

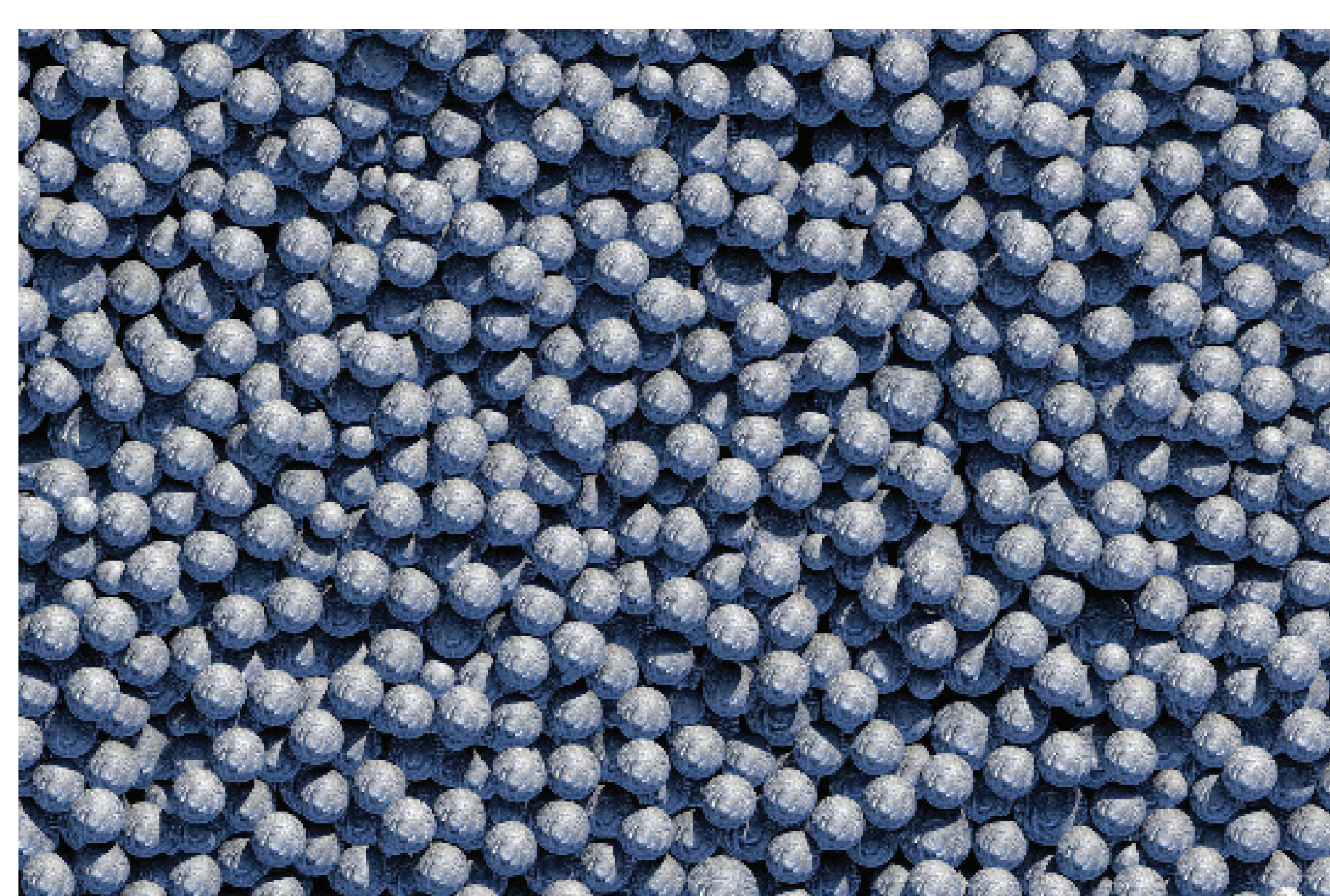


# Flow-Channel Hydraulic Fracturing Service

Since 2010, the HiWAY\* flow-channel hydraulic fracturing service has helped operators increase production while using less water and proppant. The first technique of its kind, the HiWAY fracturing service creates stable channels within the fractures—decoupling fracture conductivity from the proppant pack. This results in infinite fracture conductivity.

