



# Illinois Pipeline Study

for Illinois Department of Transportation



Illinois State Freight Advisory Council

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During this session, an online audience response application (Mentimeter) will be used to collect your inputs



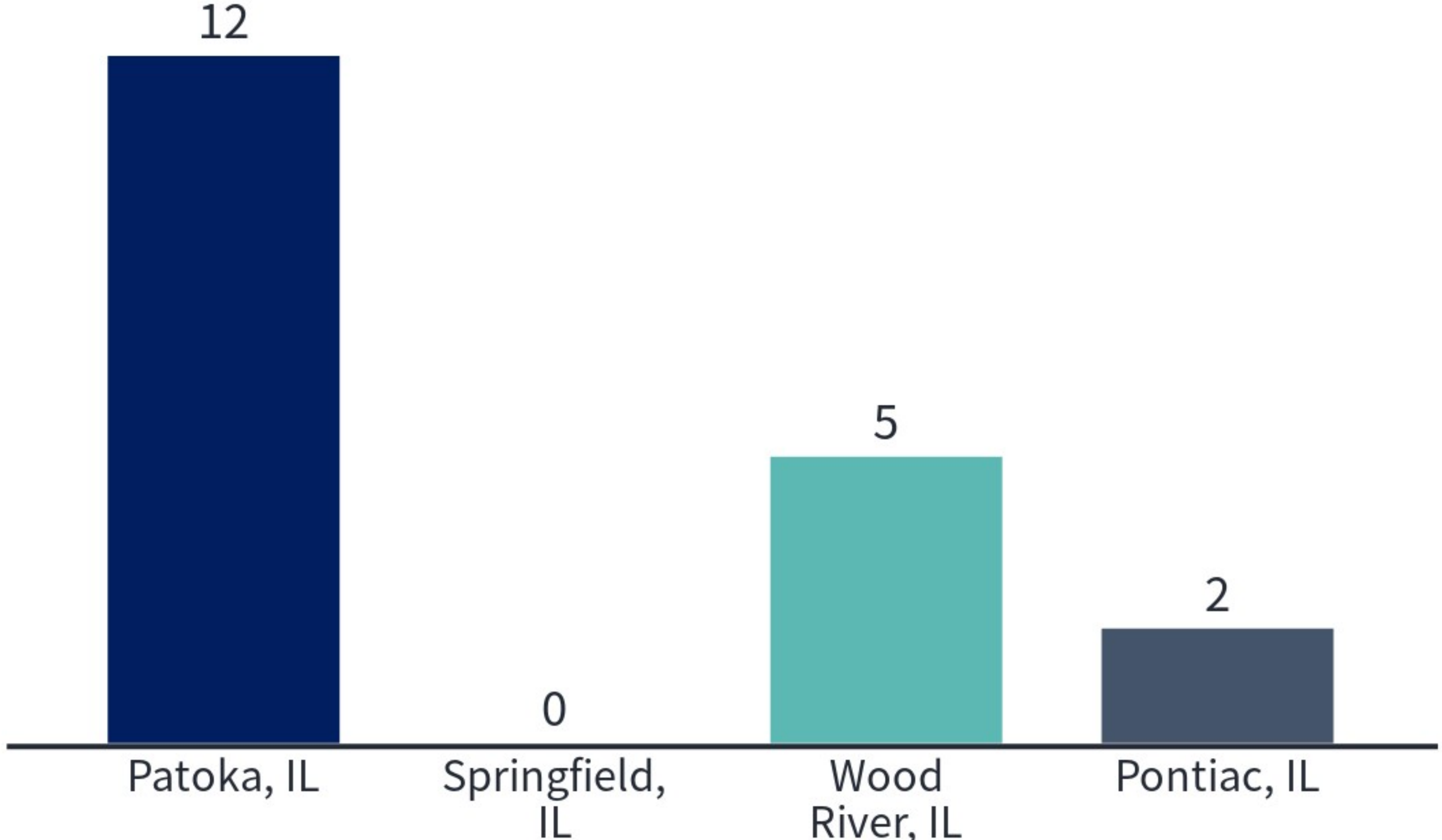
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# Where is the 2nd largest crude oil terminal in the U.S. located?



# Illinois Pipeline Trivia

➤ Where is the 2nd largest crude oil terminal in the U.S. located?

