



Boxcar 101



produced by The Greenbrier Companies

Agenda

- Overview of the Boxcar
- Boxcar: Fleet Size and Commodities
- Future Boxcars
- National Pooling
- The Short Line Dilemma
- Boxcar Improvements



Boxcars – Why Did They Make It So Hard?

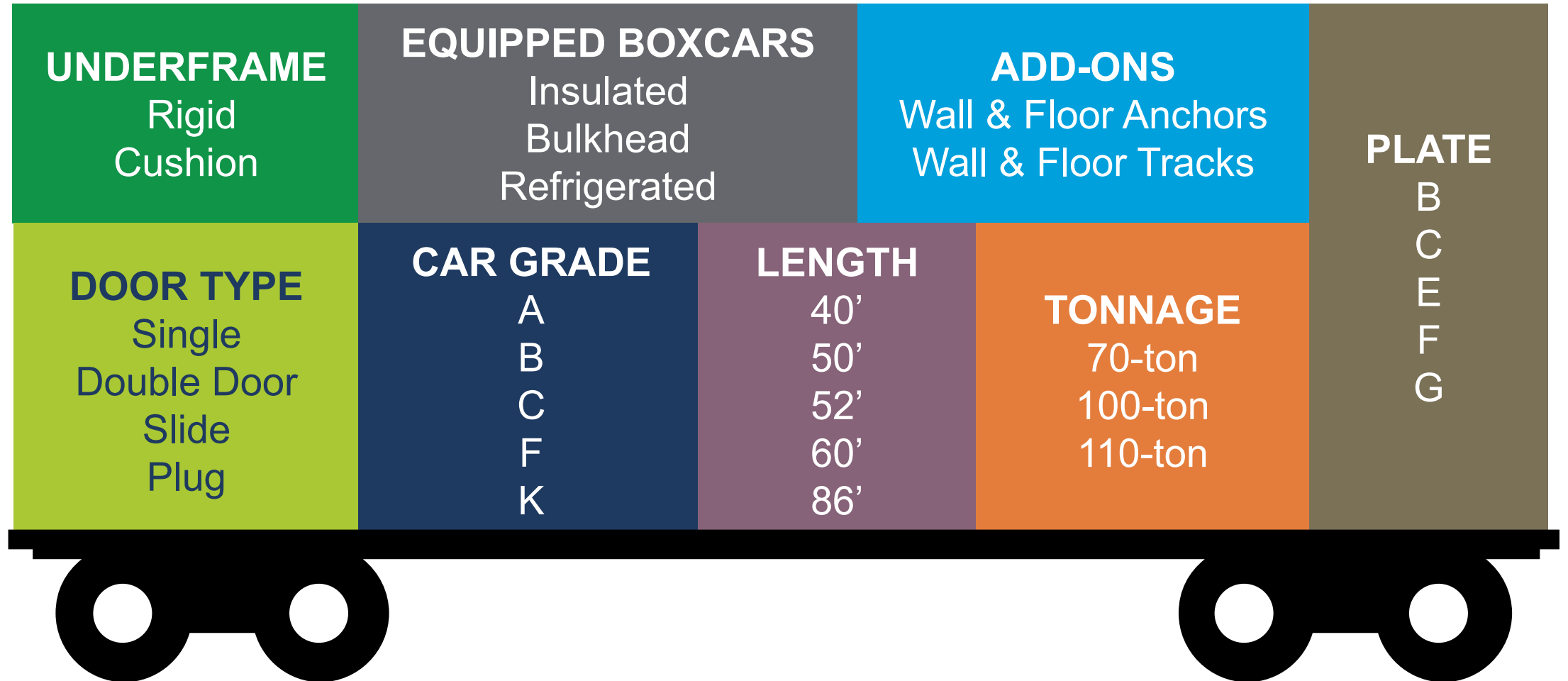


The Early History of the Boxcar

- 1930s – “Housecars”
- WWII – Troop Transport
- Originally built as a 40’ general purpose railcar
- First built as 40’ then in the 1960s as a 50’
- 1970s – severe shortage led to incentive per diem boxcars (grandfathered)
- 1980s – 86’ and 60’ boxcars were built



Boxcars Are Very Complex!



Grade & Plate Size Differences Effect What Can Be Loaded

Boxcar Grade

- A** “**Cadillac**” – Finished paper capable; best shape in the fleet
- B** “**Pontiac**” – Brown paper, pulp board, scrap paper, canned goods; decent shape
- C** “**Ford**” – Used for bricks, zinc, cement, fertilizer, etc.; worst shape of revenue cars
- Other** “**Datsun**” – Used for cotton seed, carcasses, etc.; non-revenue worthy

Plate Size

- B** ~ 14'2"
- C** ~ 13'9"
- E** ~ 15'9"
- F/G** ~ 17'0"

