

# PETROLEUM WATCH

CALIFORNIA ENERGY COMMISSION

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## REFINERY NEWS

### • Chevron Richmond:

On June 15, news reported that the refinery is scheduled to carry out maintenance on multiple units ([Bloomberg](#)).

## CALIFORNIA GASOLINE RETAIL PRICES BY BRAND

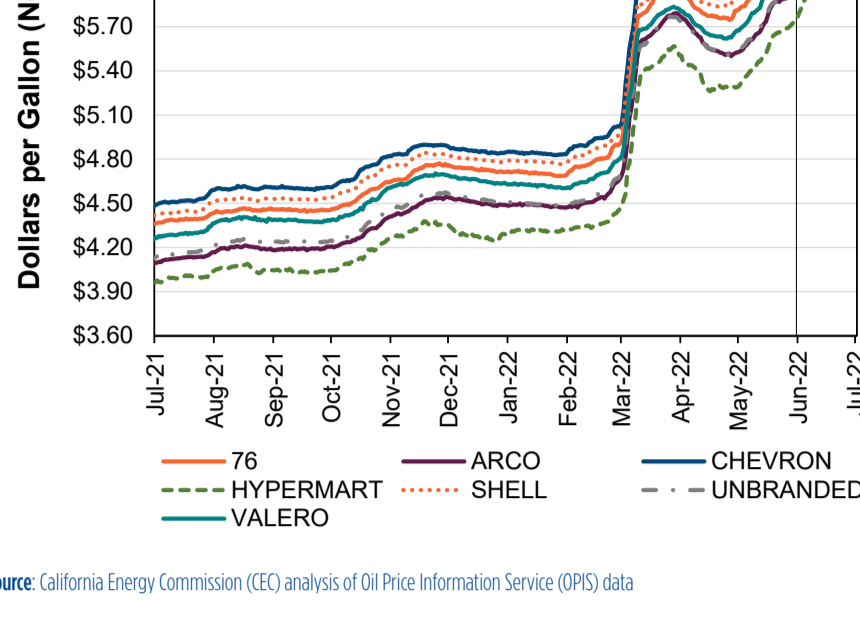
### June 2022 vs. 2021

(Percentage Change)

76	49% higher
ARCO	53% higher
Chevron	49% higher
Hypermart	53% higher
Shell	49% higher
Unbranded	52% higher
Valero	50% higher

### June 2022 Averages

76	\$6.41
ARCO	\$6.19
Chevron	\$6.58
Hypermart	\$5.97
Shell	\$6.51
Unbranded	\$6.20
Valero	\$6.34



Source: California Energy Commission (CEC) analysis of Oil Price Information Service (OPIS) data

## CALIFORNIA DIESEL RETAIL PRICES BY REGION

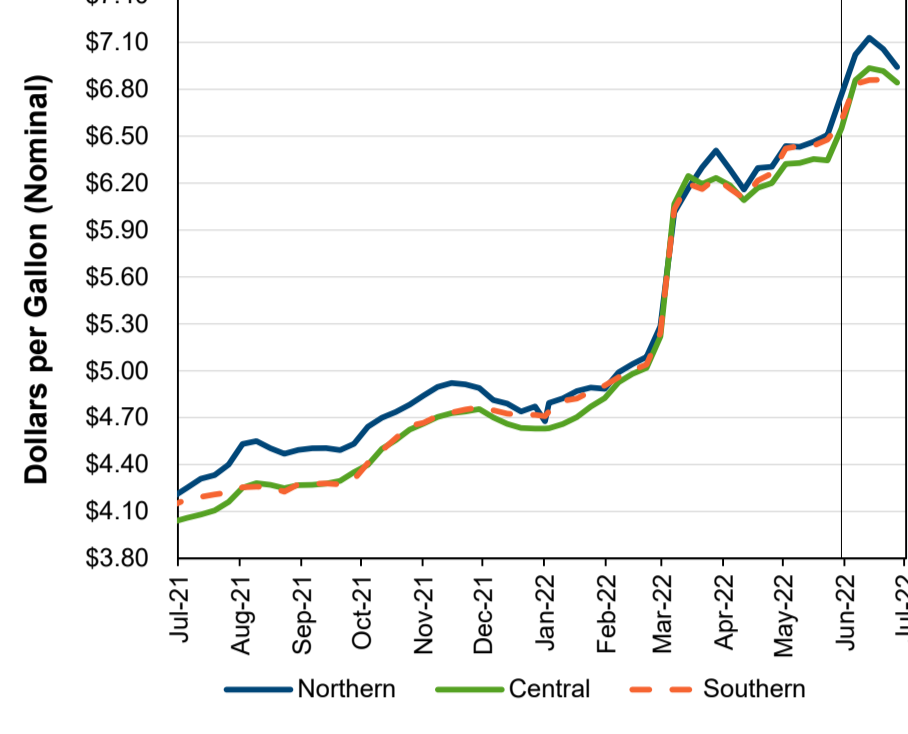
### June 2022 vs. 2021

(Percentage Change)

