Outlook for Rail Crude Oil Transport

Rail Energy Transportation Advisory Committee

Surface Transportation Board

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Agenda

- Crude Oil in the News
- US Production Growth
- Crude-by-Rail Growth
- Market Dynamics
- Conclusion

Crude Oil in the News

- US Crude Oil Production Tops 7 Million Barrels Per Day; Highest since December 1992 *(EIA)*
- US Production Surge "Rebalancing" World's Oil Supply *(IHS)*
- Transportation Booms Alongside Shale Industry *(Calkins Media)*
- Canadian Crude Oil Finds a New Pathway Through Minnesota *(Star Tribune)*
- More Oil Traveling to Refineries on Trains *(AP)*
- Tank Car Production Bolsters Railcar Orders *(Railway Age)*
- Crude Oil Gains Flow Into State *(Times Record)*
- Oil and Gas Energy Sectors Responsible for 427,761 Jobs in Texas *(Texas Railroad Commission)*

Rail Investment in Crude

What the Analysts are Saying

“Rail provides better optionality…We expect rail to be part of the long-term infrastructure solution.” [Morgan Stanley]

“`Crude on rail` remains a promising opportunity for the North American Railroads.” [Wells Fargo]

“With limited pipeline infrastructure to reach the coasts from the interior shale regions, the railroads will likely be the long-term solution.” [Barclays]

“The enormous flexibility that the rails have to respond to rapidly changing… market conditions is a tremendous asset that should ensure the industry’s long-term sustainability in the shale revolution.” [Credit Suisse]

