



Illinois Pipeline Study

for Illinois Department of Transportation



Illinois State Freight Advisory Council

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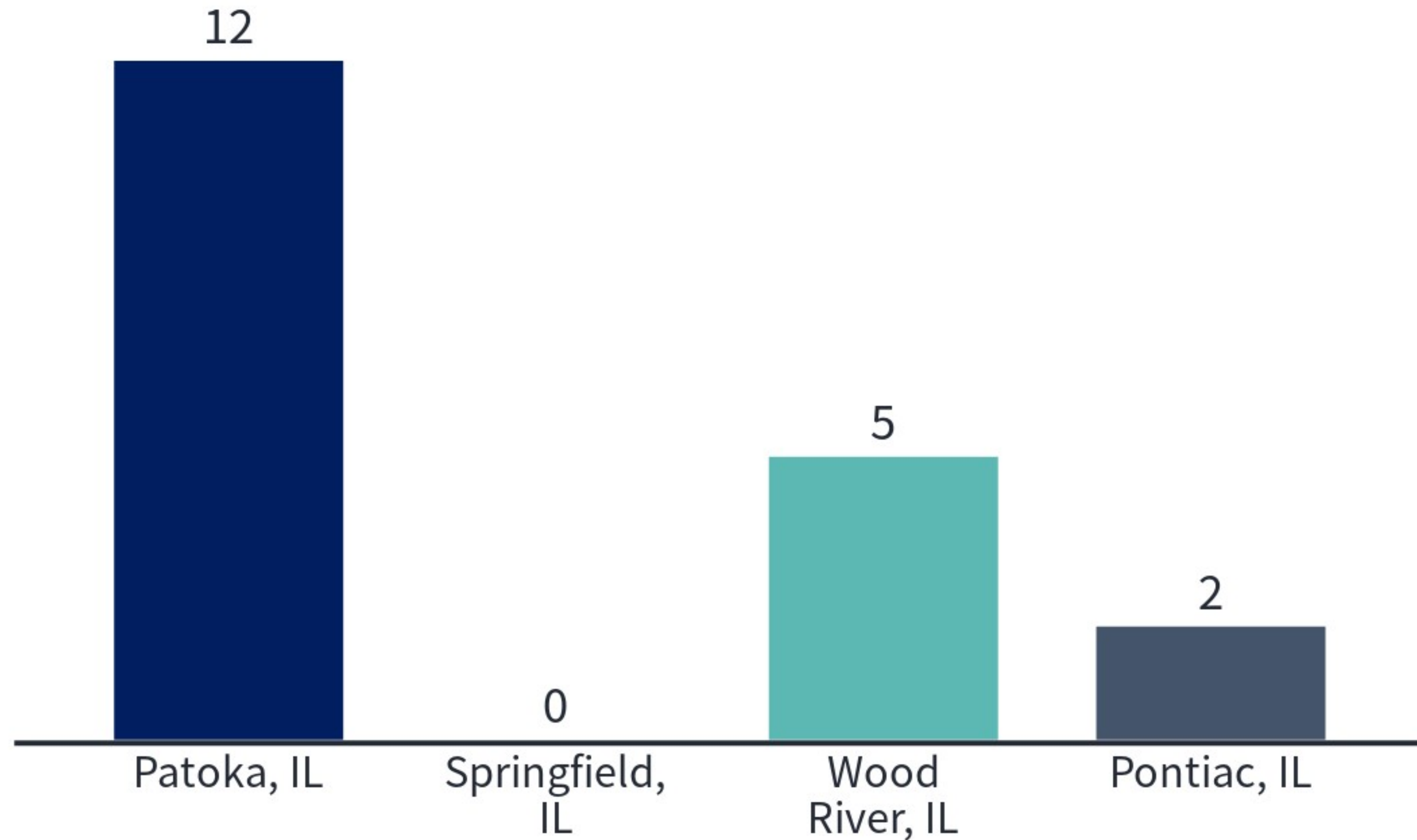


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Where is the 2nd largest crude oil terminal in the U.S. located?