- a. Patoka, IL
- b. Springfield, IL
- c. Wood River, IL
- d. Pontiac, IL

**Patoka, IL**



**Crude oil storage:** 80+ tanks

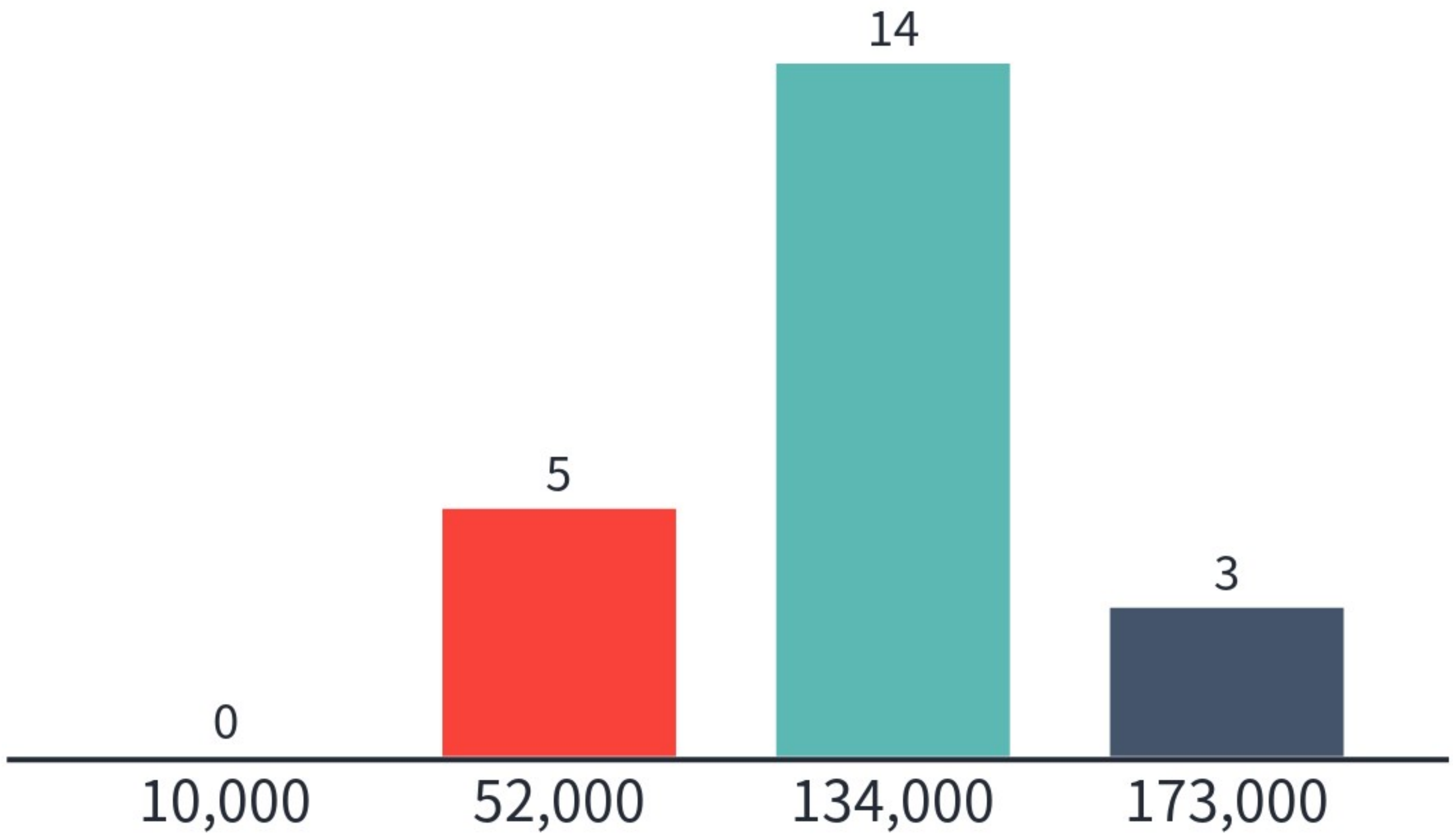
**Total capacity:** >19 million barrels

**Connecting pipelines:** 12 active pipelines

**Crude oil sources:** Bakken, Canada, US Gulf Coast

Source: Dakota Pipeline facts, 2019

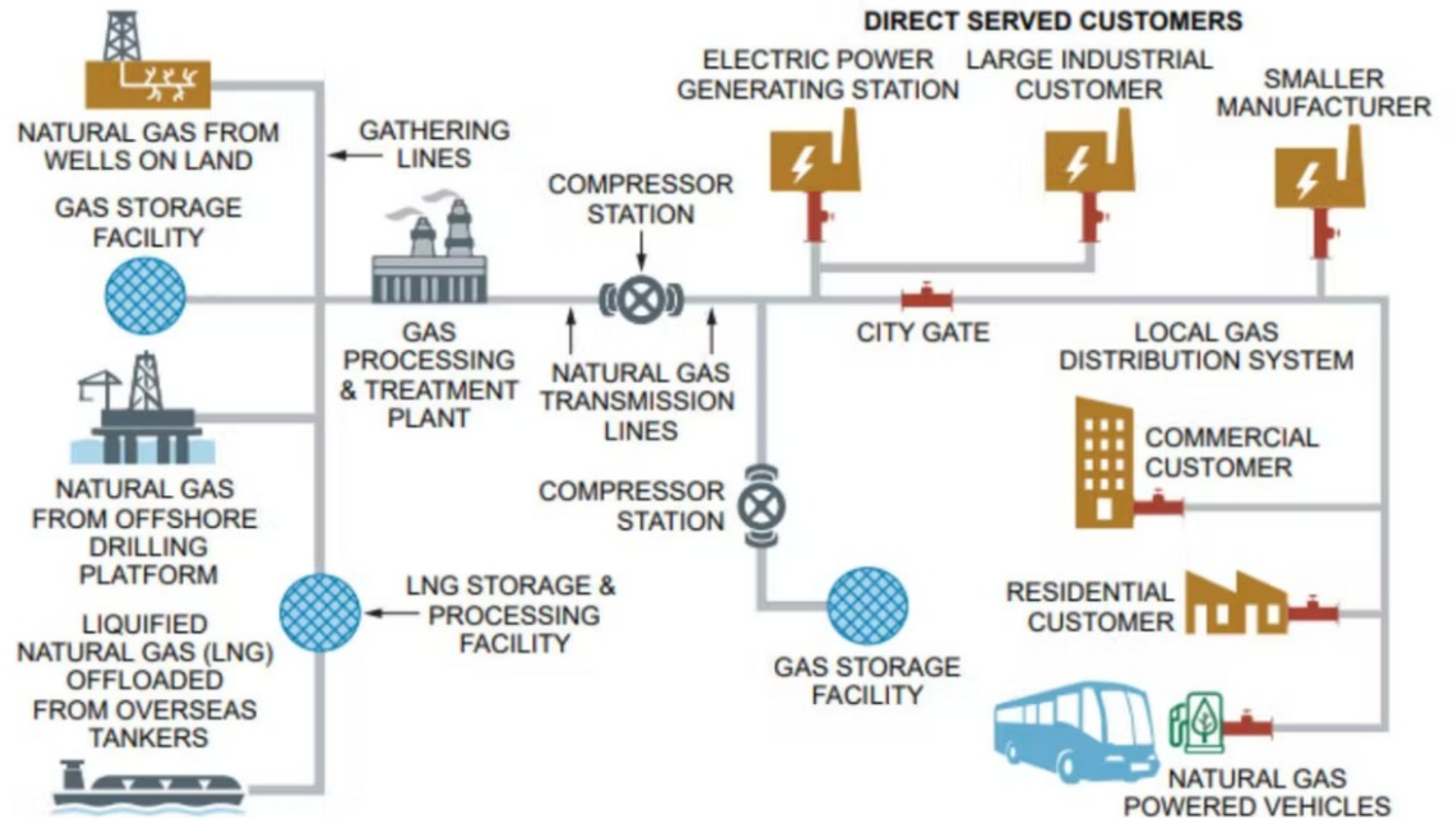
# What is the total number of pipeline miles located in Illinois?