Source: Bloomberg, Business Week, Railway Age, various analysts equity research

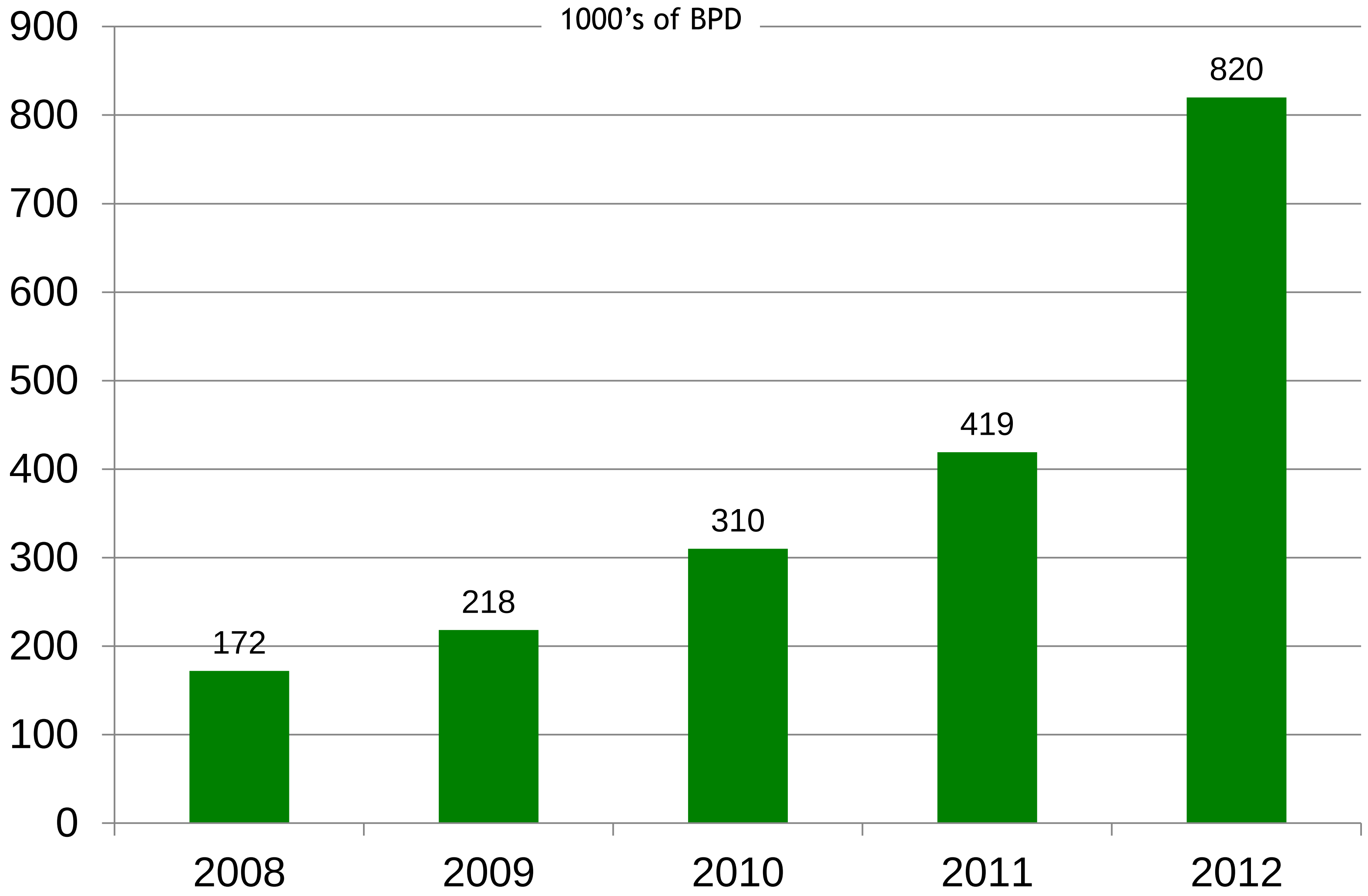
U.S. Crude Oil Production Growth

- In 2008, U.S. was producing 5M barrels per day (bpd)
- Domestic unconventional oil production contributed significantly to achieving 6M bpd in Q1 2012
- By Q4 2012 U.S. production reached to 7M bpd; a 20 year high
- Production in the shale areas have increased total domestic oil production by 40% since 2008
- Bakken and Eagle Ford production growth accounts for 1.2M bpd of growth; 60% of the total
- The International Energy Agency estimates that the U.S. will surpass Saudi Arabia in oil production by 2020