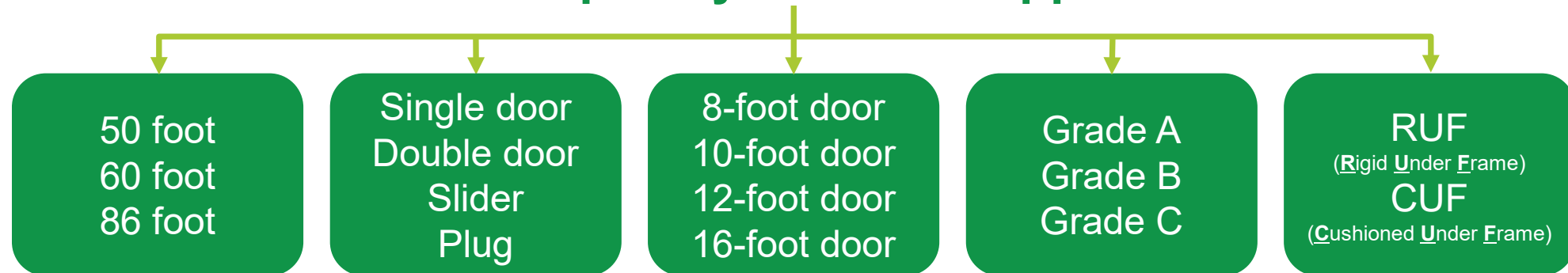
Attributes limit product loading

- Car grade limits what product can be loaded
- Certain roof height & edges more desirable
- Customers need certain car attributes to ship product

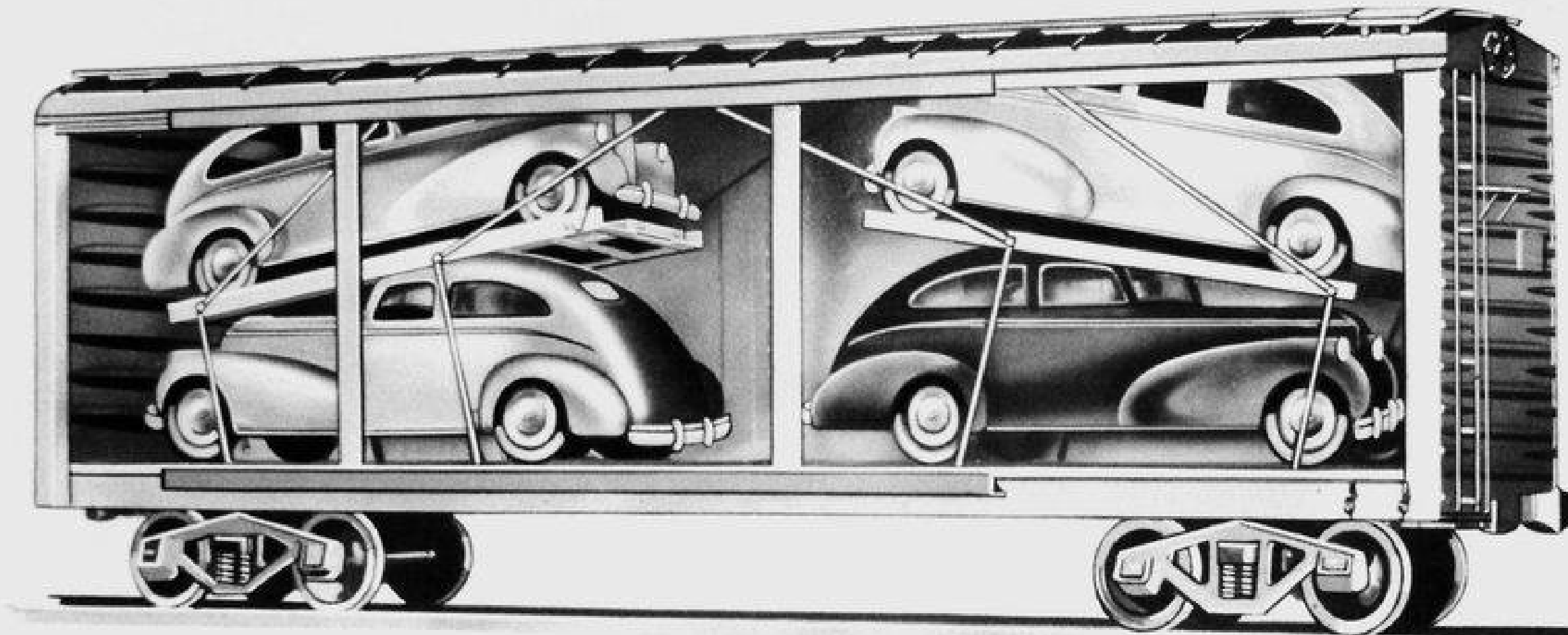
Similar Commodities Carried in Dissimilar Boxcars

1. 50' RBL Box (102) – Canned goods, alcohol, flour
2. 60' RBL Box (103) – Alcohol, canned goods, refrigerated product
3. 50' RUF Box (104) – Pulp board & wood pulp, scrap paper, alcohol
4. 50' CUF Box (105) – Pulp board, printing paper, wood pulp, alcohol
5. 60' Merch Box (107) – Appliances, panel products, newsprint
6. 60' Auto Box (106) – Auto parts
7. 86' Auto Box (108) – Auto parts
8. Refrigerated boxcar (109) – Tropicana