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

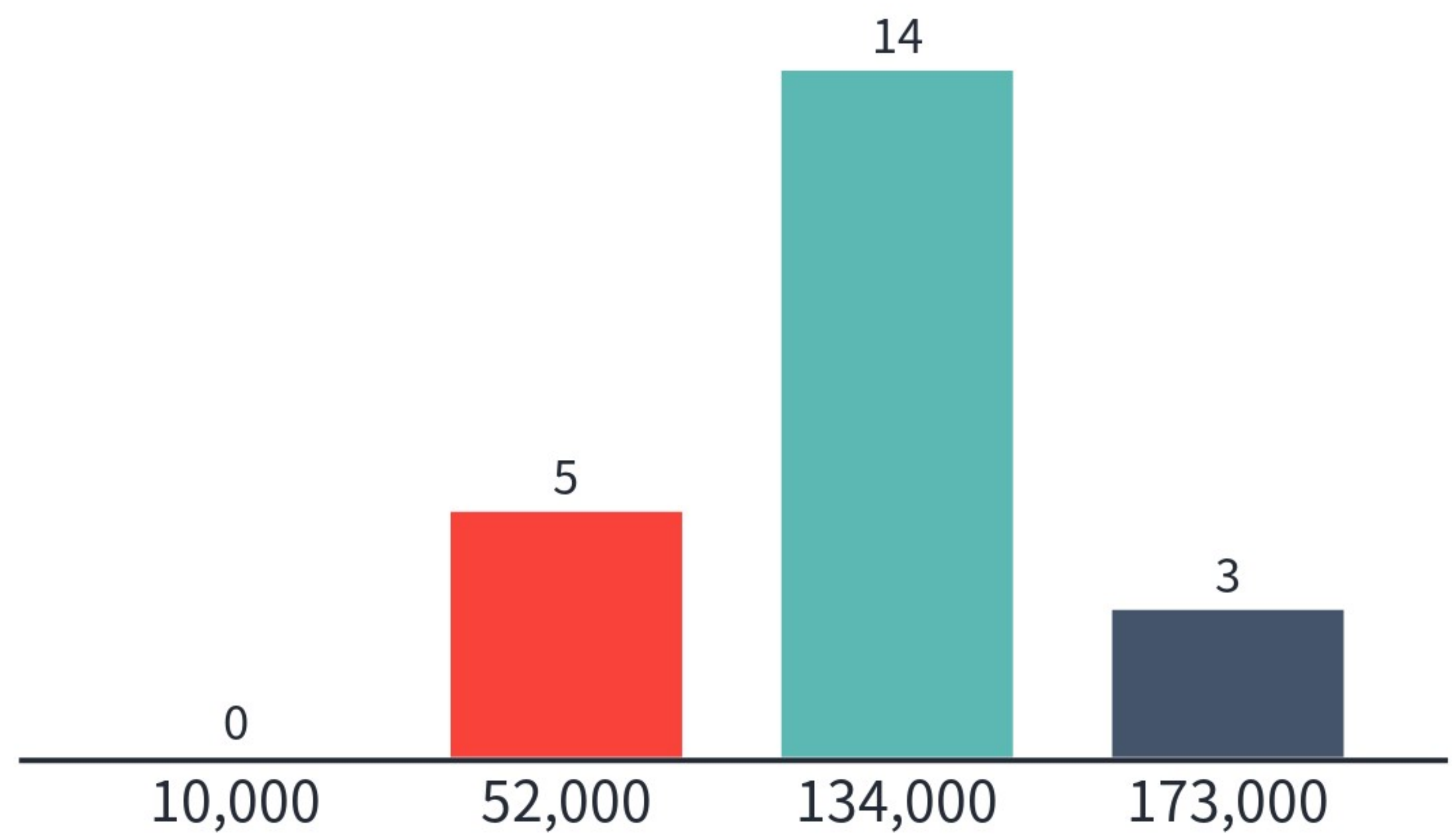
Total capacity: >19 million barrels

Connecting pipelines: 12 active pipelines

Crude oil sources: Bakken, Canada, US Gulf Coast

Source: Dakota Pipeline facts, 2019

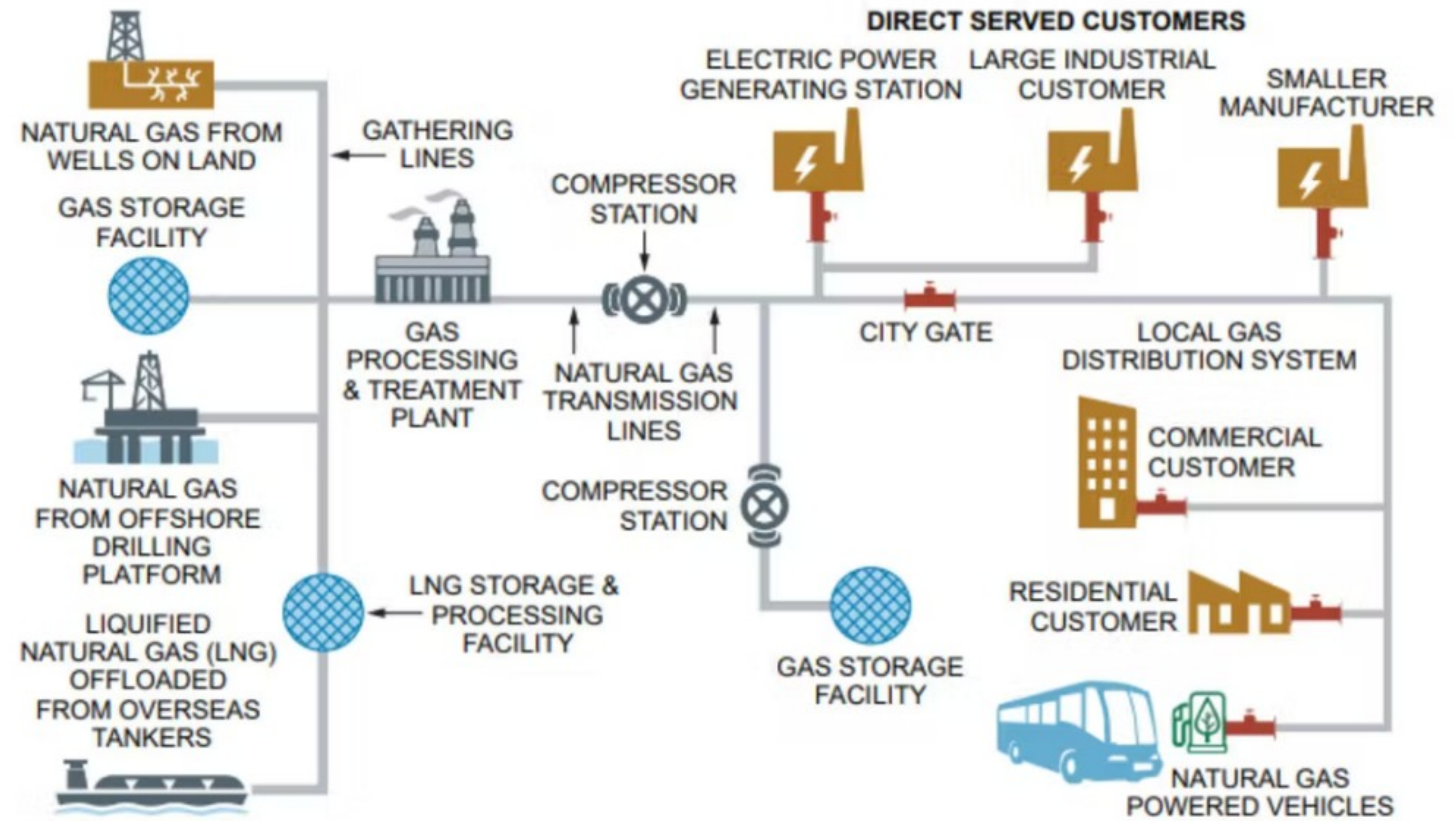
What is the total number of pipeline miles located in Illinois?