Northern CA	69% higher
Central CA	72% higher
Southern CA	66% higher

### June 2022 Averages

Northern CA	\$7.03
Central CA	\$6.86
Southern CA	\$6.82



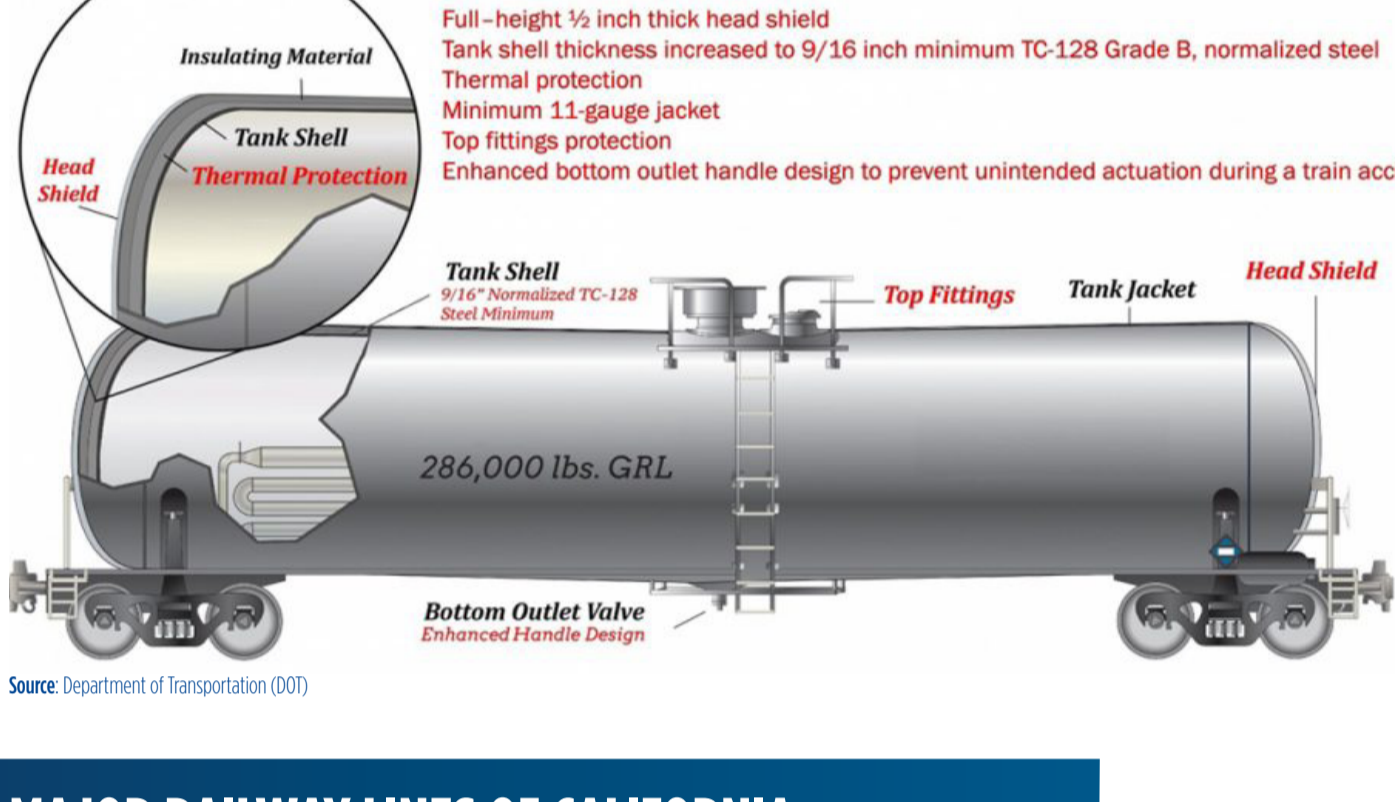
Source: CEC analysis of OPIS data

## DOT-117 SPECIFICATION CAR

### DOT 117 Specification Car

#### Safety enhancements of DOT Specification 117 Tank Car:

- Full-height ½ inch thick head shield
- Tank shell thickness increased to 9/16 inch minimum TC-128 Grade B, normalized steel
- Thermal protection
- Minimum 11-gauge jacket
- Top fittings protection
- Enhanced bottom outlet handle design to prevent unintended action during a train accident