# Illinois Pipeline Trivia

➤ What is the total number of pipeline miles located in Illinois?

- a. 10,000
- b. 52,000
- **c. 134,000**
- d. 173,000



Illinois has over 134,000 miles of crude oil, highly volatile liquids (HVL), refined petroleum, and natural gas pipelines

- Almost 94% of all miles transport natural gas
- 4<sup>th</sup> largest refinery capacity in the US
- Total refining capacity of over one million barrels per calendar day



# Study Objective

## ➤ Complement the Illinois State Freight Plan

- Identify the location of pipelines running throughout the State of Illinois, commodities carried, and where they originate and terminate
- Identify role of pipelines in Illinois's multimodal freight transportation system
- Assess the potential effects of a loss of pipeline operation in the state
- Identify IDOT's role in pipelines

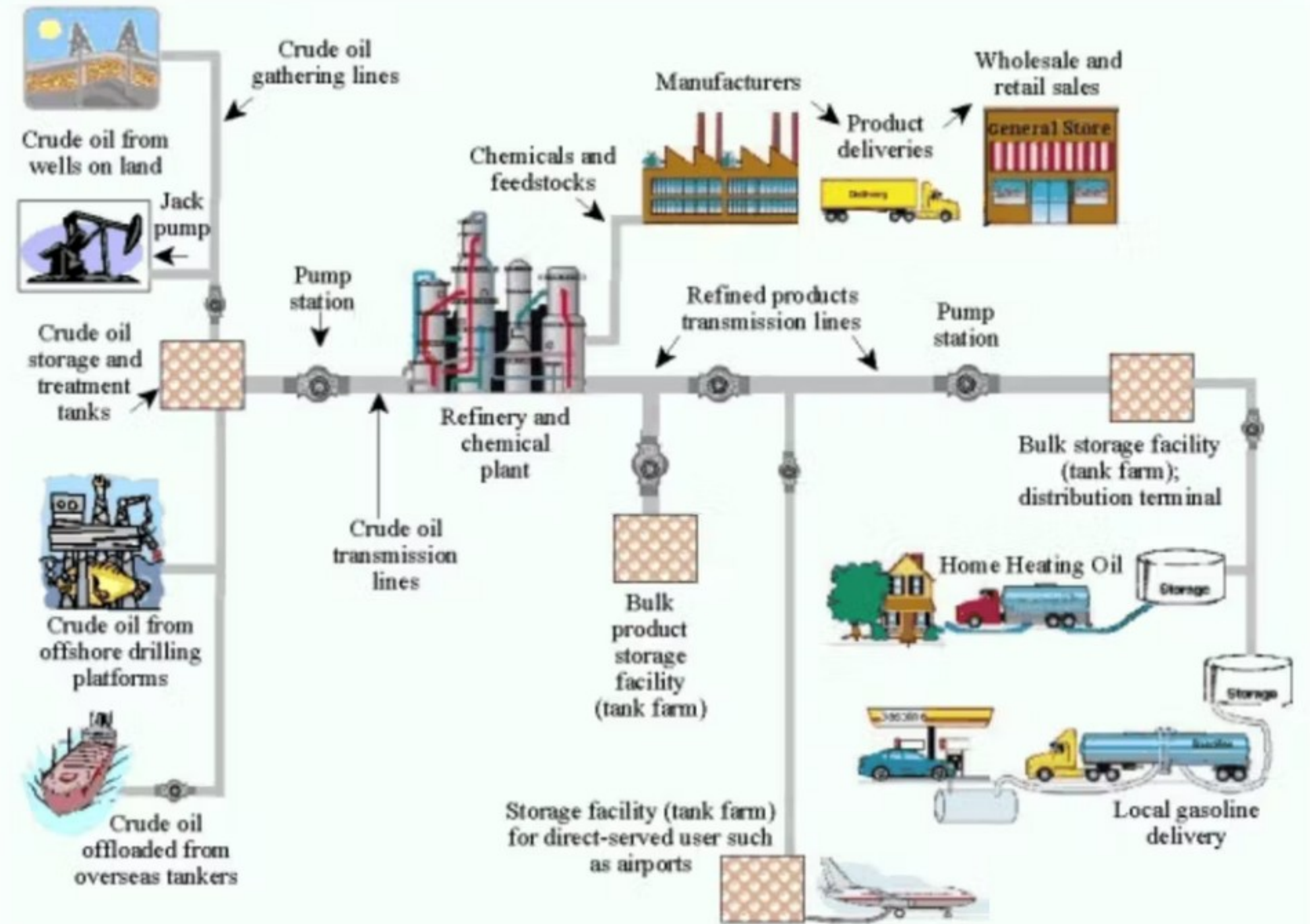
# Types of Pipelines

## ➤ Many different types of pipelines but the focus of this study is transmission pipelines

- **Transmission pipelines:** Liquids and gases from gathering pipelines to refineries, storage facilities, or processing plants.