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
- 4th 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



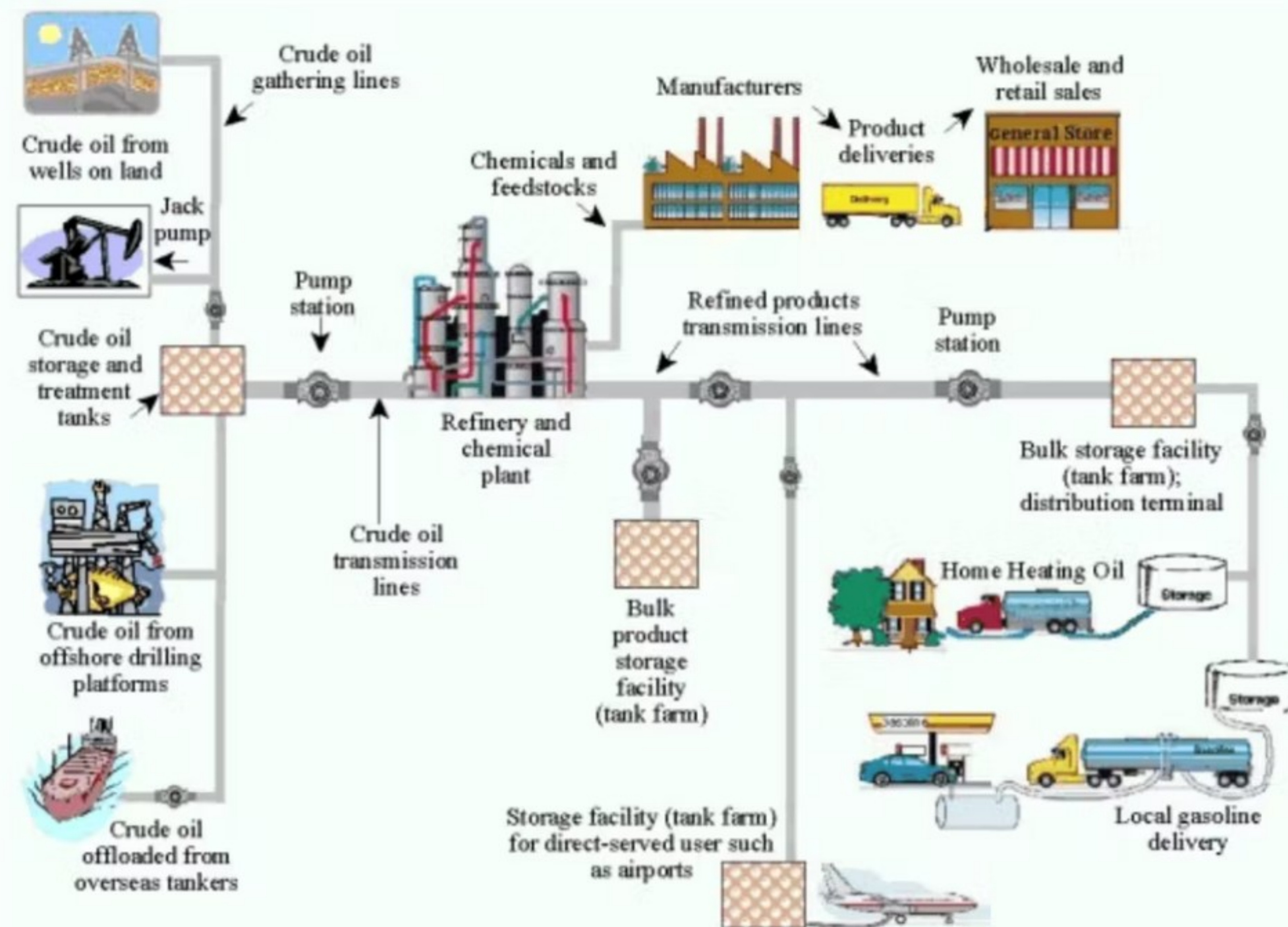
Types of Pipelines

➤ 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.

