% QoQ)
- 3Q19 rail service off to strong start
  - For 3Q thru August 28, velocity ticked down 0.3% QoQ and dwell times improved by 3.1% QoQ

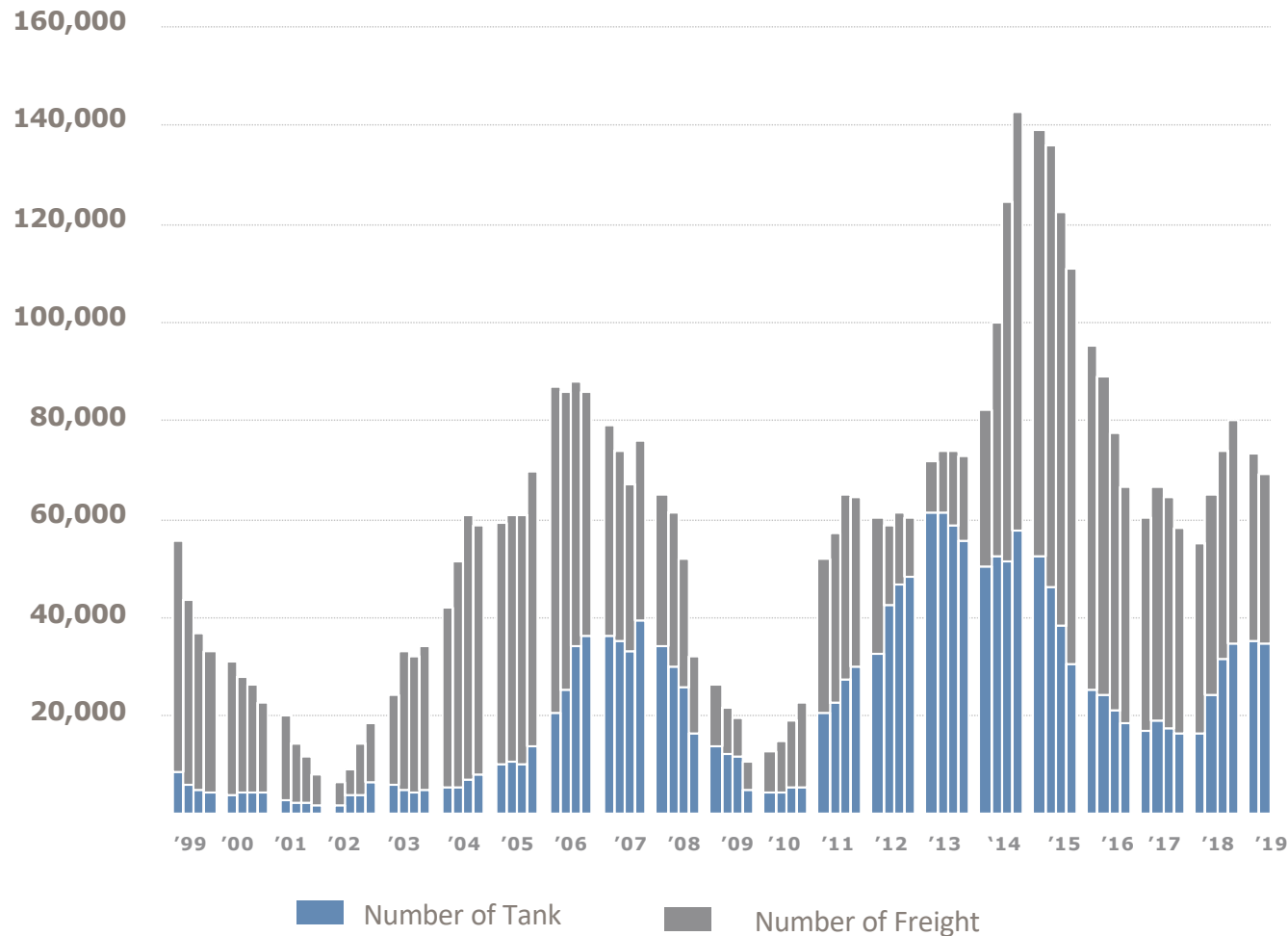
**Average Class I RR Velocity (mph)**



\*Note: STB data (under current methodology) only goes back to early 2017 and CN system data only covers US operations