Boxcar complexity creates shipper issues



Fleet Size and Commodities Handled

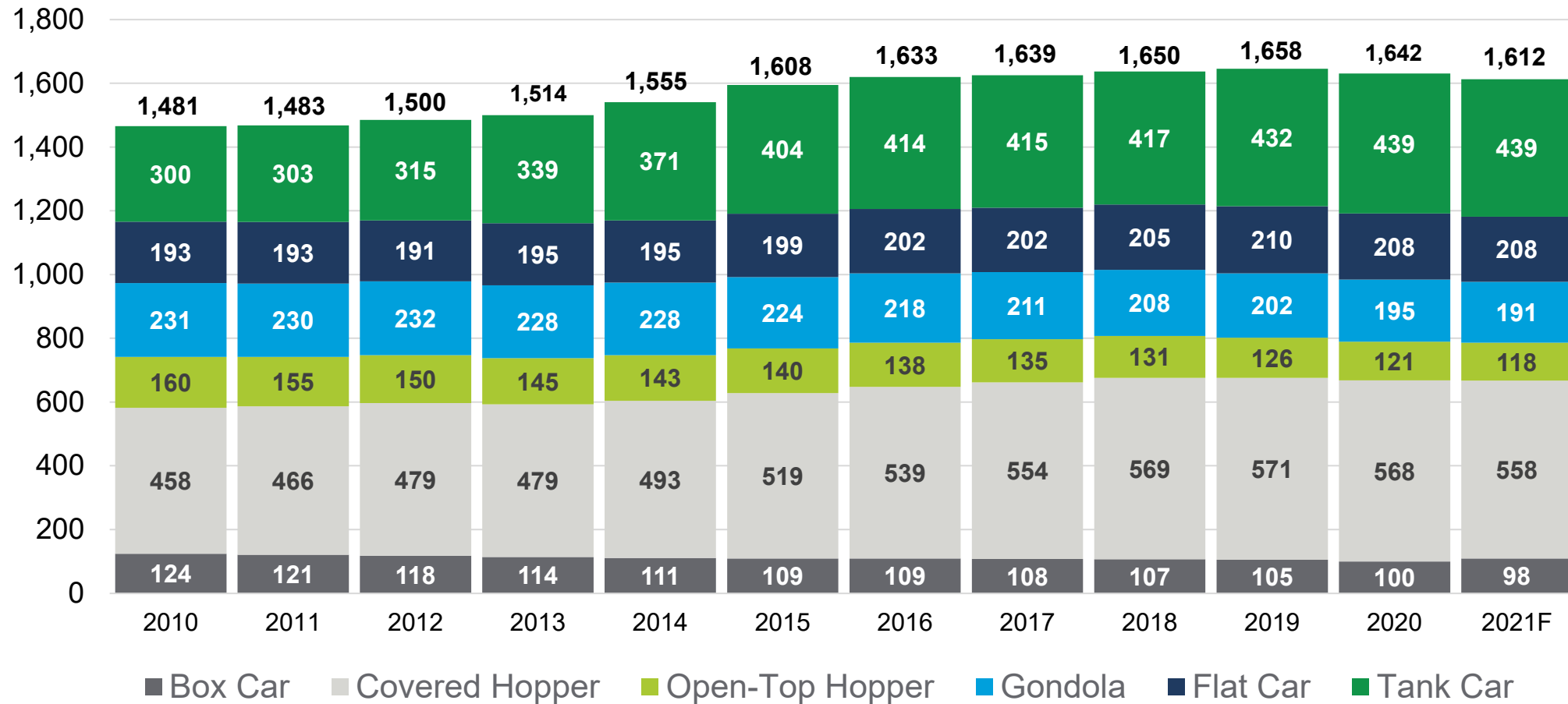


North American Railcar Fleet*

(counts at Year End/YTD, shown in thousands)



Total Railcar Fleet



*Active Equipment Registered in UMLER

^Double-Stack counts shown in Platforms

Railcar Fleet* Average Age



- Relatively steady since 2009 (implementation of the new UMLER)
- 2020 average age: 19.6 year
 - Average boxcar age = 28.6 years
- Stability indicates that new railcars are added to the fleet at roughly the same rate that others exit
- Increased Life Service (ILS): extending the life of a railcar from 50–65 years; always an option for railcars and has been used in many other fleets