U.S. Shale Map

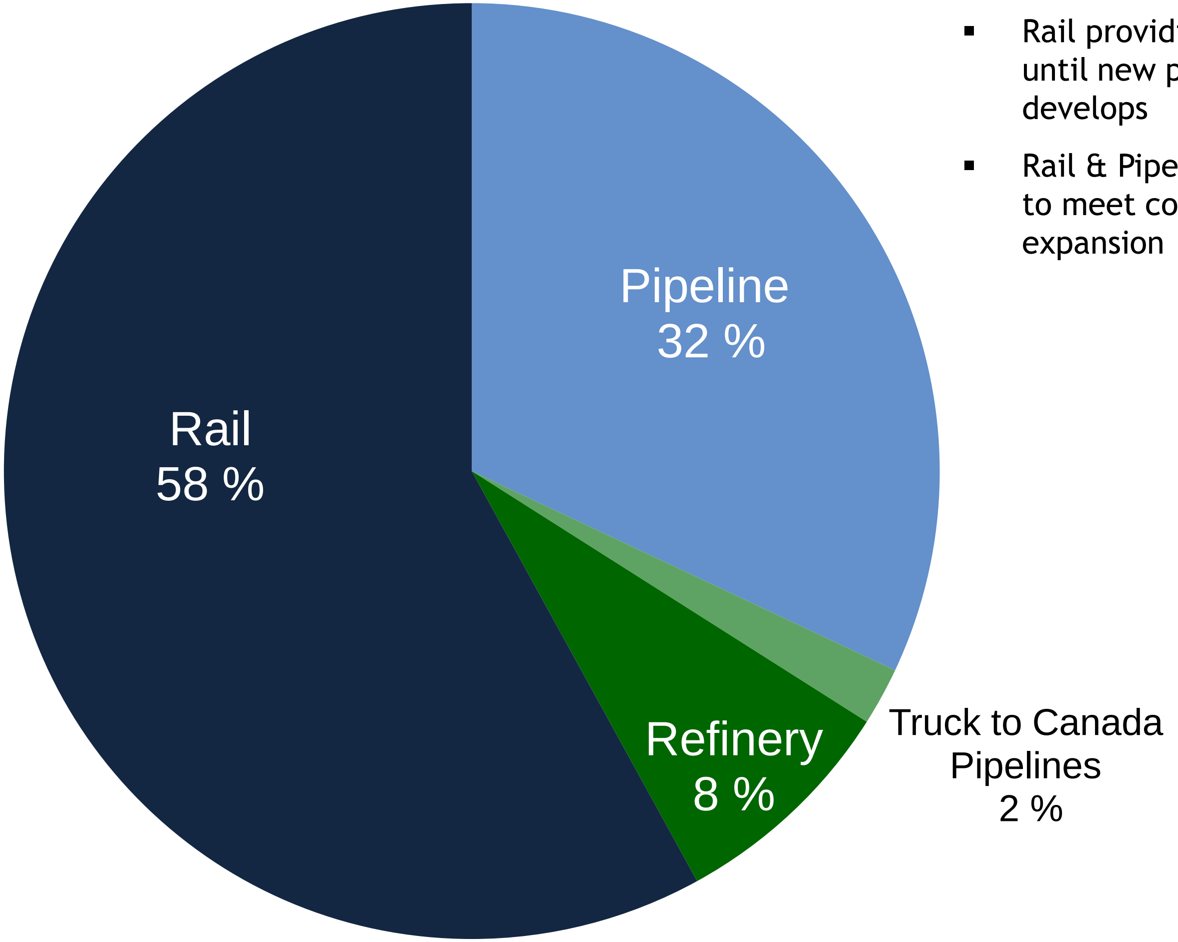

Niobrara*
Montana Thrust Belt
Bakken***
Heath**
Cody
Williston Basin
Big Horn Basin
Powder River Basin
Gammon
Hilliard-Baxter-Mancos
Mowry
Greater Green River Basin
Niobrara*
Park Basin
Uinta Basin
Manning Canyon
Mancos
Piceance Basin
Hermosa
Paradox Basin
Denver Basin
Forest City Basin
Excello-Mulky
Cherokee Platform
Michigan Basin
Antrim
Illinois Basin
New Albany
Appalachian Basin
Devonian (Ohio)
Marcellus
Utica
San Joaquin Basin
Monterey-Temblor
Monterey
Santa Maria, Ventura, Los Angeles Basins
Lewis
San Juan Basin
Raton Basin
Pierre
Woodford
Anadarko Basin
Fayetteville
Arkoma Basin
Chattanooga
Black Warrior Basin
Conasauga
Ardmore Basin
Palo Duro Basin
Bend
Floyd-Neal
Valley & Ridge Province
Avalon-Bone Spring
Permian Basin
Barnett
Ft. Worth Basin
TX-LA-MS Salt Basin
Tuscaloosa
Barnett-Woodford
Marfa Basin
Eagle Ford
Haynesville-Bossier
Pearsall
Western Gulf
Miles
0
100
200
300
400
Shale plays
Current plays
Prospective plays
Stacked plays
Shallowest/ youngest
Intermediate depth/ age
Deepest/ oldest
Basins
* Mixed shale & chalk play
** Mixed shale & limestone play
*** Mixed shale & tight dolostone-siltstone-sandstone
eia

Growth of Bakken Crude Oil Production



Source: EIA

Bakken Crude Oil Transportation - 2012



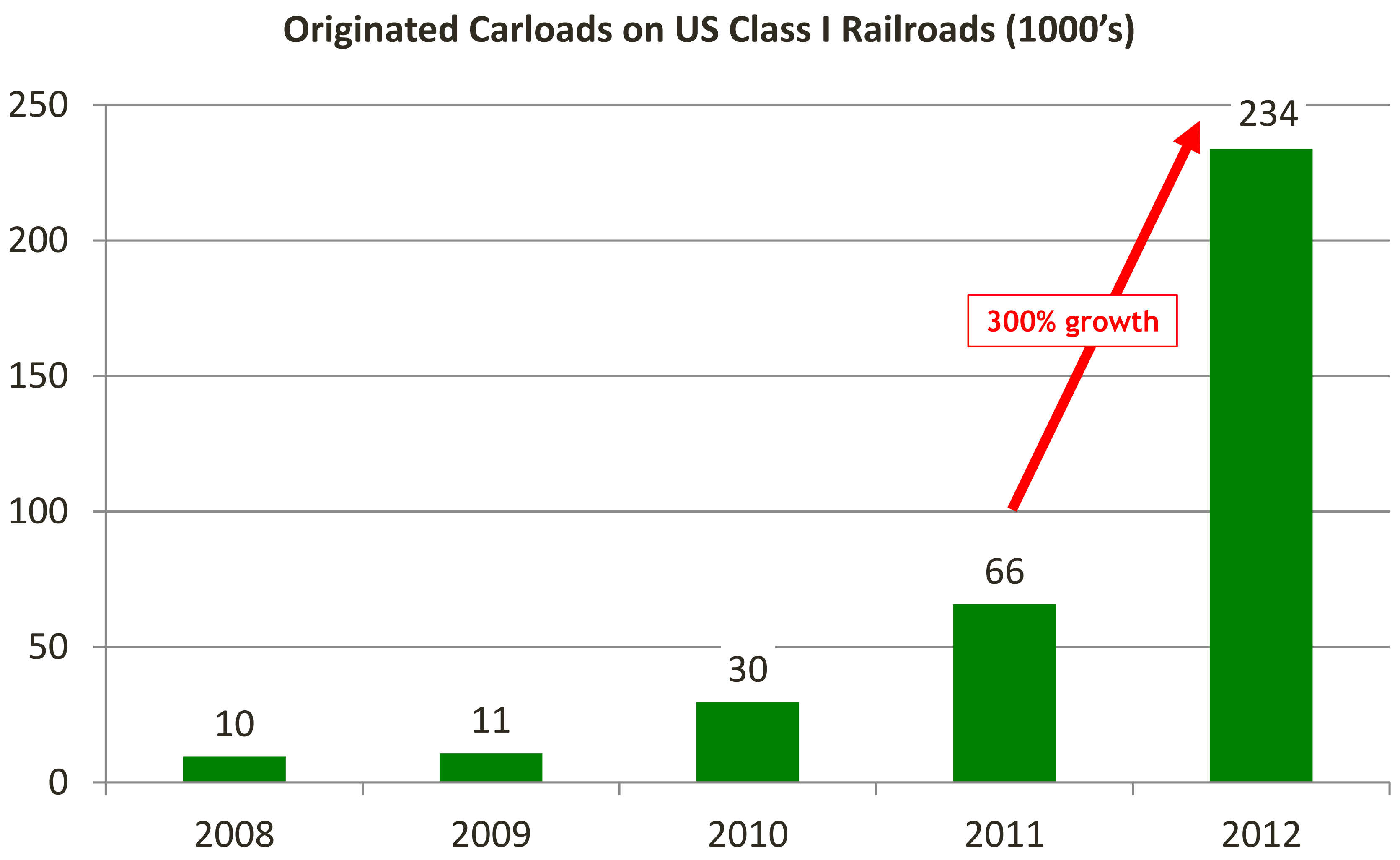
- Rail providing majority of transport until new pipeline infrastructure develops
- Rail & Pipeline growth both needed to meet continuing Bakken expansion