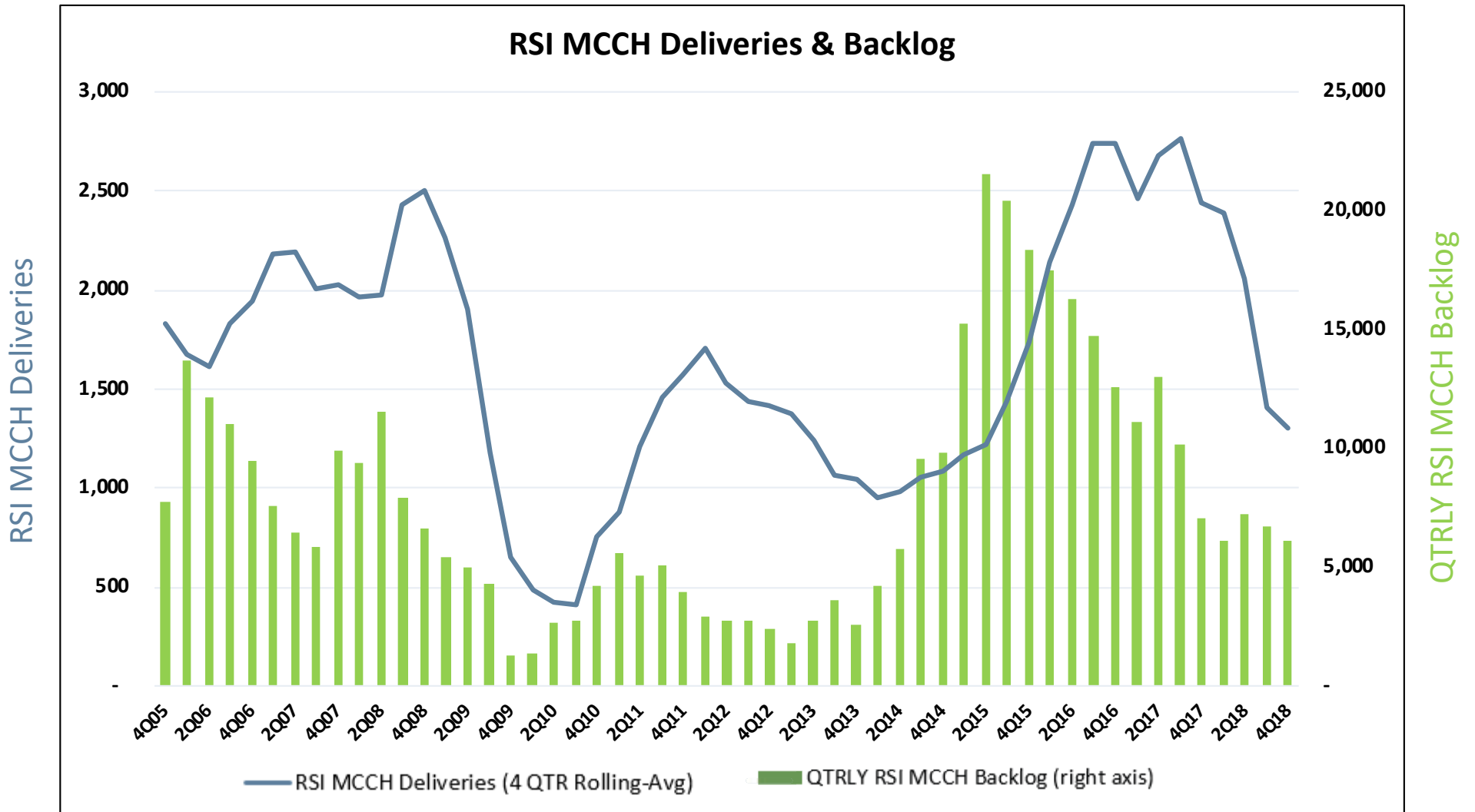
# NORTH AMERICA – NEW RAILCAR BACKLOG



- Cyclical nature of the industry is illustrated by the backlog of orders at the railcar manufacturers
- The 2013 and 2014 spike in tank car backlog was primarily due to the crude/fracking boom
- Backlogs have moderated post-crude boom but remain high relative to history and relative to carload demand