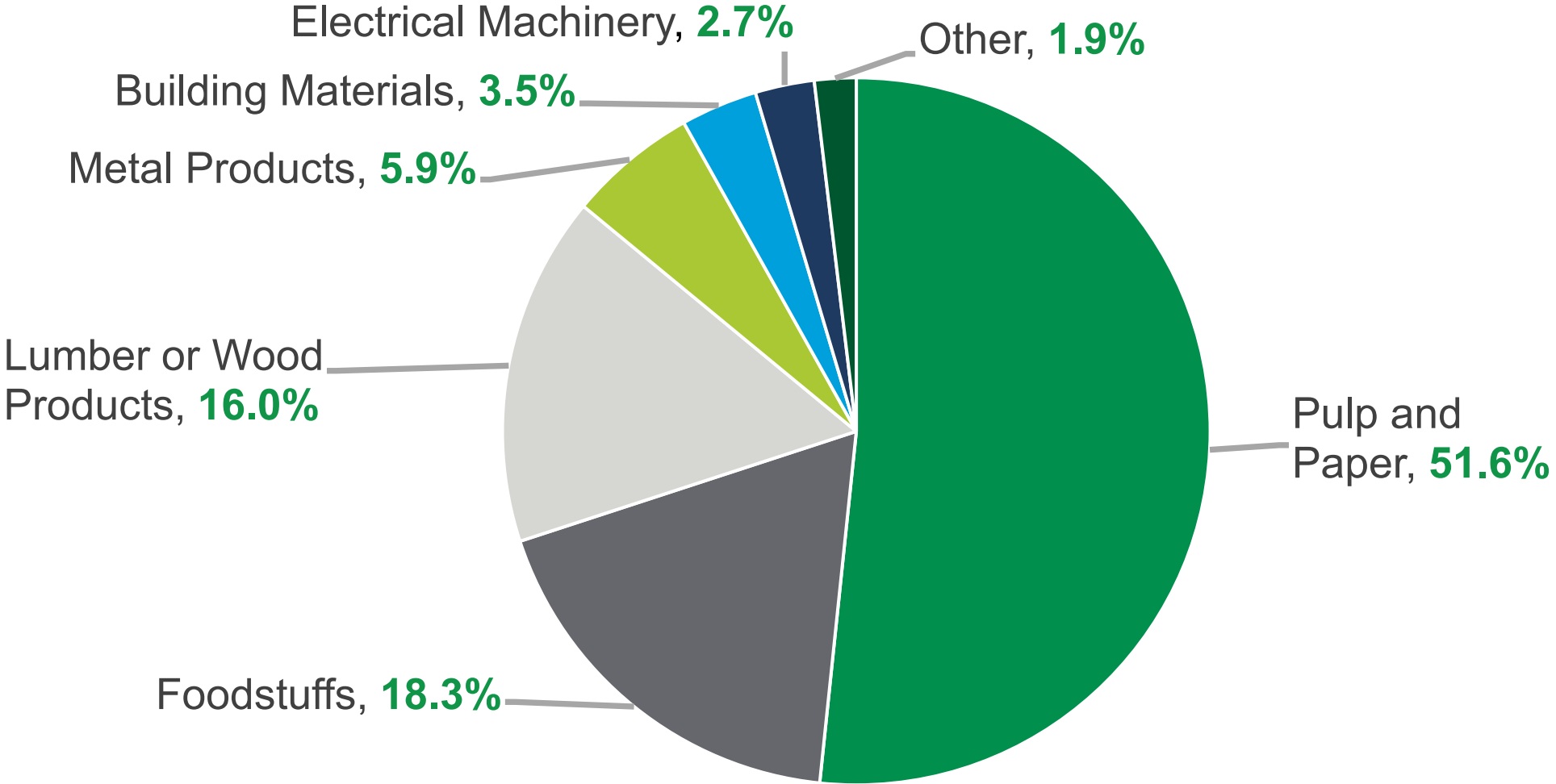
*Revenue-earning fleet

Boxcar Fleet* Size

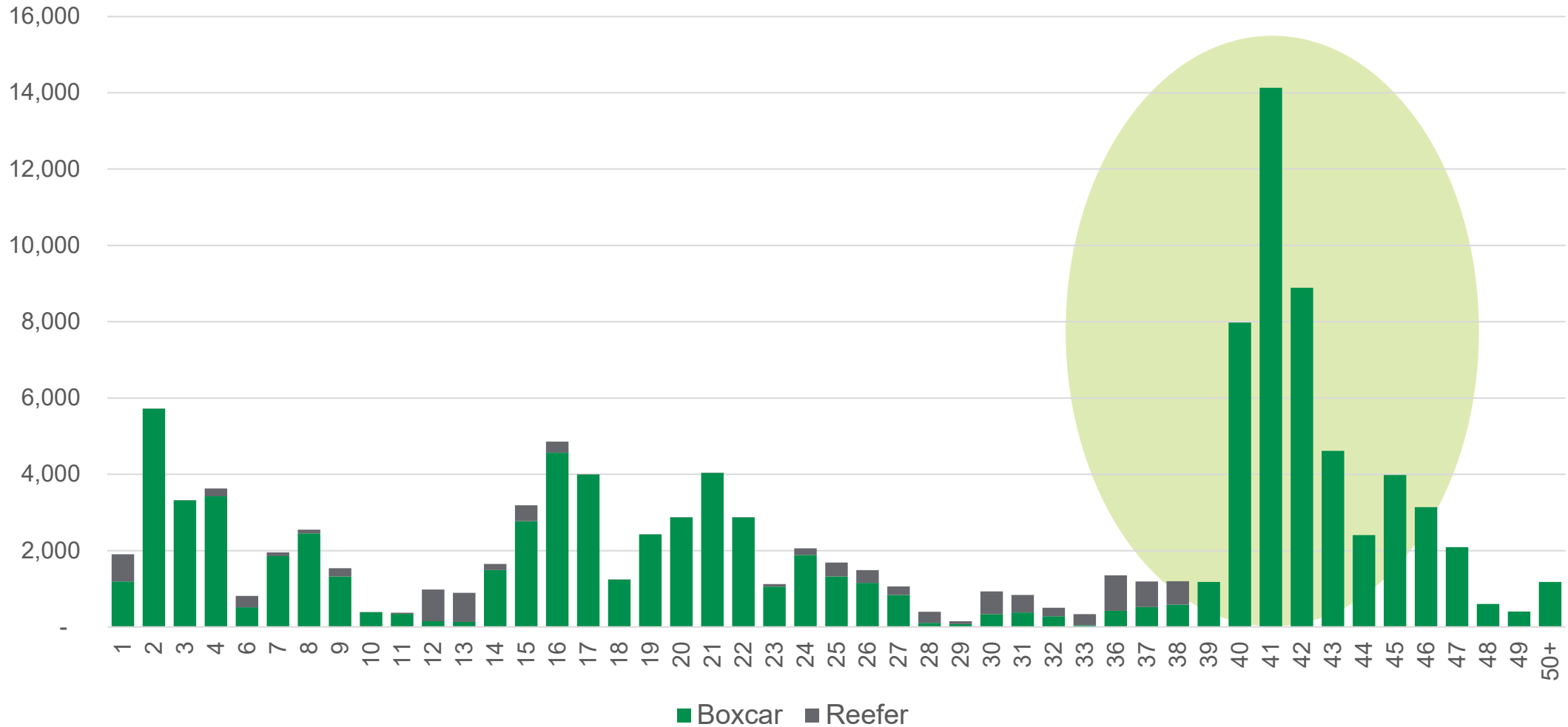


- 108,881 active boxcars
 - High-cube (Plate F, 286k GRL): 42,486 on 91% utilization
 - Standard-cube (Plate C, <286k GRL): 56,770 on 89% utilization
 - Refrigerated boxcar: 9,625 on 74% utilization
- Handle a wide variety of products (e.g., paper, tissue, container board)
- Excellent pooling candidate, due to their flexibility
 - North American Boxcar Pools:
 - 50' 70-ton
 - 50' 100-ton Plate F
 - 60' 100-ton Plate F
 - ABOX/RBOX Pool – 50' 70-ton pool only available to TTX Member Roads

2018 Boxcar Loads by Commodity



Fleet* Age Demographics – The Cliff



Boxcar Fleet* Age Demographics – The Cliff



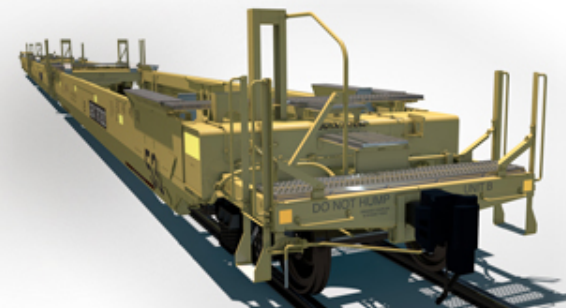
- Where are the largest concentrations of boxcars* that will fall out?