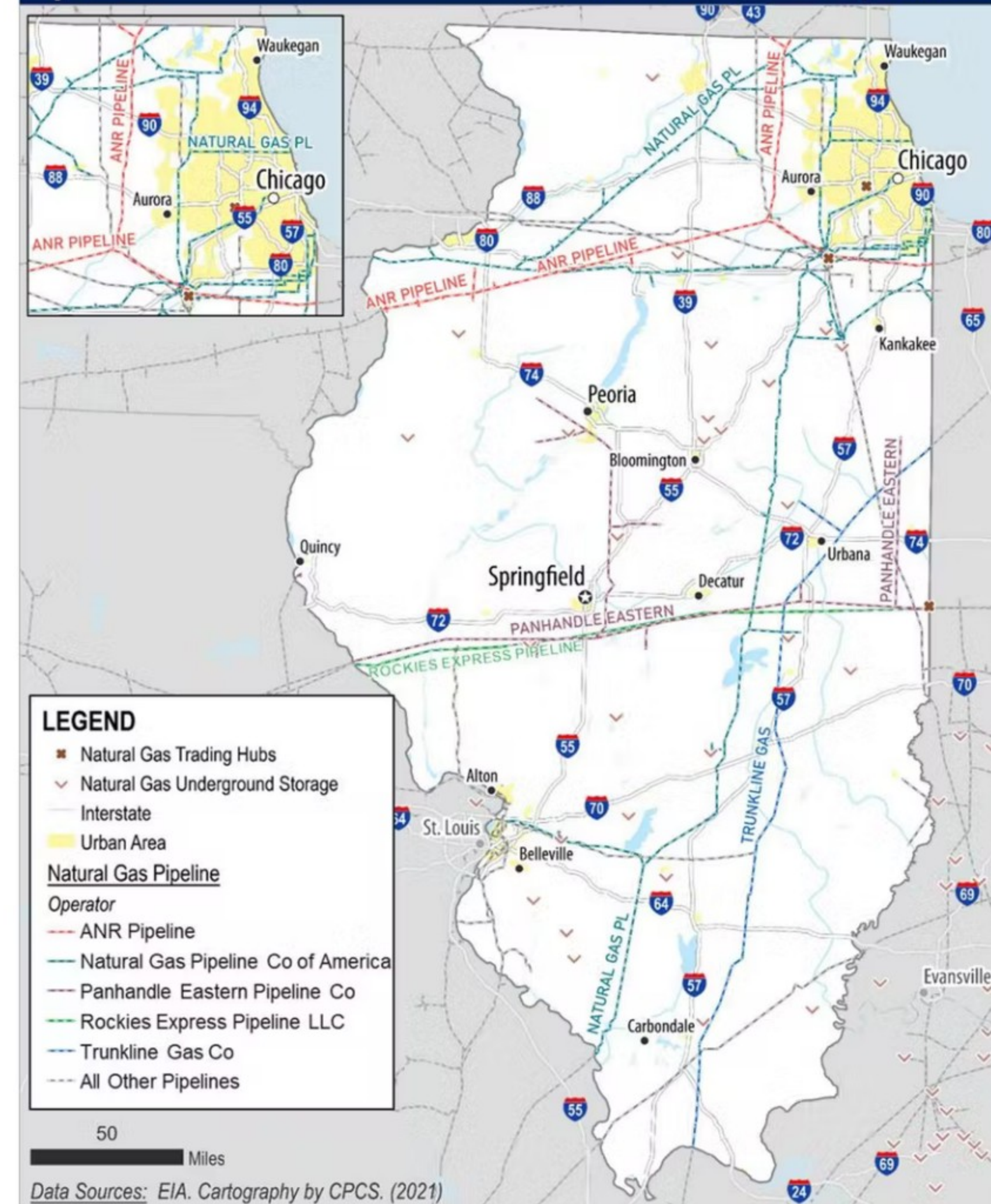


Source: U.S. Pipeline and Hazardous Materials Safety Administration



Natural Gas Pipelines

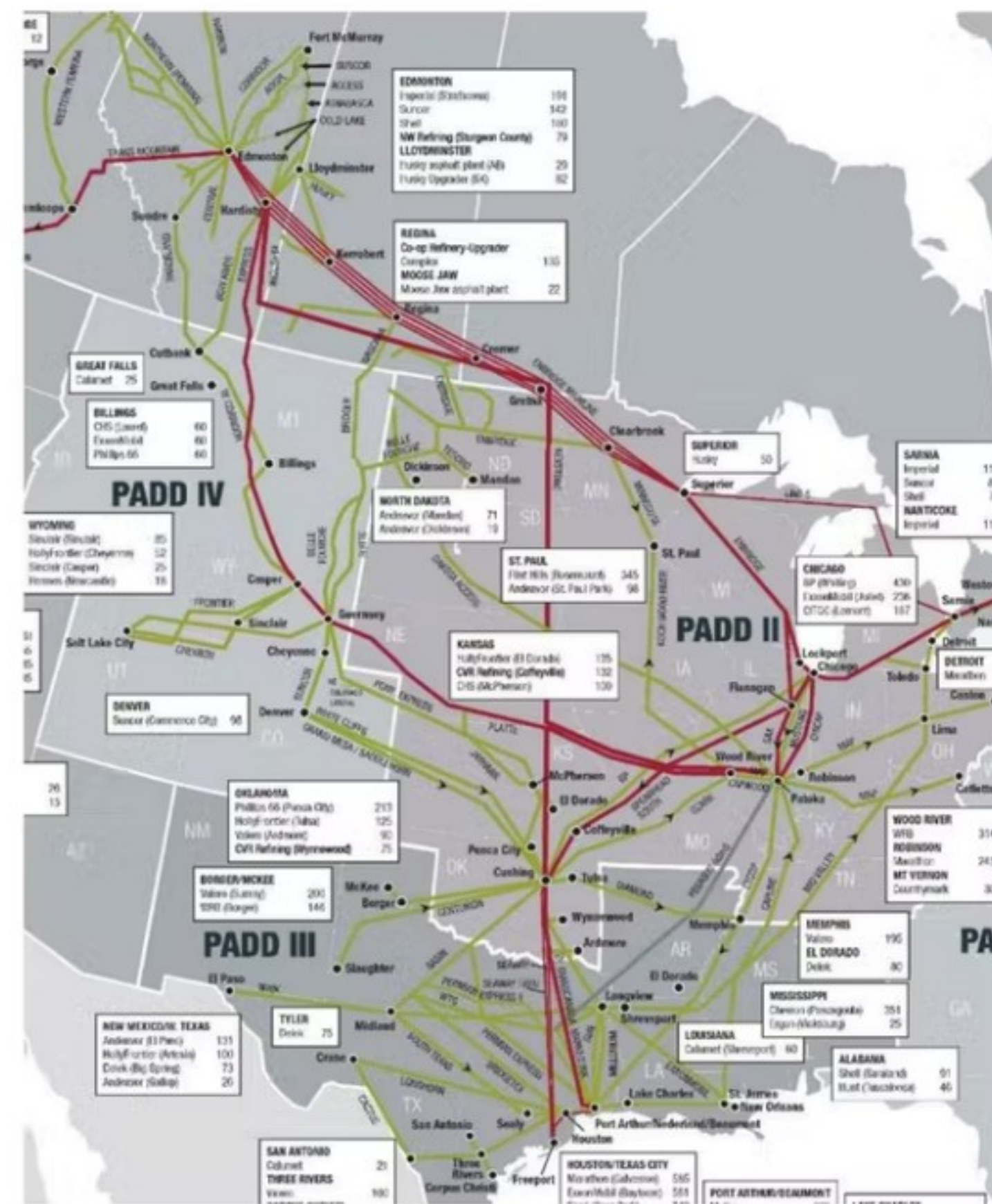
- Very limited natural gas production in Illinois
 - Illinois relies on interstate transportation of natural gas
 - The Illinois border with Iowa and Missouri transport the largest amounts of natural gas into Illinois for consumption and traveling through the state
- Three operators provide service to 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