## ➤ Other types of Pipelines:

- **Gathering pipelines:** Liquids and gases from their sources to refineries, processing plants, or connections with transmission pipelines.
- **Distribution pipelines:** Distribute natural gas to commercial and residential end-users.



Source: U.S. Pipeline and Hazardous Materials Safety Administration



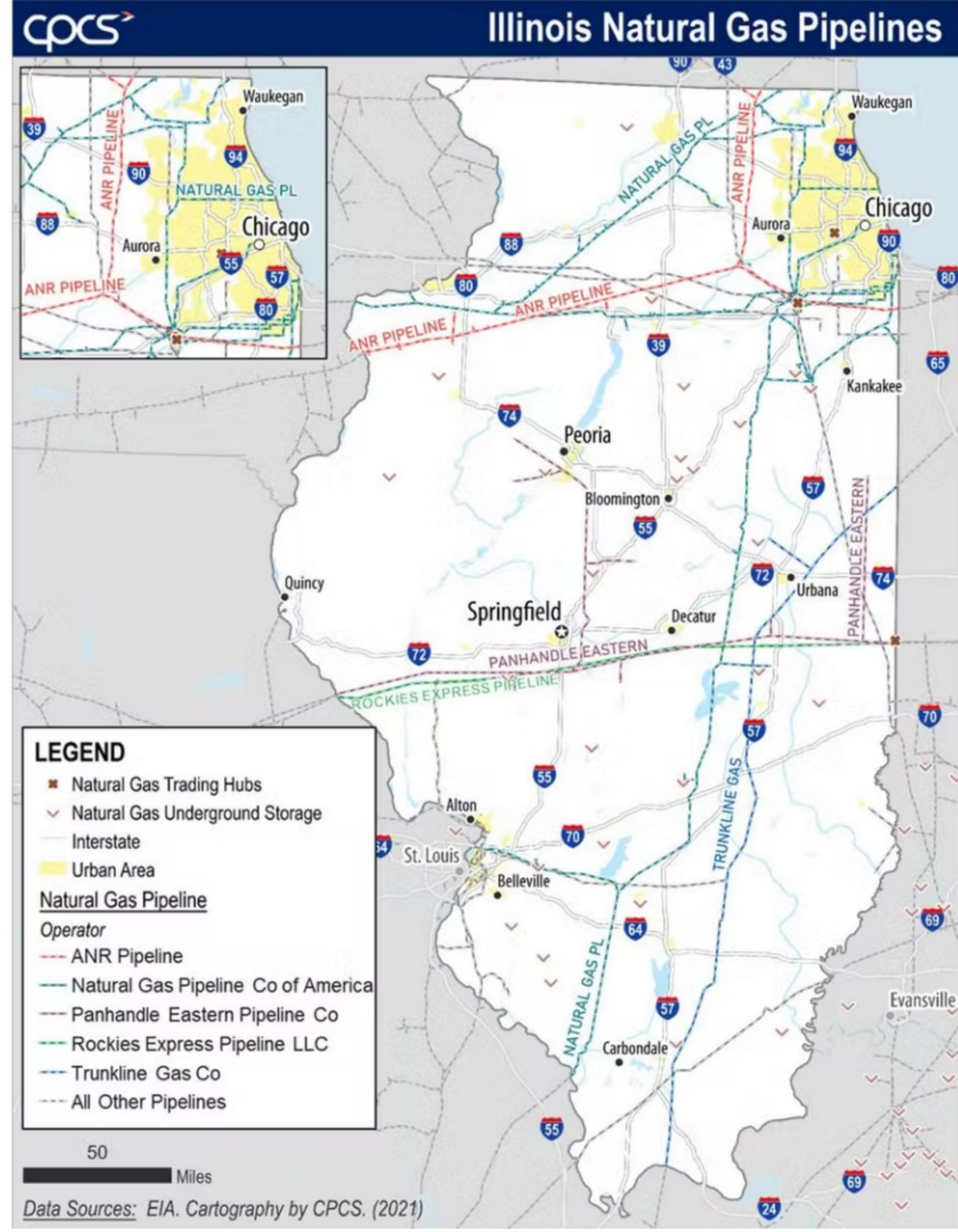
# Natural Gas Pipelines

➤ Very limited natural gas production in Illinois

- Illinois relies on interstate transportation of natural gas
- The Illinois border with Iowa and Missouri transport the largest amounts of natural gas into Illinois for consumption and traveling through the state

➤ Three operators provide service to about 91 percent of customers and operate about 89 percent of distribution pipelines in Illinois