 - RBOX/ABOX – owned by TTX for use by their member roads; most are in storage
 - North American Boxcar Pool – used by the Class Is and scheduled to be replaced by higher capacity boxcars
 - Short lines – the mainstay boxcar is the 50' 70-ton boxcar
 - This is the biggest area of concern



Boxcar Fleet Age Demographics



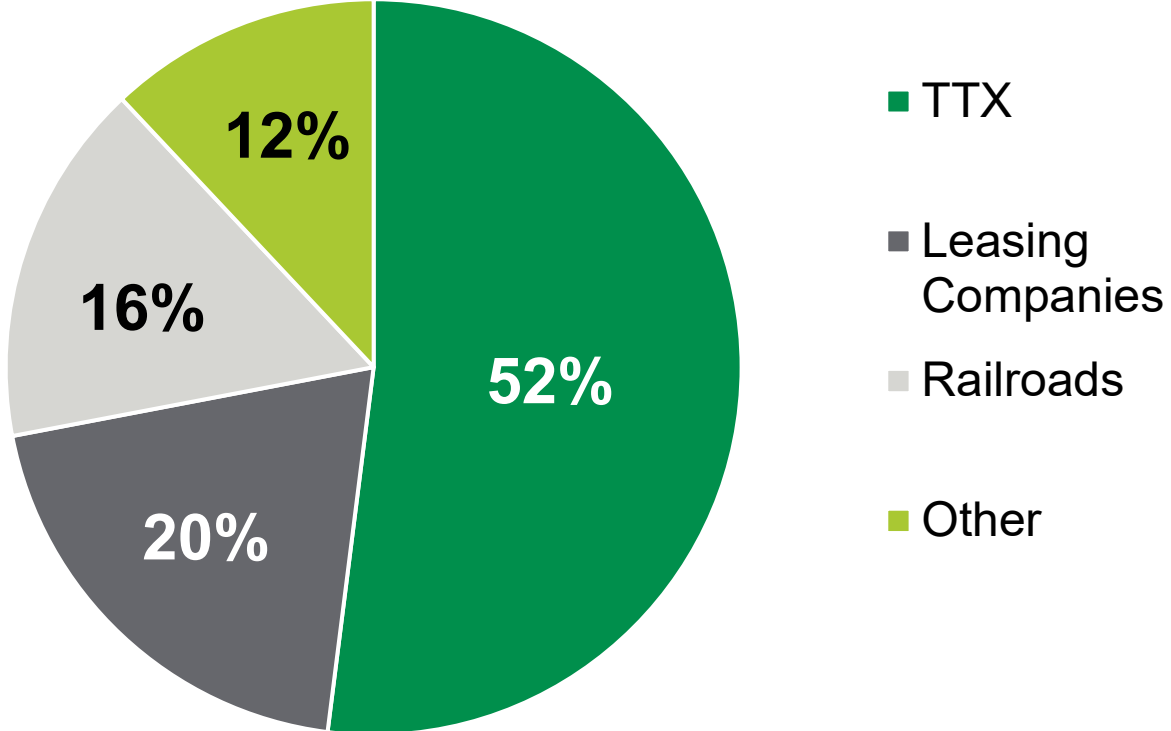
- Fallout will be high over the next decade
 - Average age is 28.6 years
 - Assuming all make it to their statutory retirement age, fallout will peak in 2029
 - 2030 and 2028 will have the next highest fallouts, respectively
 - No Anticipated ILS (Increased Life Service) on existing boxcars
- Boxcar additions have been significant
 - 16,939 added to the N.A. fleet in the last 5 years
 - New build boxcars are all high-capacity, GRL 286k
- Additional capacity will be needed to offset the anticipated fallout