Source: North Dakota Pipeline Authority, November 2012 estimate

Why is Shipping Crude Oil by Rail Growing?

- Rapid unconventional production volume growth has outpaced traditional oil field export capacity
- Initially rail mode was considered a short-term solution until sufficient traditional capacity was developed
- The marketplace has enjoyed benefits in rail:
  - Capacity may be increased with a typically shorter lead time
  - More flexible off-take
    - *Ability to more effectively adapt to production fluctuations*
    - *Versatility in shipping to multiple markets*
  - Maximizes Crude Oil Value
    - *Access to higher demand markets*
    - *Potential availability of more alternatives within each market*
    - *Maintains quality of specification*

Crude Oil Rail Transport



Source: Association of American Railroads, 2012

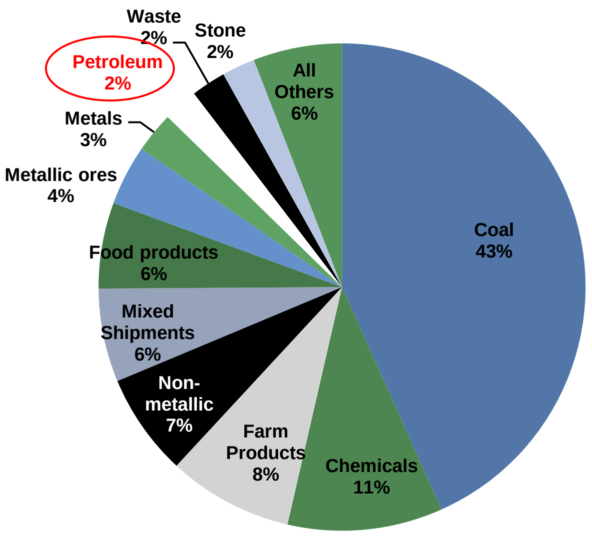
Room for Additional Growth

Type of Freight Carried for Year 2011 (preliminary)

Commodity Group	Tons Originated (000)	Tons Originated % of Total	Gross Revenue** (million)	Gross Revenue** % of Total
Coal	815,986	43.3 %	$16,138	24.7 %
Chemicals & allied prod.	193,661	10.3	8,984	13.8
Farm products	156,507	8.3	5,556	8.5
Non-metallic minerals	127,790	6.8	2,340	3.6
Misc. mixed shipments*	116,556	6.2	8,245	12.6
Food & kindred products	107,334	5.7	5,133	7.9
Metallic ores	76,035	4.0	699	1.1
Metals & products	50,343	2.7	2,517	3.9
Petroleum & coke	43,792	2.3	2,025	3.1
Waste & scrap materials	42,778	2.3	1,294	2.0
Stone, clay & glass prod.	41,801	2.2	1,599	2.4
Pulp, paper & allied prod.	31,628	1.7	2,090	3.2
Lumber & wood products	25,452	1.3	1,370	2.1
Motor vehicles & equip.	23,403	1.2	4,046	6.2
All other commodities	32,372	1.7	3,221	4.9
Total	**1,885,437**	**100.0 %**	**$65,258**	**100.0 %**

* Miscellaneous mixed shipments (STCC 46) is almost all intermodal traffic. Some intermodal traffic is also included in commodity-specific categories. STCC 46 accounts for about two thirds of intermodal tonnage.