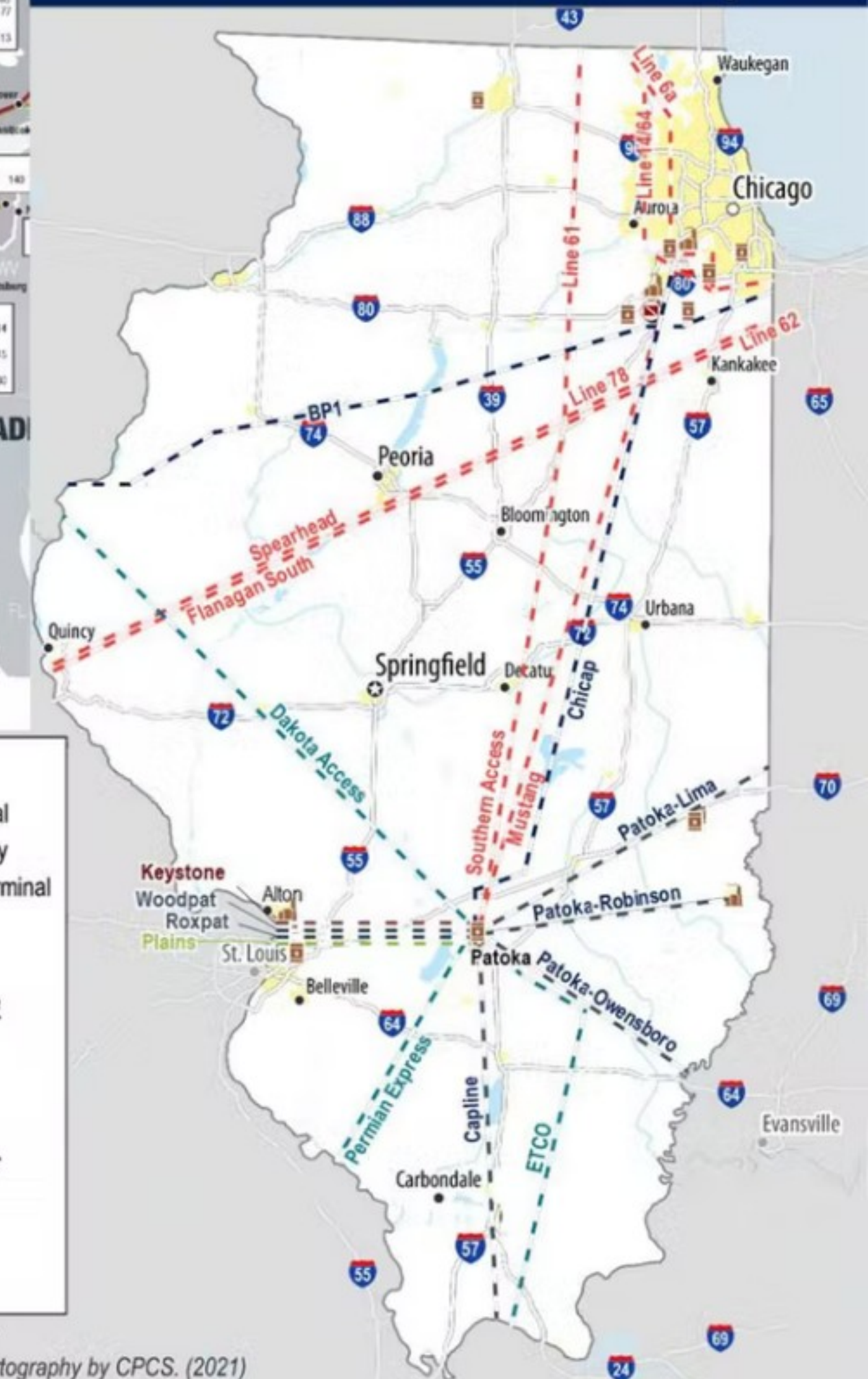
Crude oil pipeline intensity in Illinois is a function of:

- 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 (4th in the U.S.) and largest refining capacity in the Midwest



Source: Canadian Association of Petroleum Producers

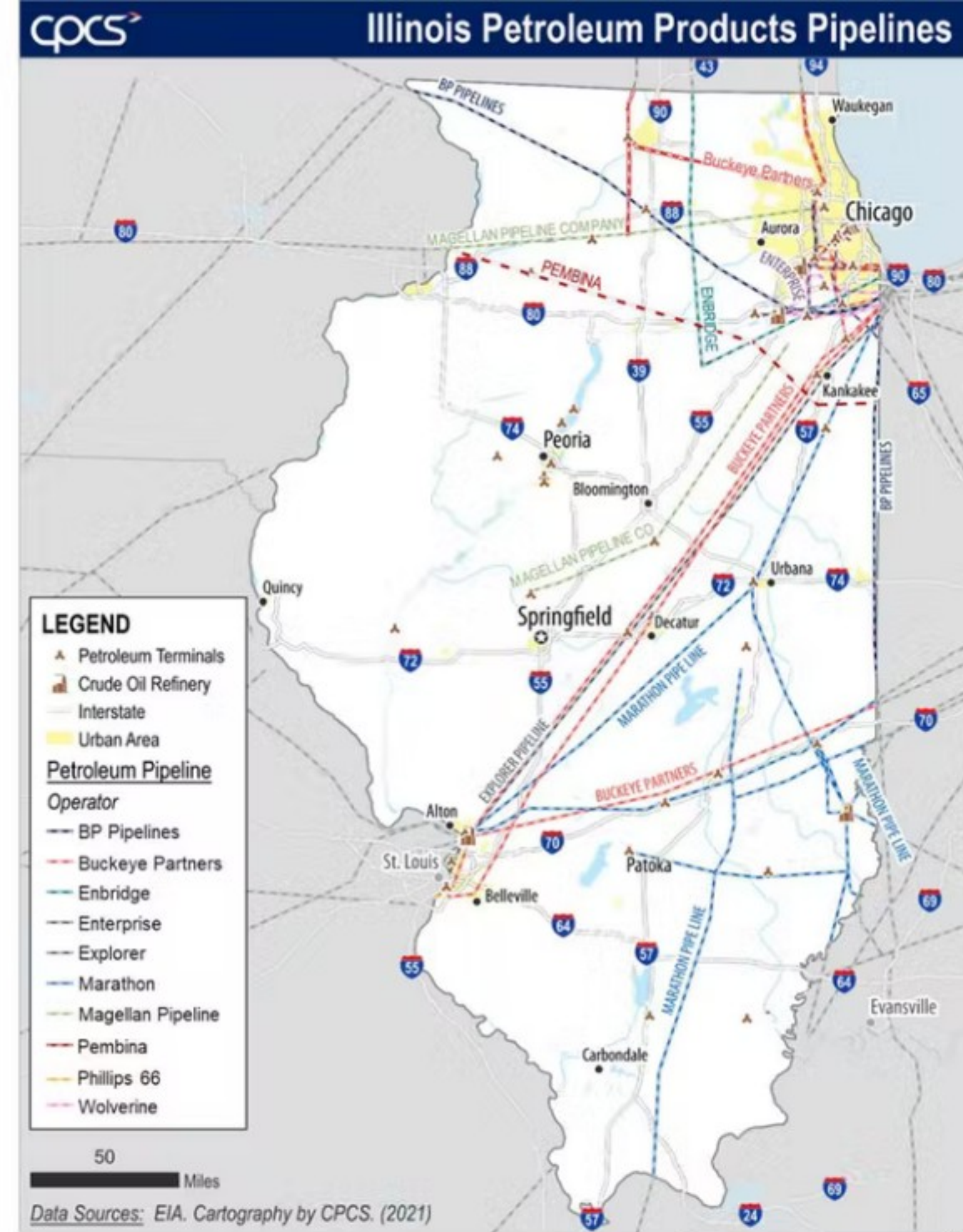
Illinois Crude Oil Pipelines



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

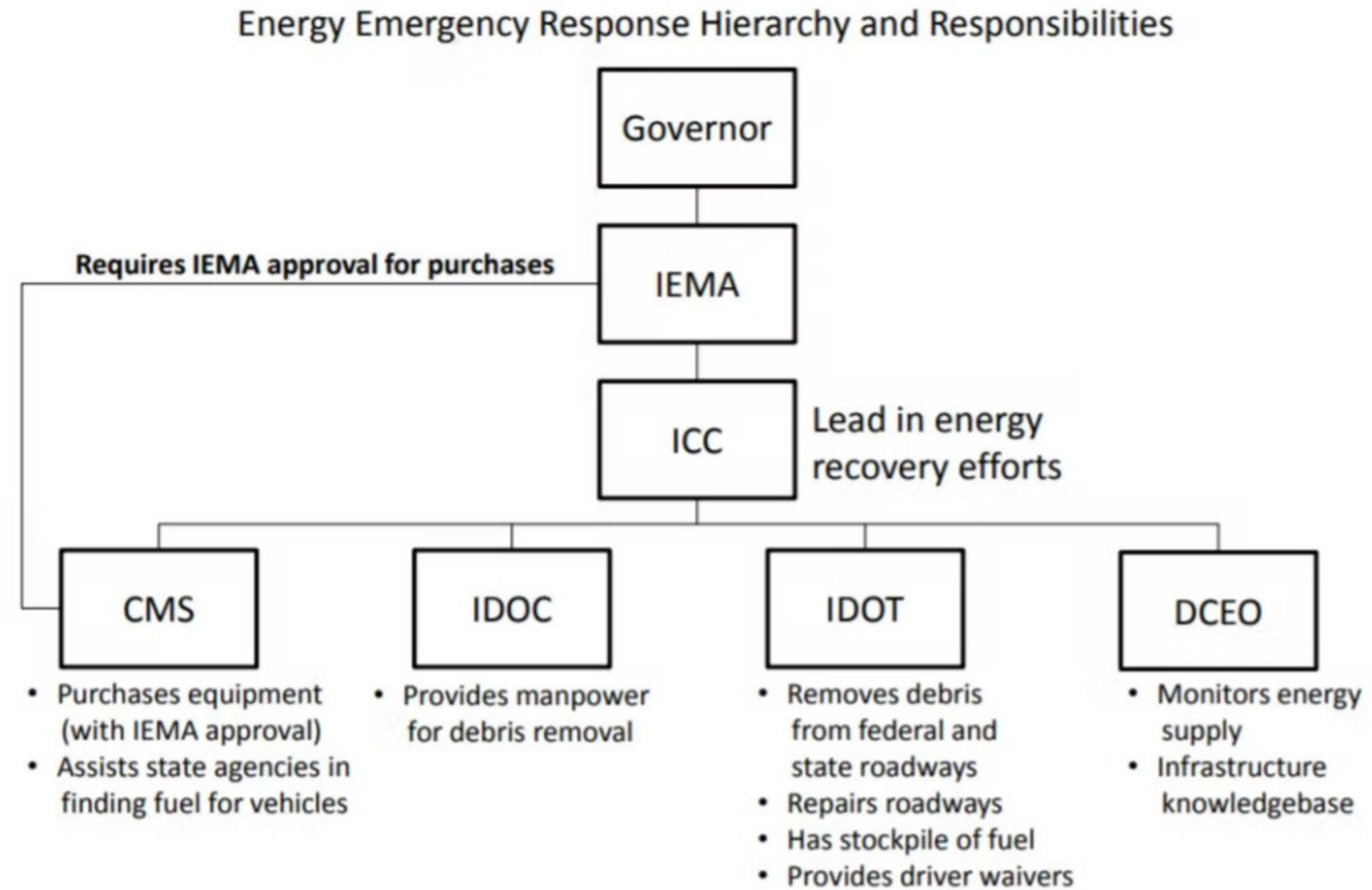
- Illinois's crude oil pipelines have multiple times the capacity that Illinois refineries need to operate at maximum capacity and have major pipeline hubs in the region