21,000 Boxcars Built Since 2014



Share of Boxcar Builds
(since 2014)



100% = 21,124 per UMLER "Weighing Date"

Future Boxcars Types



Future Fleet: 50' Plate F Boxcar

FBOX

50'-6" 100-Ton Single Plug Door Boxcar

- *Application:* Commodity
- *Description:* 17'-0" high single-door boxcar with a capacity of 6.264 cubic feet and a load limit of 215,000 lbs.
- *Details:* Plate F, XM, 100-ton trucks
Available with either 10' or 12' single plug doors



Future Fleet: 60' Plate F Boxcar

TBOX

60'-9" 100-Ton Double Plug Door Boxcar

- *Application:* Commodity
- *Description:* 17'-0" high double-door boxcar with a capacity of 7,550 cubic feet and a load limit of 206,000 lbs.
- *Details:* Plate F, XM, 100-ton trucks
Double 8' plug doors



Boxcar Pooling Exercise



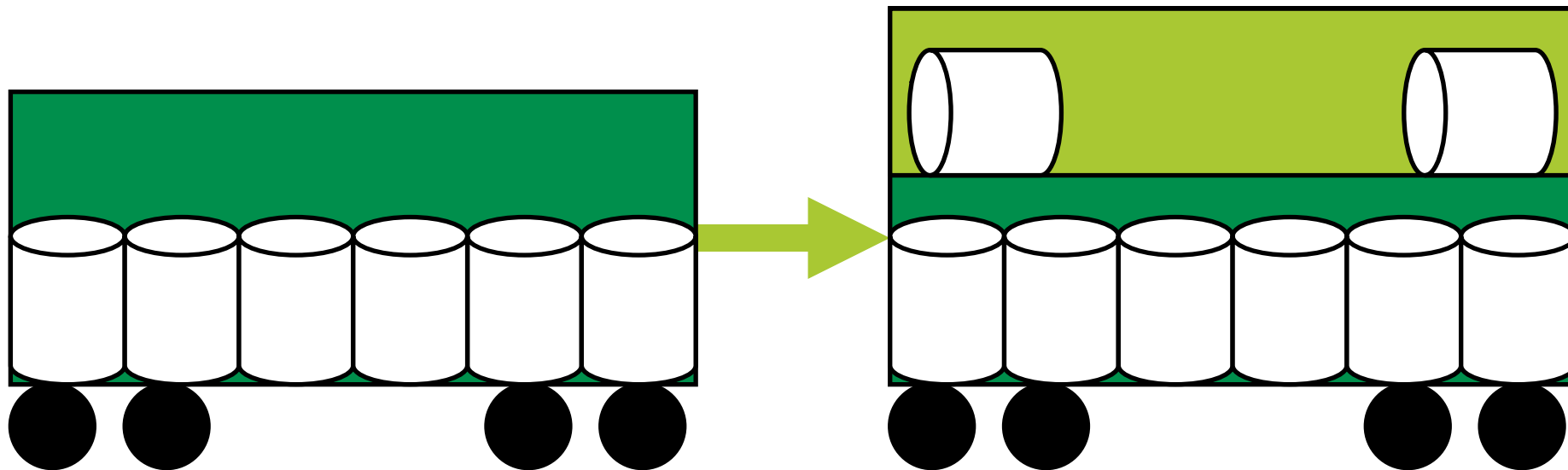
**10 70-ton
Plate C boxcars**



**7 100-ton
Plate F boxcars**

Moving to Plate F boxcar is 30% more productive

















Maximizing The Additional Capacity



50' 70-ton
Plate C

50' 100-ton
Plate F

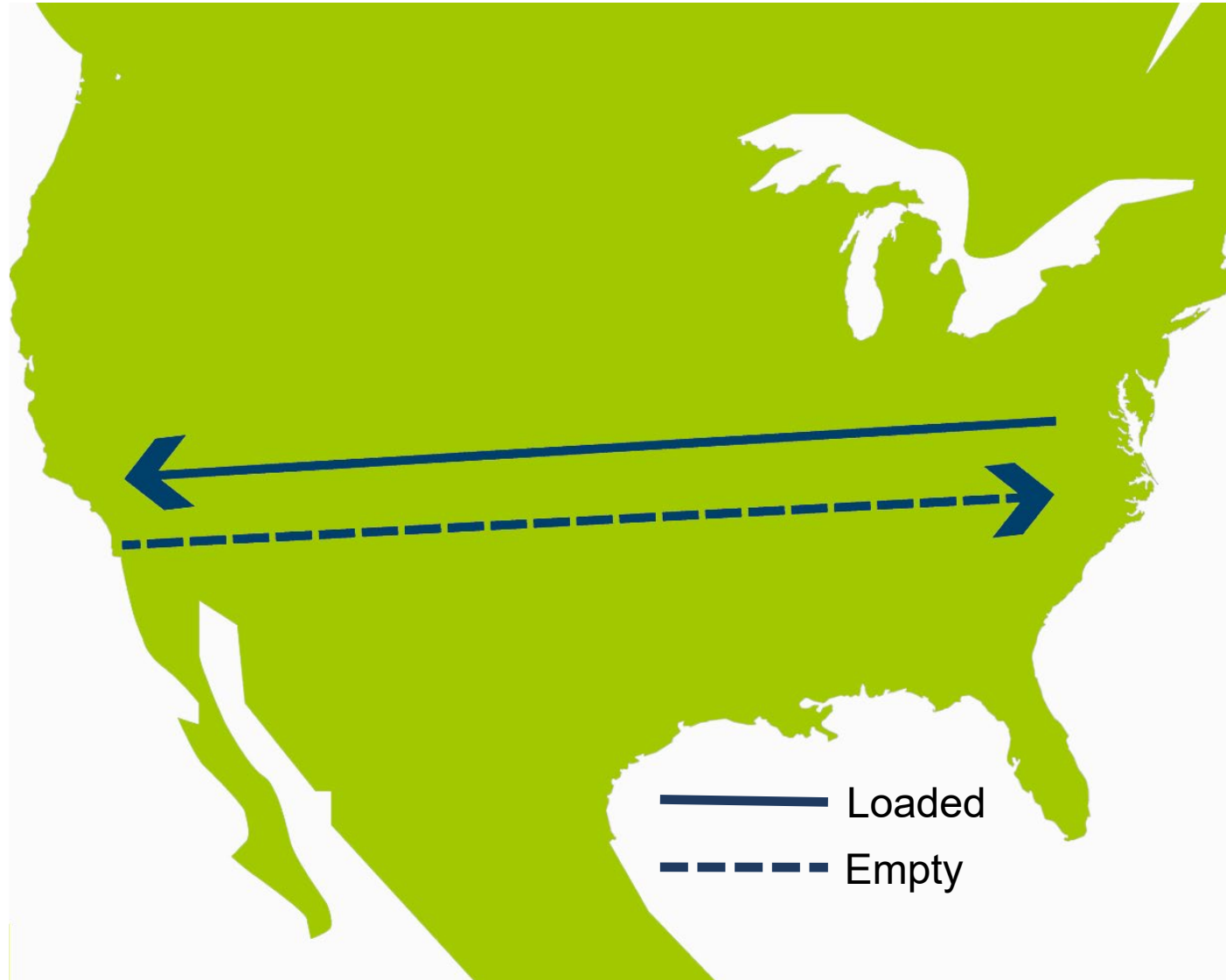
Future Fleet: The Dilemma

Boxcars				
70-ton	3 to 1	22.75 tons		
100-ton	4 to 1			
Jumbo				
100-ton	3.5 to 1	28.5 tons		
110-ton	4 to 1			
Coal				
100-ton	3.5 to 1	25 tons		
WV 100-ton	3 to 1	30 tons		
110-ton	4 to 1	25 tons		
WV 110-ton	3.6 to 1	30 tons		