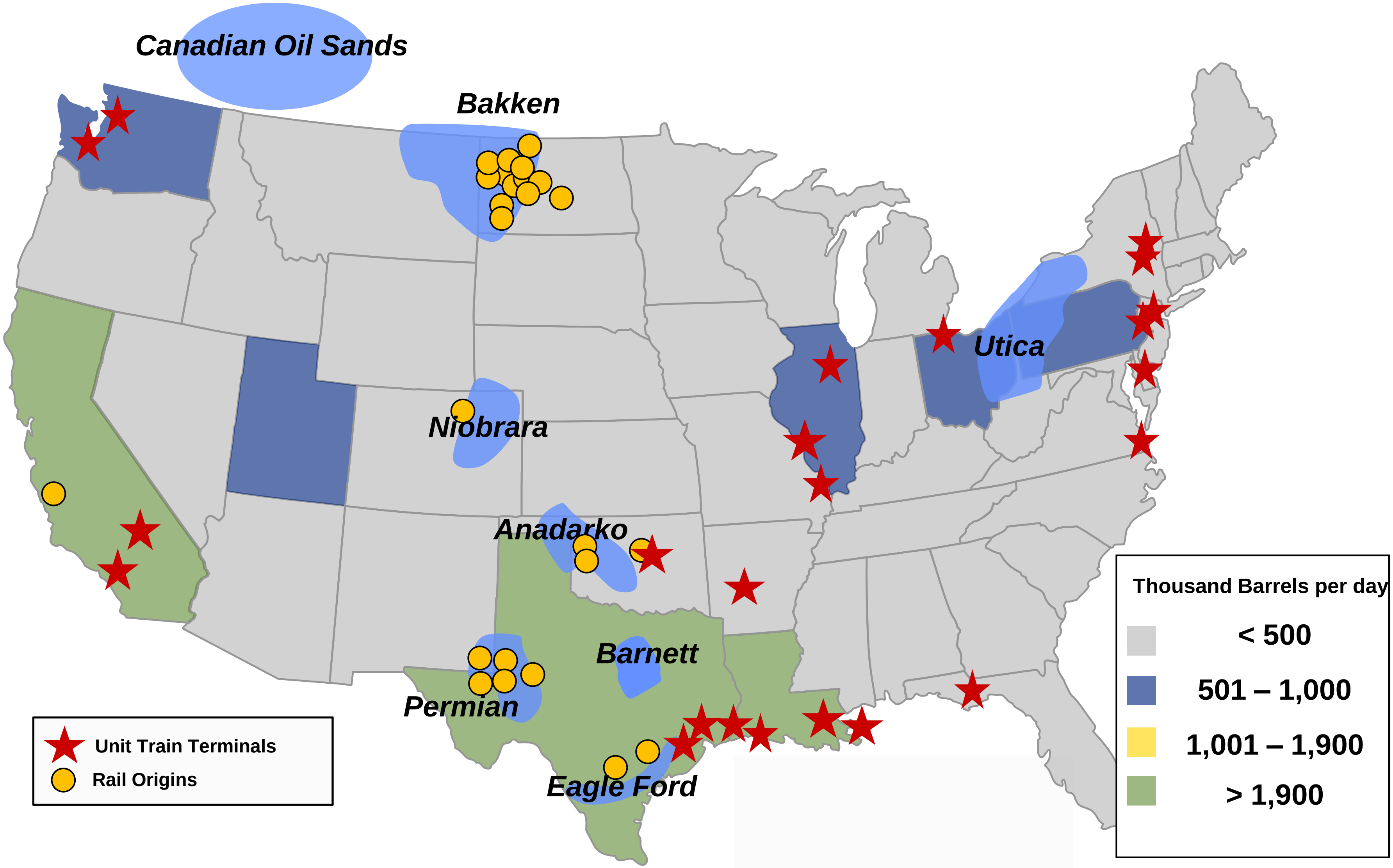
** Gross Revenue is not adjusted for absorption (incentive rebates etc.) or correction.