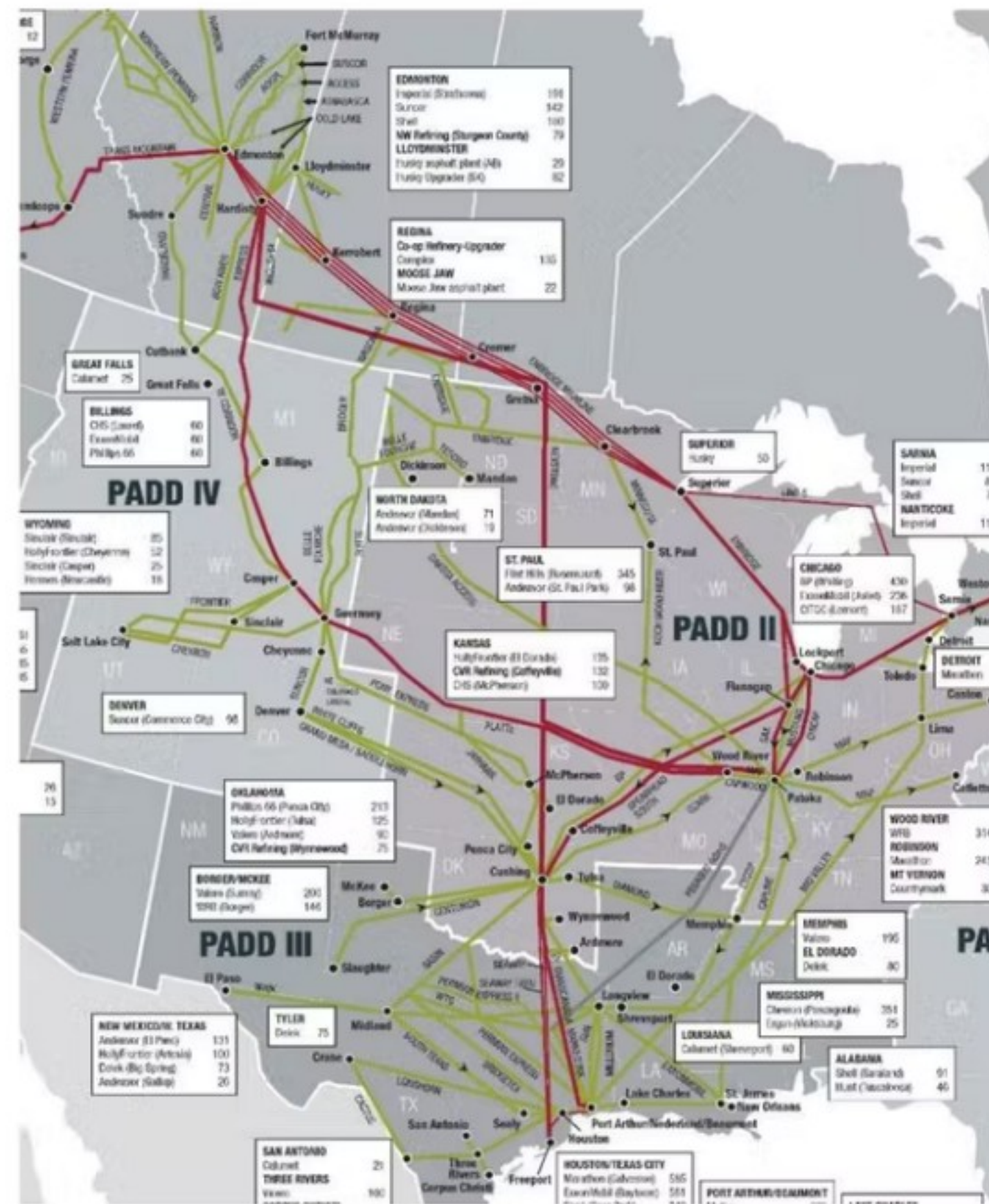
- Ameren Illinois, Northern Illinois Gas, and Peoples Gas Light & Coke Company



# Crude Oil

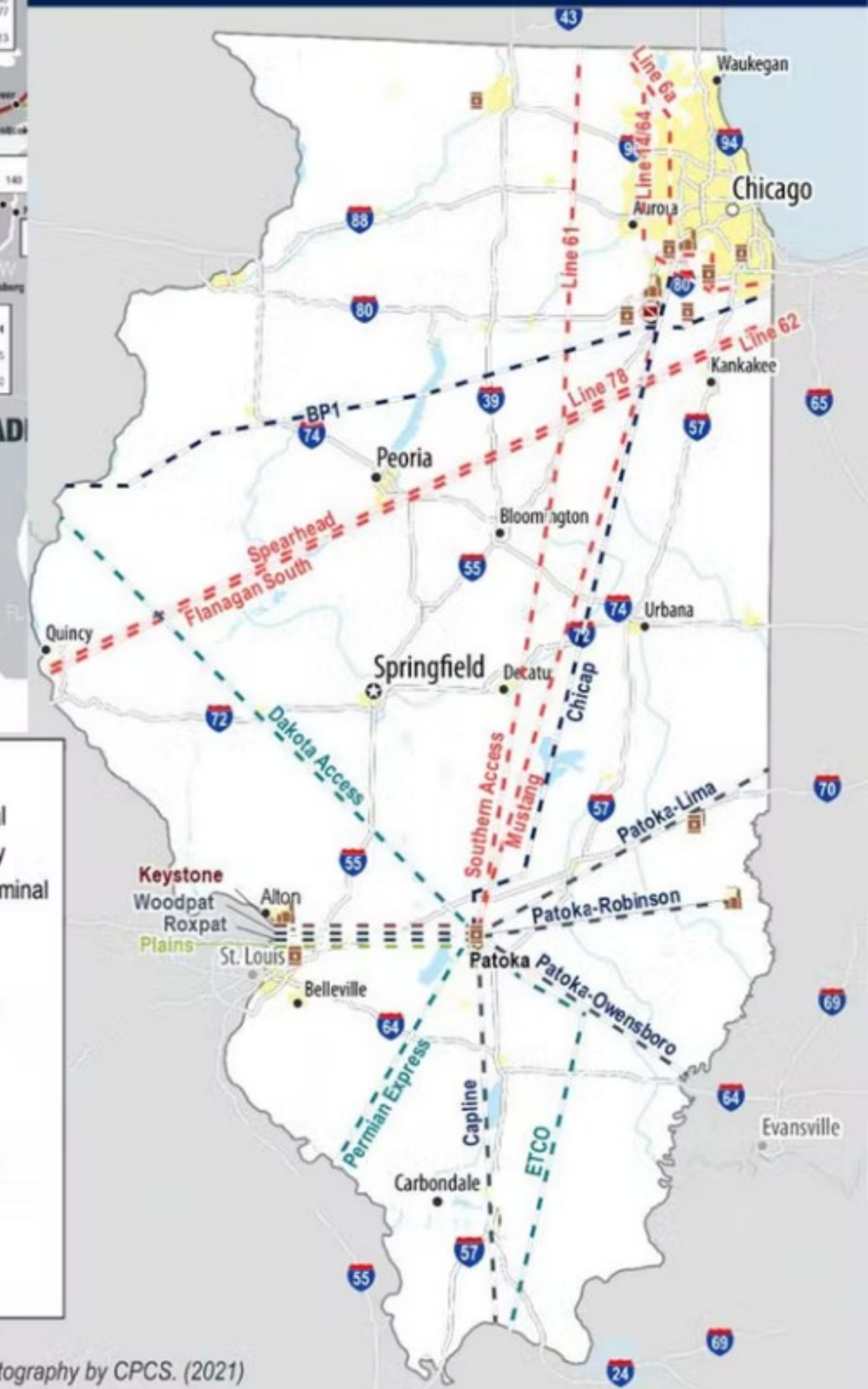
## Crude oil pipeline intensity in Illinois is a function of:

- Geography: Connection to Canadian crude oil imports and domestic fracking
- History: Patoka is the second largest pipeline terminal in the US, served by multiple pipeline operators
- Refining capacity: 5.5% of U.S. refining capacity in Illinois (4<sup>th</sup> in the U.S.) and largest refining capacity in the Midwest



Source: Canadian Association of Petroleum Producers

## Illinois Crude Oil Pipelines



**LEGEND**

- Crude Oil Terminal
- Crude Oil Refinery
- Crude Oil Rail Terminal
- Interstate
- Urban Area
- Crude Oil Pipeline
- Operator
- BP Pipeline
- Enbridge
- Energy Transfer
- Marathon
- Plains All Am.
- TC Energy

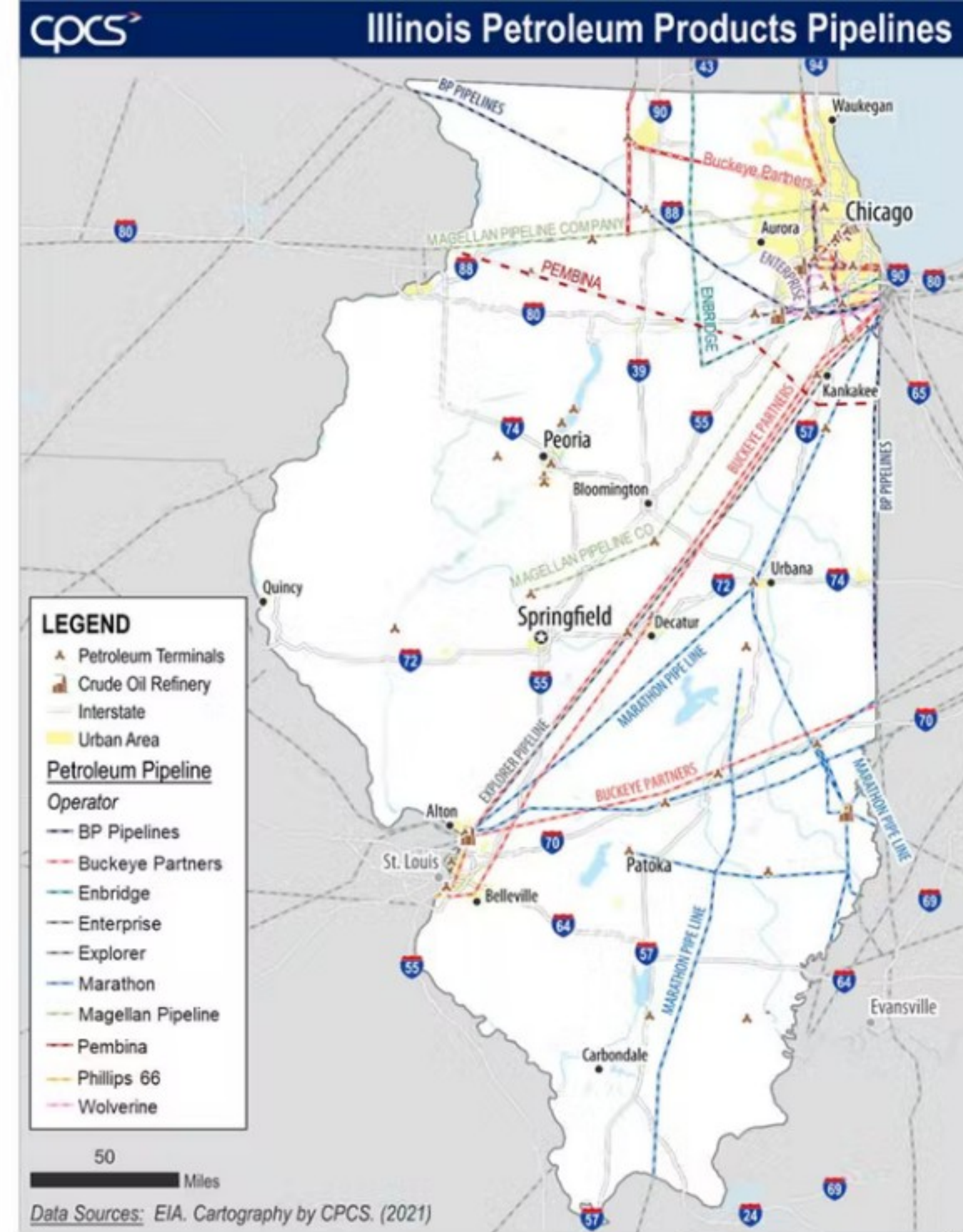
Miles

Data Sources: EIA. Cartography by CPCS. (2021)