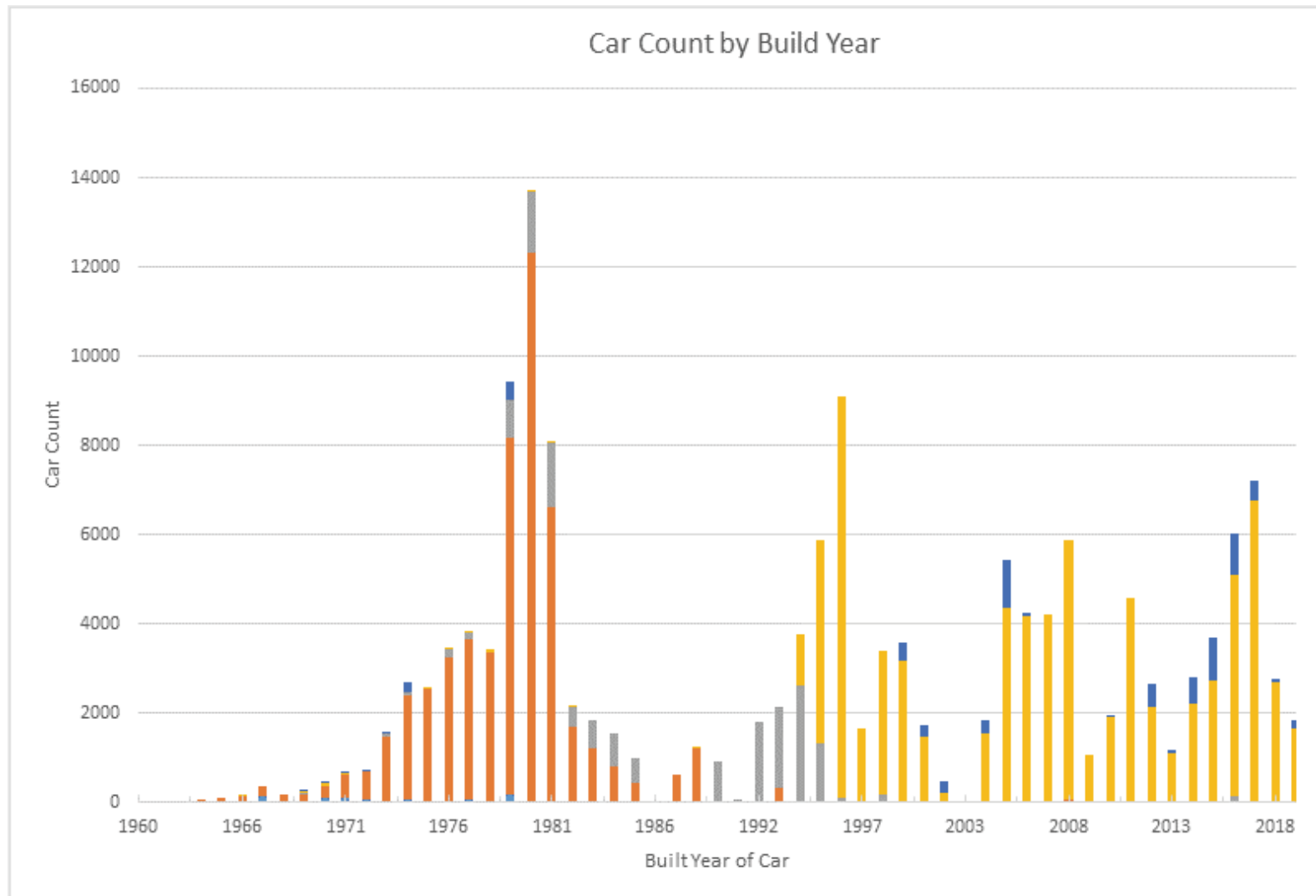
Source: Railway Supply Institute as of July 2019