- Most of Illinois's refineries (Lemont, Joliet, and Wood River) are directly served by several crude oil pipelines and refineries 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

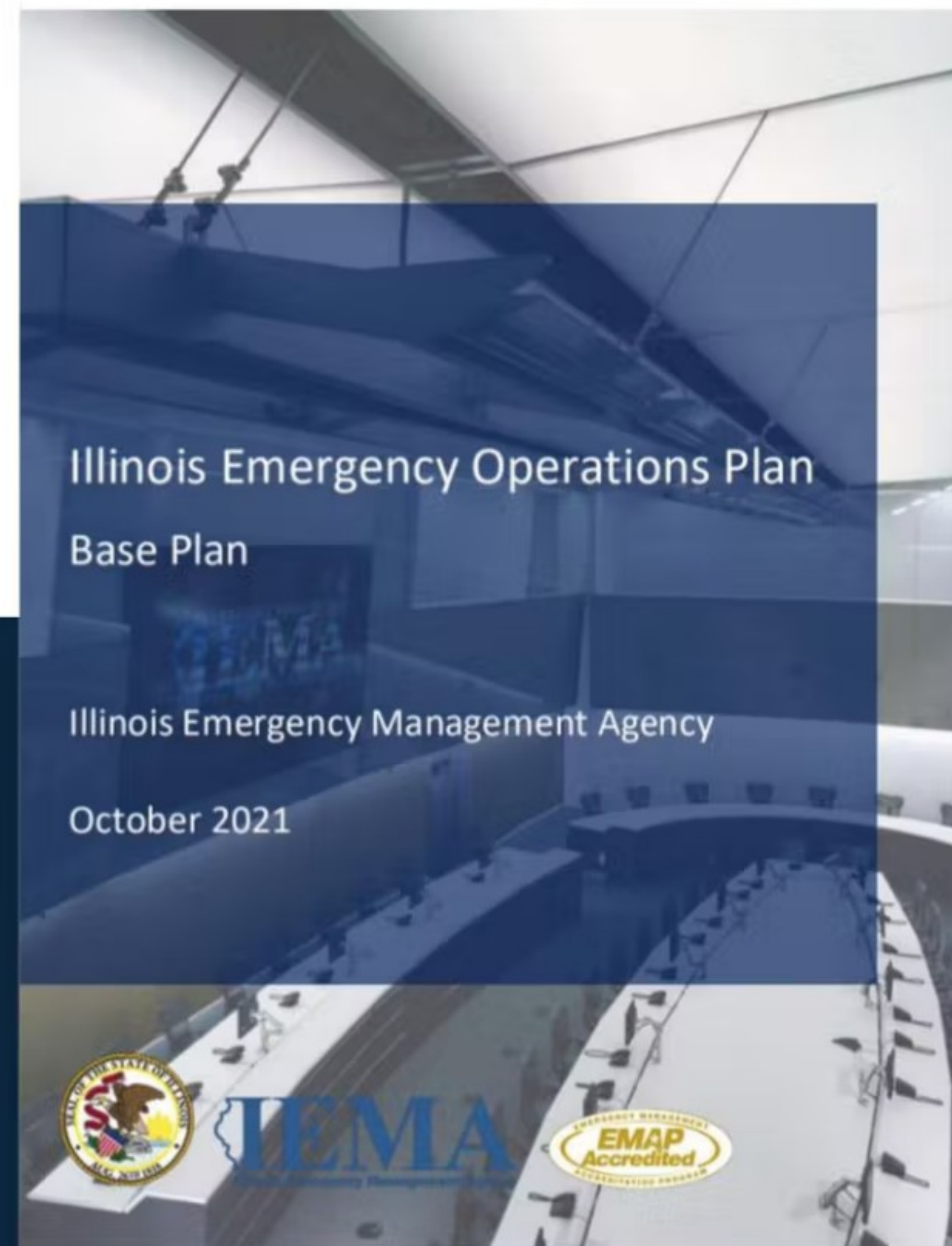
- **Right-of-Way Coordination:** Approve utility permits for pipeline construction proposed within the roadway right-of-way
- **Emergency Response:** The 2015 State of Illinois Energy Assurance Plan and the 2021 Illinois Emergency Operations Plan (IEOP) identifies IDOT's role in mitigating the impacts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