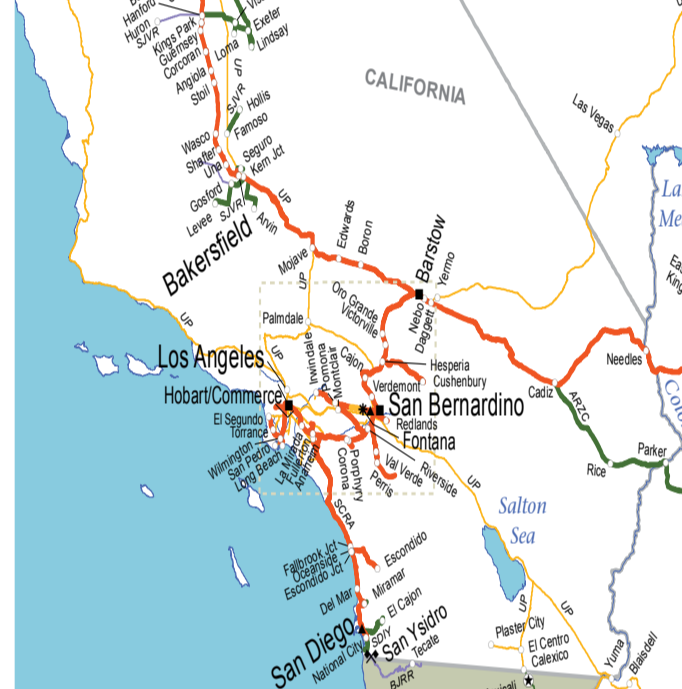
Source: Department of Transportation (DOT)