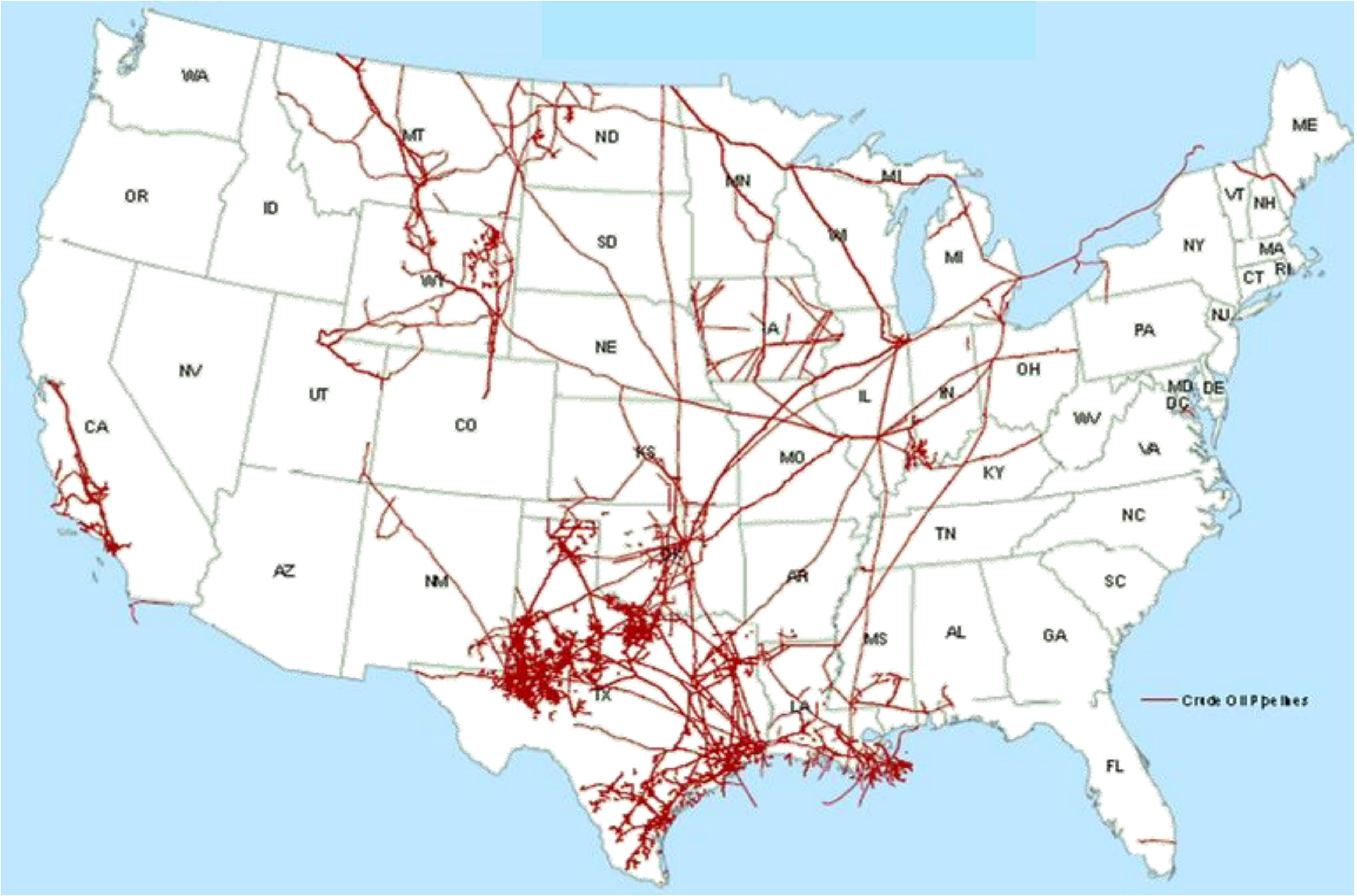
Source: Association of American Railroads, 2012