# Refined Petroleum Products & Highly Volatile Liquids

## ➤ Two classifications of liquids (non-crude)

- Highly Volatile Liquids (HVL): HVL is a hazardous liquid that forms a vapor cloud when released into the atmosphere – examples include: propane, butane, ethylene
- Non-HVL: Refined petroleum products such as gasoline, diesel, jet fuel, kerosene, heating oil, etc



# Review of Petroleum Terminals

- **Proximity to truck bottlenecks:** 30 out of Illinois' 51 petroleum terminals likely contribute to truck bottlenecks, roadway pavement issues, or both
- **Truck Access:** Access to a terminal and the connections to access routes may not reflect the quantity of trucks and cause impacts to roadway performance, safety, and efficiency
- **Weight Restrictions:** Posted access on connector roadways may result in inefficient routes, traffic, and congestion

## Buckeye Terminal in Summit (SW of Chicago)



Source: Google Maps, 2022 Maxar Technologies, U.S. Geological Survey



Source: Google Street View

# Resilience of Illinois Pipeline System

- Illinois's crude oil pipelines have multiple times the capacity that Illinois refineries need to operate at maximum capacity and have major pipeline hubs in the region
- Most of Illinois's refineries (Lemont, Joliet, and Wood River) are directly served by several crude oil pipelines and refineries can reduce production if needed
- Illinois has many product pipelines inbound and outbound and refinery capacity in Illinois exceeds consumption
  - Disruptions resulted in longer truck trips, different origin/destination pairs, and a potential to impact performance on connecting roadway

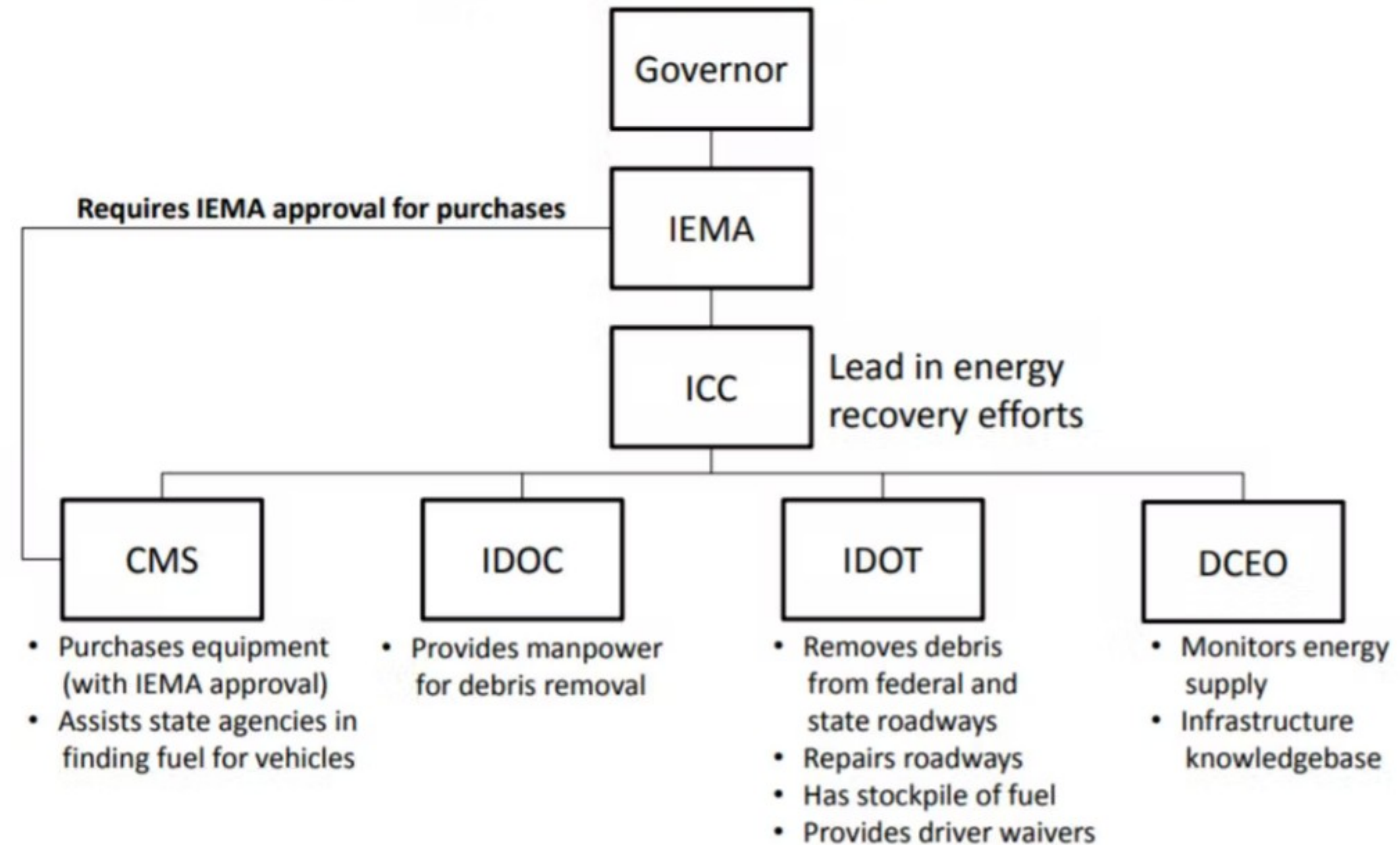
Net Crude Oil Input in PADD 2 during Keystone Pipeline Outage