# MEDIUM CUBE DELIVERY AND BACKLOG



Source: RSI

# MCCH CAR COUNT BY BUILD YEAR



Source: Umler

# RAILCAR ORDERS, DELIVERIES & BACKLOG

2Q19 vs. trailing four quarters

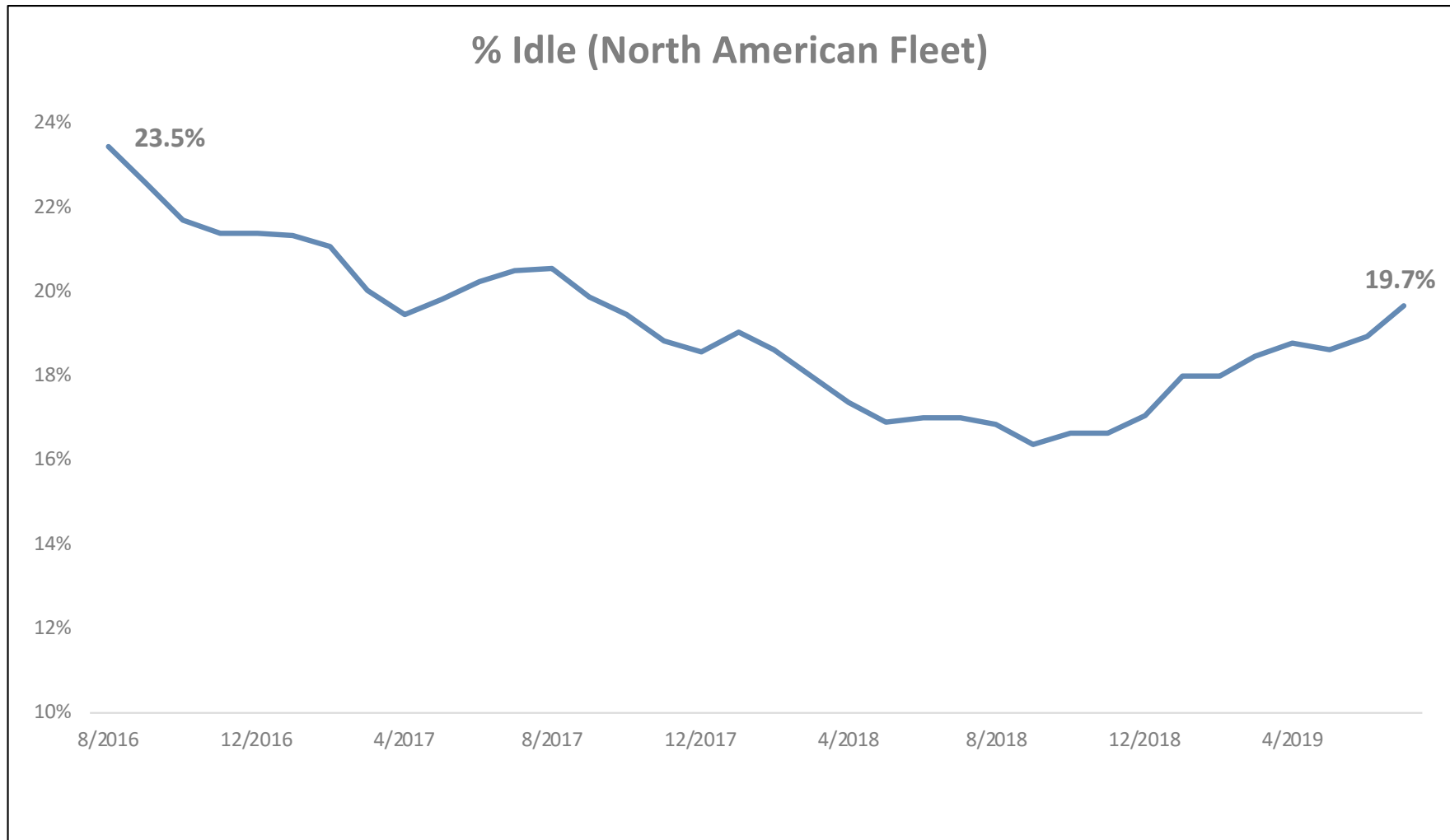
	7/1/2019	4/1/2019	12/31/2018	10/1/2018
Backlog	<b>69,227</b>	73,076	80,223	73,812

	2Q19	1Q19	4Q18	3Q18	2Q18
Orders	<b>11,754</b>	9,663	19,955	24,972	23,788
Deliveries	<b>15,623</b>	13,171	13,462	11,221	13,071

Source: ARCI

# IDLE FLEET METRIC

- ~15,400 more idle cars compared to 4/1/19



Source: AAR (Rail Time Indicators Report)



# GRAIN CAR OUTLOOK



# GATX VIEW ON GRAIN CAR MARKET OUTLOOK

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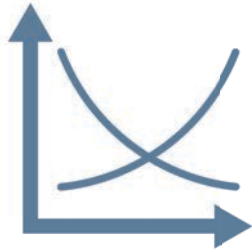
- Grain cars are “easy” to speculate on for new entrant lessors
- Most Railcar manufacturers build grain cars, driving speculative production
- Weather, tariffs, PSR, and cheap money have all contributed to oversupply
- Long-term rotation underway from 4750s to 5200 to modern “short” cars
- Specialized cars (sugar, carbon black, PTA) not generally subject to oversupply



# SUMMARY

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1



- **Car loadings** continue to decline
- **Velocity** rises year over year

2



- Tank Car volume has **remained steady**
- Freight Car new build demand **will struggle** due to existing car overhang

3



- Railcar manufacturing 'footprint' may be **too large** for near term cycle

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**QUESTIONS?**