National Pooling



How Boxcar Pooling Works

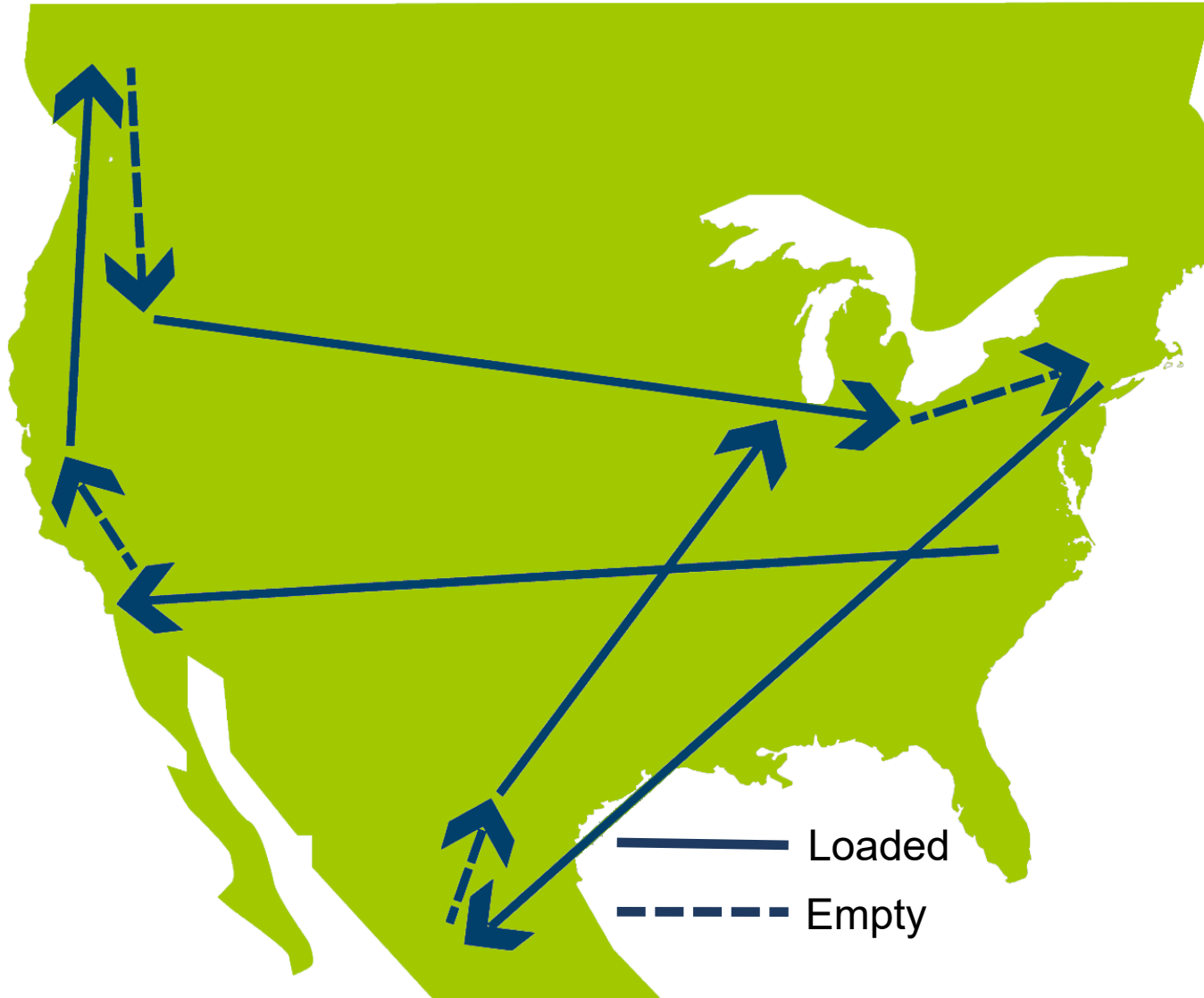


Standard Railcar Flow

- Newsprint to Los Angeles
- Empty return



How Boxcar Pooling Works



Potential National Boxcar Flow

- Newsprint to Los Angeles
- Canned tomatoes to Vancouver
- Plywood to Ohio
- Scrap paper to Mexico
- Beer to Chicago



How Boxcar Pooling Works

How it Works

- Allocation is based on the number of boxcars each RR puts in the pool
- Maximum limit of boxcars is equal to the number of originated loads per month
- Boxcars online determines if RR is above or below allocation
- Goal is to decrease DPL and reduce empty miles

Benefits

- Reduces empty car time and miles
 - Decreases empty car costs
- Reduces combined industry car need
 - Decreases car capital outlay

Three North American Boxcar Pools (NABP)

- Plate C pool was initiated by the railroads in 2003
 - Boxcars had high DPLs driven by long distance moves
- Two new pools incorporated in June 2010
 - 50' Plate F
 - 60' Plate F
- 9 participating railroads
 - UP, BNSF, CN, CP, CSX, NS, KCS, KCSM, Ferromex
- All Grade A boxcars and commodities

50 ft, Plate C (70–100-ton)

8,227 boxcars total
Rigid or Cushion
Slide or Plug Door

50 ft, Plate F (100-ton)

3,005 boxcars total
Cushion
Single Plug Door

60 ft, Plate F (100-ton)

5,720 boxcars total
Cushion
Double Plug Door

The Boxcar Pooling Model (NABP)



- Increased asset utilization
- Less empty miles
- Smaller fleet size

**Moving to a National Pool
is 40% more productive**

The Short Line Model for Boxcars: It's a Problem!



- All boxcars are assigned to specific short lines (i.e., FCRD, SMW)
- Free to the Short Line or Load Incentive
- Customers generally enjoy high order fulfillment and low/no demurrage

Summary

- All Class I railroads have started their boxcar replacement
- Two boxcar types instead of many (standardization)
 - 50' Plate F 100-ton single door
 - 60' Plate F 100-ton double door
- Fleet efficiencies will be gained through:
 - Moving to a higher cubic capacity/tonnage railcar
 - Moving to national pooling
- Fleet replacement will be 50–70% of current numbers
- Replacement needs to start soon...