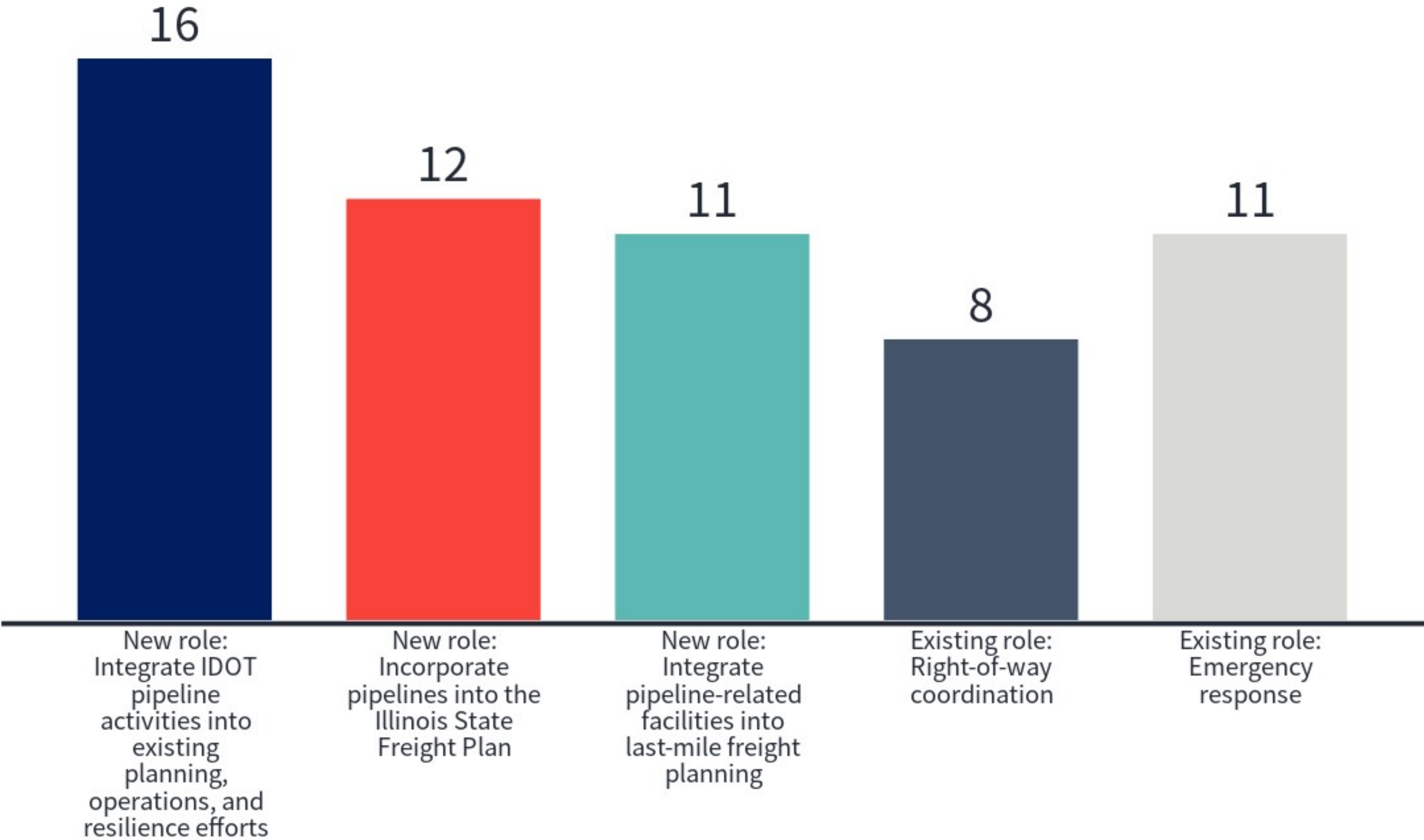
Source: 2015 State of Illinois Energy Assurance Plan

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



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





Thank You!