Consumptive Demand by State

Key Crude Oil Rail Origins and Destination Facilities

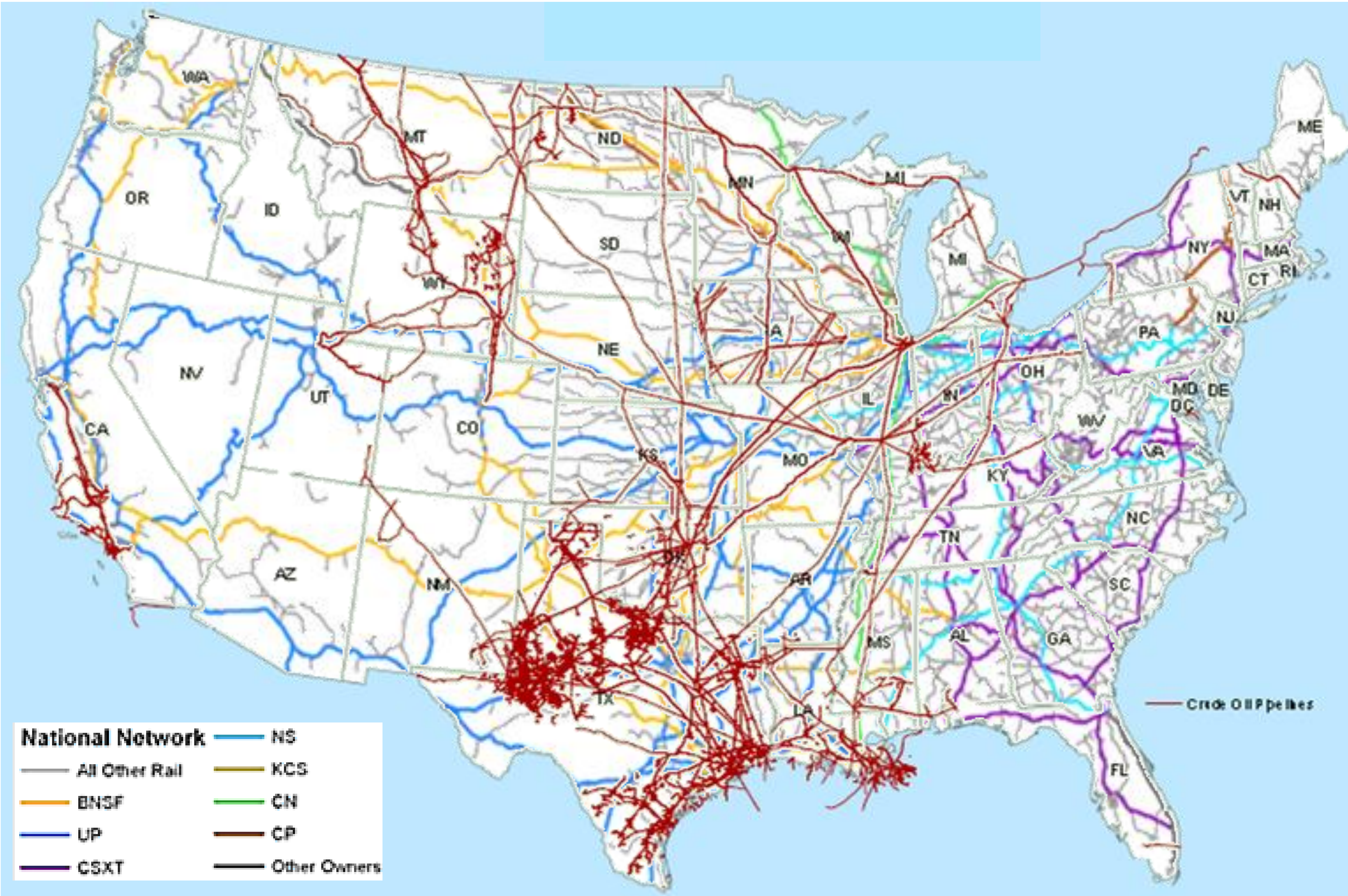


U.S. Crude Oil Pipelines



Source: API, American Energy Mapping 2013

U.S. Crude Oil Pipelines & Class I Railroads



Sources: API, American Energy Mapping 2013, Association of American Railroads, 2012

Rail Investment in Crude

What the Railroads are Doing

BNSF: $200+ million in infrastructure to support crude growth

CN/Tundra: MOU for Cromer, MB crude oil loading terminal

CP: Opened rail hub in North Dakota in 2012; $90+ million to upgrade Manitoba to Saskatchewan line

CSX: $26 million for River Line track expansion

UP: $225+ million in Southern Region capacity/commercial facilities infrastructure during 2012 with continued spending in 2013 to support overall volume growth

Sources: Bloomberg, Business Week, Railway Age, various analysts equity research

North American Production & Distribution

- U.S.
  - Production growth continues in Bakken, Permian, and Eagle Ford formations; others to follow
  - Growth projected from 6.7M bpd in 2012 to 11.6M bpd in 2022

- Canada
  - Expected to provide more than 80% of U.S. crude imports by 2022
  - Growth projected from 3.5M bpd in 2011 to 5.6M bpd in 2025

- Rail is important key to accommodate this new growth
  - If half of this incremental 7M bpd moves by rail, there will be a need for a fleet of at least 70,000 railcars to move it
  - Pipeline infrastructure is not in place yet; future pipeline development is an open question