# IDOT's Existing Role in Pipeline Planning and Oversight

- **Right-of-Way Coordination:** Approve utility permits for pipeline construction proposed within the roadway right-of-way
- **Emergency Response:** The 2015 State of Illinois Energy Assurance Plan and the 2021 Illinois Emergency Operations Plan (IEOP) identifies IDOT's role in mitigating the impacts of a fuel shortage in areas affected by a disaster

Energy Emergency Response Hierarchy and Responsibilities



Source: 2015 State of Illinois Energy Assurance Plan

# Opportunities for IDOT's Future Role

- Identify and integrate IDOT pipeline activities into existing planning, operations, and resilience efforts
- Integrate pipelines into the Illinois State Freight Plan
- Integrate pipeline-related facilities into last-mile freight planning

Illinois State Freight Plan Executive Summary  
JUNE 2018

Illinois serves as one of the nation's premier logistics hubs because of its strategic location and access to multimodal transportation infrastructure.

15,968	10,000	1,095	116	1.23	\$2.97
Miles of Roadway	Miles of Tracks	Miles of Navigable Inland Waterways	Airports	Billion Tons Combined Total Freight*	Trillion in Freight Value



Illinois ranked third in truck freight tonnage even though its truck mode share of 54 percent is well below a national average closer to 80 percent due to large volumes of freight also being moved by rail, water, and air. Illinois is the third largest state in the nation for volume of freight, whether measured by tonnage or by value of goods.<sup>1</sup>

Illinois Department of Transportation

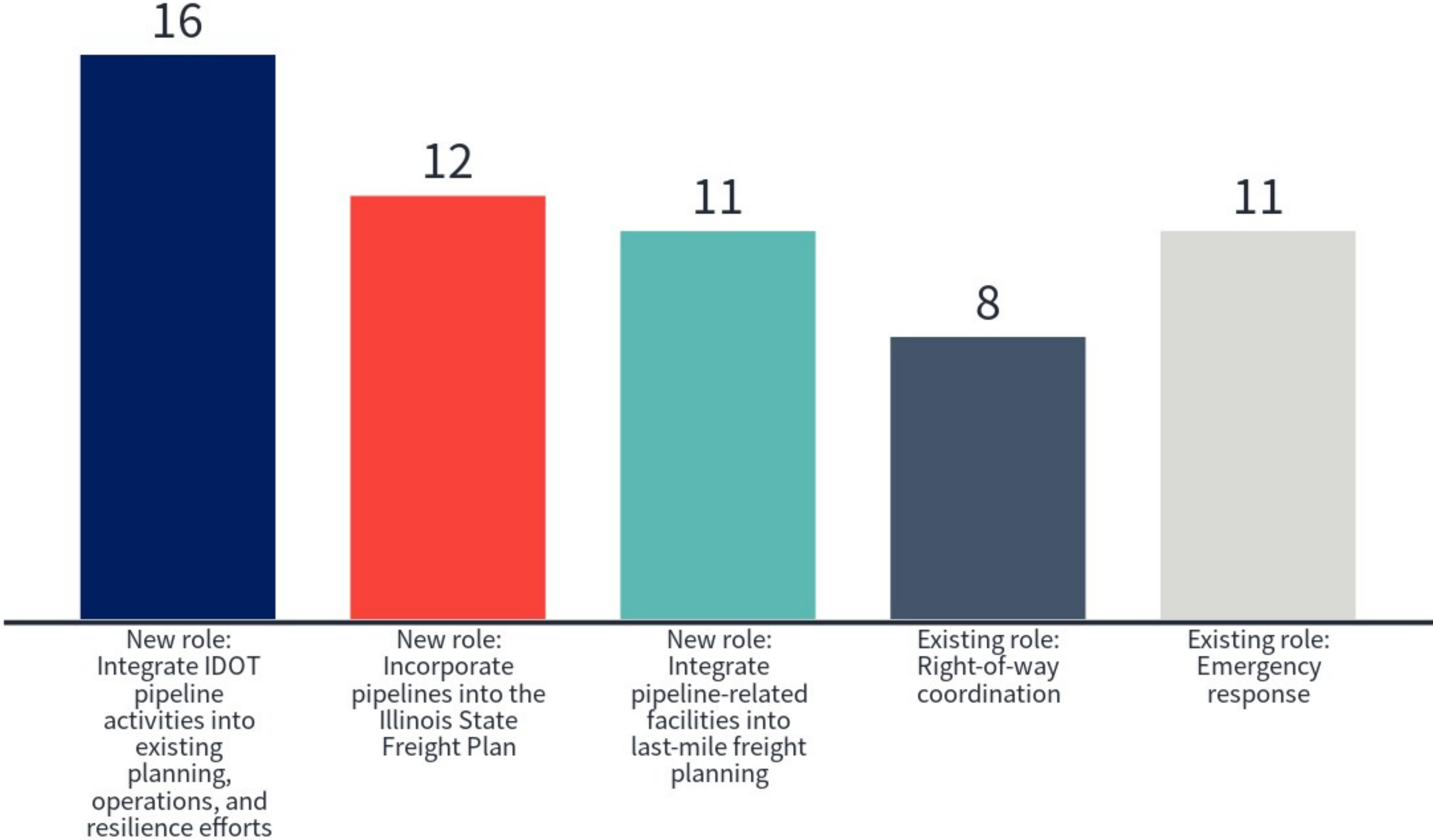
Illinois Emergency Operations Plan Base Plan

Illinois Emergency Management Agency

October 2021



# What role(s) in the pipeline system should IDOT undertake? Select all that apply







Thank You!