## MAJOR RAILWAY LINES OF CALIFORNIA

### NORTHERN CALIFORNIA



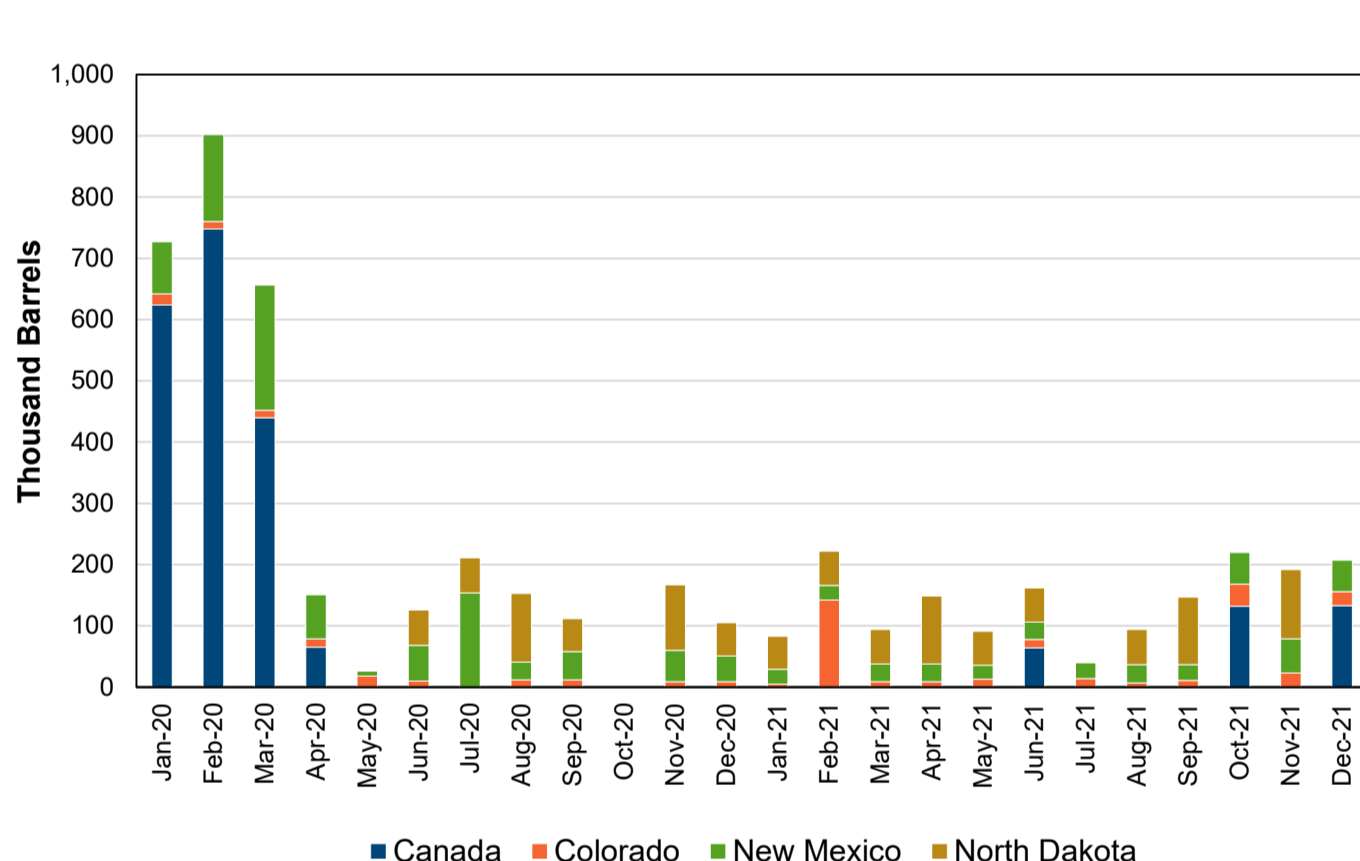
### SOUTHERN CALIFORNIA



Legend: BNSF (orange), Union Pacific (UP) (yellow), UP/SP Trackage Rights (red), Other Rail Systems (purple)

Source: Burlington Northern and Santa Fe Railway (BNSF)

## CRUDE OIL BY RAIL INTO CALIFORNIA (2020-2021)



Source: CEC analysis of Petroleum Industry Information Act (PIIRA) data

## FEATURED TOPIC

### A PRIMER ON TRANSPORTATION OF CRUDE OIL BY RAIL CAR

The transportation of crude oil is a vital part of the petroleum industry. Transportation must be done safely, protecting the environment, but in quantities to meet societal needs. Using rail cars is one method of transporting crude oil. This Petroleum Watch discusses the transport of crude oil by rail car, some of the history that has led to the current standards for car construction, the routes taken, the destinations for this product, and the quantities that enter California.

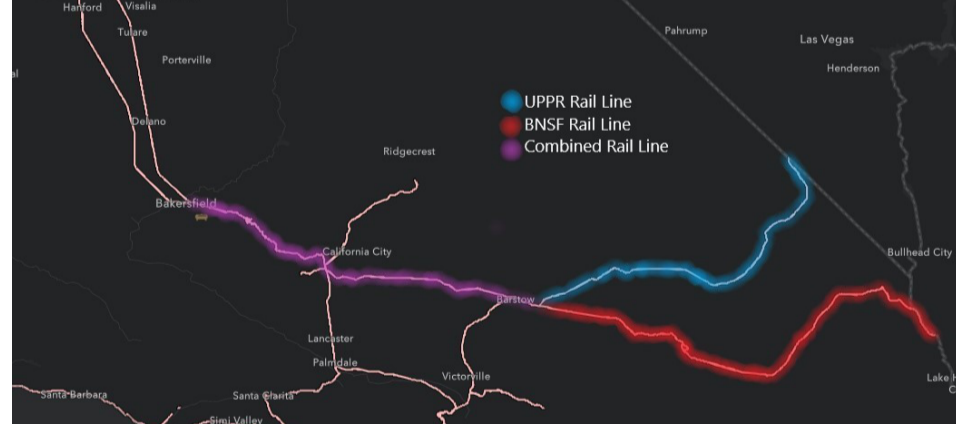
### BACKGROUND OF CRUDE OIL BY RAIL

The three main methods of transporting crude oil are marine transport, pipelines, and rail car. Marine and pipeline transportation methods are cheaper as they can transport larger amounts of crude oil, lowering the per barrel cost. Crude by rail or transport by rail car is an alternative when the other two methods are unavailable. Rail cars cannot carry as much crude oil as their counterparts, therefore it has a higher cost per barrel. Even with its higher cost, crude by rail is a necessary part of the industry as it serves areas that do not have access to marine or pipeline transportation. Refiners will also use rail if they need some crude oil quickly or if the price is low enough. Marine transport, in general, takes up to 30 days to arrive, while rail sources take 14. Crude transported by rail is sometimes sold at a discount to offset the high cost of rail transport, and if the price is low enough, refineries will import more.