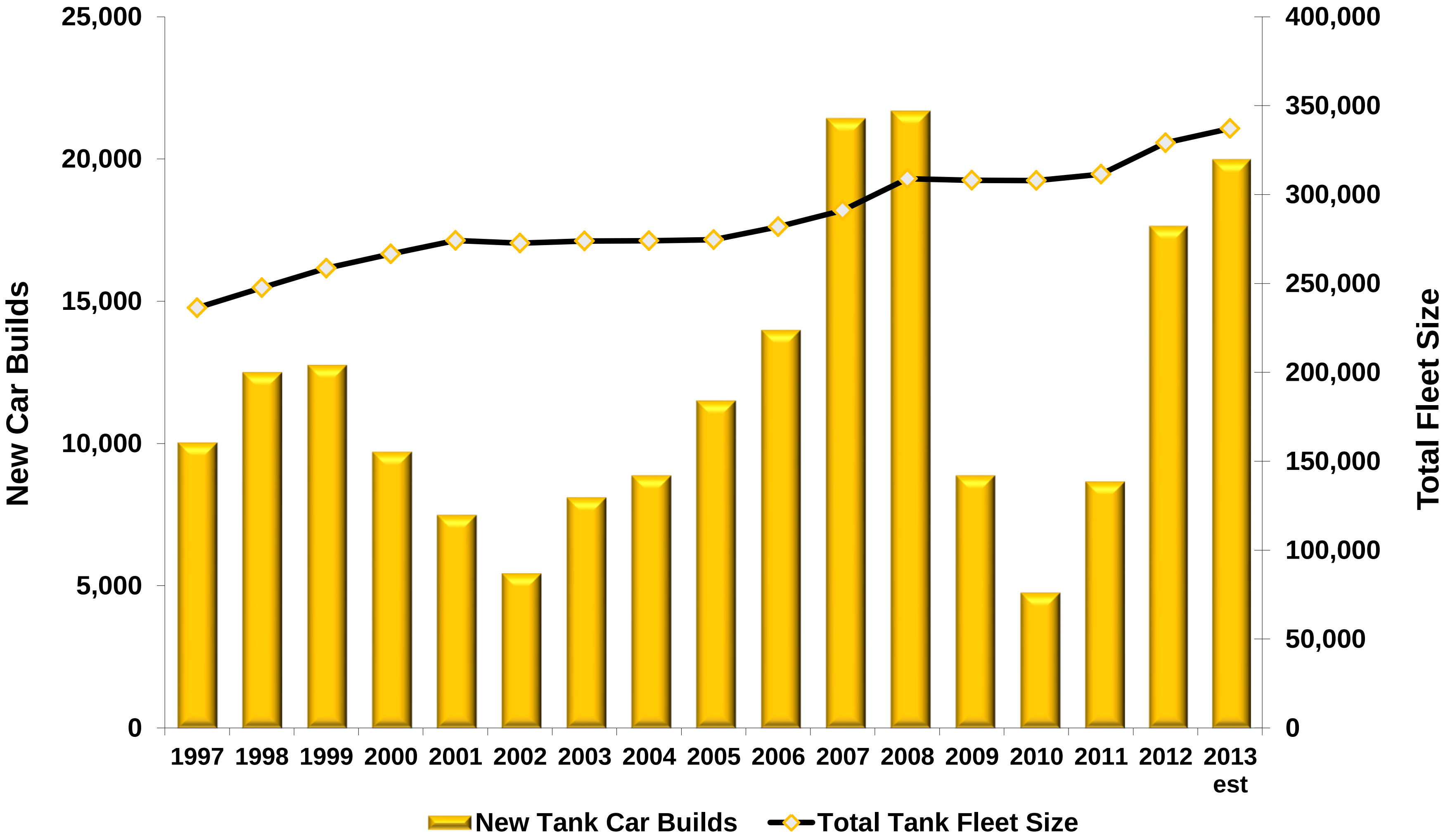
Sources: BENTEK, GATX

Tank Car Production Backlogs

- Tank cars are at a historically and disproportionately high percent of the overall railcar market
- 80% of current railcar backlog is tank cars (48.2K out of 60.2K)
- Crude-capable fleet up 22.3K since 1/1/08
  - If non-crude tank car demand is down roughly 10%, this suggests the crude fleet is at roughly 30K cars.
  - This would imply a current crude-by-rail **<u>capability</u>** in North America of roughly **<u>1 to 1.5M bpd</u>** depending upon turn times, car types, and crude types

Source: ARCI, FTR, EPA, AAR

North American Tank Car Fleet



Sources: AAR, GATX, Global Insight, Barclays

Crude-by-Rail Growth Risks

- Railroad capacity/service – Carriers performing well to date
- Development of loading and off-take terminals
- Adequate tank car fleet – limited manufacturing capacity
- Ongoing tank car regulatory activity
  - FRA and industry have collaborated on design improvement Task Forces for Packing Groups I & II
  - The consensus result is Petition P-1577 before PHMSA for approval
  - With AAR CPC-1232 the industry has self-adopted the P-1577 standard for new crude oil tank cars
  - Prompt approval needed to address uncertainty from lack of approval
  - Consideration of new design requirements tied to older cars
  - API/RFA/ACC/CI Petition P-1612 supported by RSI suggests prompt approval of P-1577 specification separate from the "pre-Petition" cars

Conclusion

- North America has the potential to be energy independent by developing crude oil and shale gas
- America is undergoing a large shift in how/where we extract our energy resources
- Development is outpacing infrastructure
  - Crude purchasers can get crude from oil fields to chosen destination by rail
- Increased reliance on rail by the oil industry and increased demand for tank cars
- Oil industry can continue to increase rail shipments beyond historical levels