The transportation of crude oil by rail is common and generally safe. Unfortunately, to reach this point, major accidents in the past exposed gaps in safety standards. The Lac-Mégantic tragedy, in Quebec, Canada, occurred in July 2013 when an unattended runaway train carrying 72 cars of crude oil derailed in the center of the town. The resulting explosion killed 47 people and over 2,000 people had to be evacuated. Another incident occurred in December 2013. Two trains collided outside of a small town in North Dakota; one train was 106 cars long carrying crude oil. Several cars exploded outside of the town, but all residents evacuated safely without injuries.

Accidents such as these have spurred the adoption of higher safety standards for rail cars that

### CRUDE OIL RAIL SEGMENTS AND QUANTITIES (2021)



Rail Segment	Quantity (Barrels)
Needles to Barstow	1,065,647
Las Vegas to Barstow	637,673
Barstow to Bakersfield	1,703,320

Source: CEC analysis of PIIRA, California State Parks, Environmental Systems Research Institute (ESRI), HERE, Garmin, SafeGraph, Food and Agriculture Organization (FAO), Ministry of Economy, Trade, and Industry (METI)/United States National Aeronautics and Space Administration (NASA), United States Geological Survey (USGS), Bureau of Land Management, Environmental Protection Agency (EPA), and National Park Service (NPS) data

carry explosive materials including crude oil. The U.S. Department of Transportation (DOT) and Canada have adopted the new standard, known as DOT-117, requiring thicker tank walls with insulation, puncture protection, a full head shield, and top and bottom valve fitting protections. [DOT-117 Specification Car](#) highlights the improvements. The older, less safe DOT-111 standard cars have not been allowed to transport crude oil since March 1, 2018, while the safer version CPC-1232 will be phased out by May 1, 2025. CPC-1232 is allowed a longer transition period due to their higher safety standards compared to DOT-111, but they are not as safe as DOT-117.

### CURRENT STATE OF CRUDE OIL BY RAIL

Rail transportation is well established in the U.S. and there is a very large national rail network that is excellent for transporting various goods across the country. [Major Railway Lines of California](#) details the major carrier lines in Northern and Southern California. These rail lines carry all types of products and are not limited to crude oil. It is important to see the whole system as there are limited entries into and out of California. Even though rail lines are owned by competing companies, there is a level of coordination and route sharing necessary to ship goods throughout the state.

[Crude Oil by Rail Into California \(2020-2021\)](#) shows the amount of crude oil transported by rail into California over the past two years. January-March 2020 data is indicative of pre-pandemic import trends. At the time, a large amount originated from Canada due to a large discount, but as the pandemic set in and lockdowns started, demand destruction reduced the need for crude oil. In 2020, 3.3 million barrels

of crude oil was imported into California. In 2021, total crude by rail imports into California dropped to 1.7 million barrels; a drop of 52 percent. The pandemic also altered the sources of crude oil being supplied by rail cars. Canada was the largest supplier of crude oil by rail in 2020, but as demand went down and prices became comparable, Canadian oil was replaced by domestic sources from North Dakota, Colorado, and New Mexico.

### Crude Oil Rail Segments and Quantities (2021)

[Crude Oil Rail Segments and Quantities \(2021\)](#) shows the common routes that crude oil enters California by rail and quantities for 2021. The destination for all crude oil by rail in 2021 was in Kern County, specifically Bakersfield, which has three refineries that process crude oil. There are two major routes entering California, represented by the red and blue routes highlighted in [Crude Oil Rail Segments and Quantities \(2021\)](#). All crude oil enters through Nevada and Arizona because of fewer stops compared to entering through Northern California. In 2021, 1.1 million barrels of crude oil entered California by rail via the Needles to Barstow line represented by the red route, while 0.6 million barrels traveled on the Las Vegas to Barstow route represented by the blue route. All crude oil then traveled from Barstow to Bakersfield totaling the 1.7 million barrels that entered California in 2021. Of the total amount of crude oil imported into California in 2021, less than 0.5 percent came in by rail car compared to 99.5 percent by marine vessel.

Crude by rail is a reliable way to transport crude oil in land locked areas, second only to pipelines. While there are always safety concerns when transporting flammable and explosive materials, new standards provide better safety and reliability for transporting crude oil by rail.

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The CEC welcomes feedback on Petroleum Watch. Please contact Media and Public Communications Office at [mediaoffice@energy.ca.gov](mailto:mediaoffice@energy.ca.gov).

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