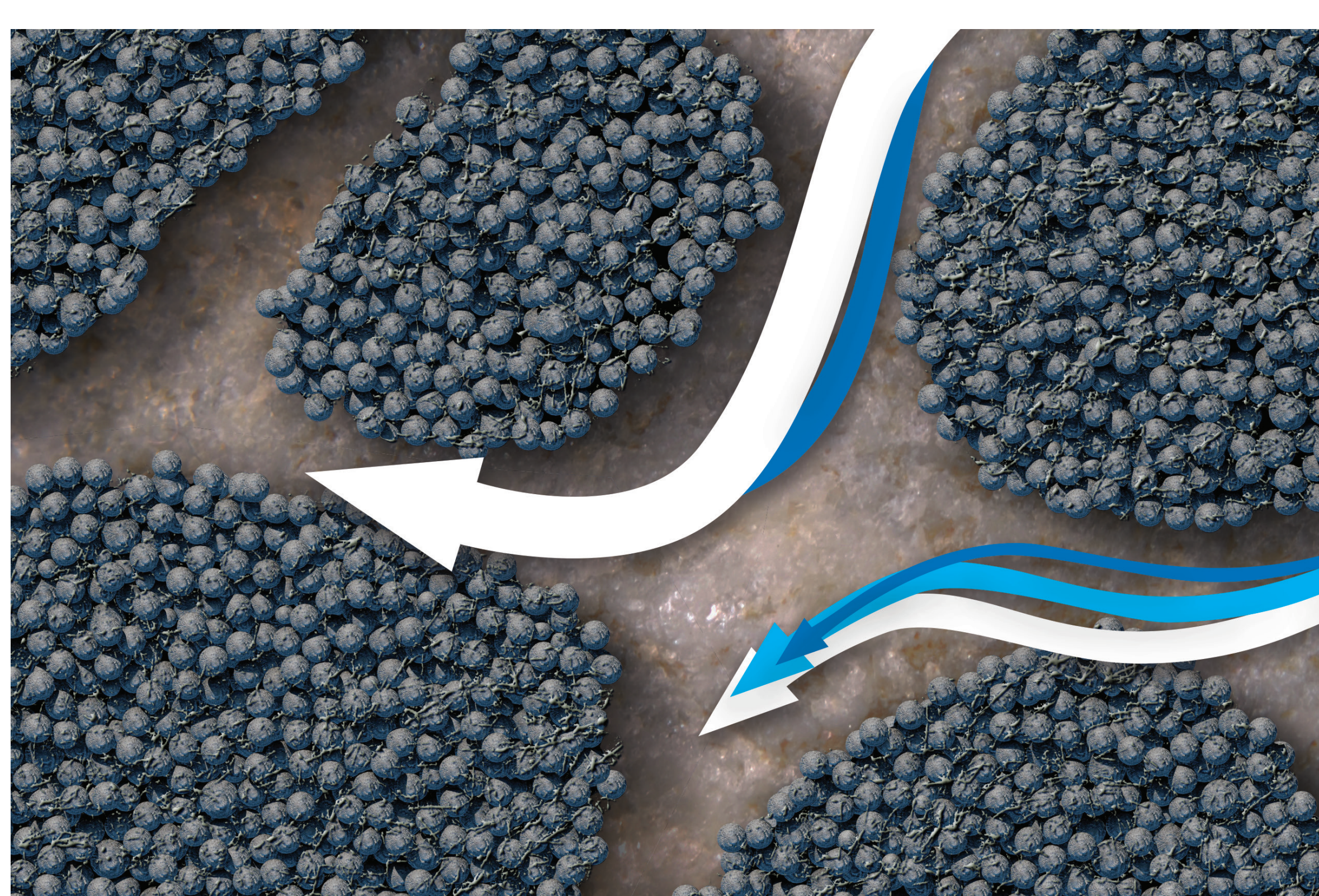
“Petrohawk has converted 100% of frac services provided by Schlumberger in the Eagle Ford to the HiWAY technique.”

**Dick Stoneburner,**  
COO and President, Petrohawk



## Conventional hydraulic fracturing

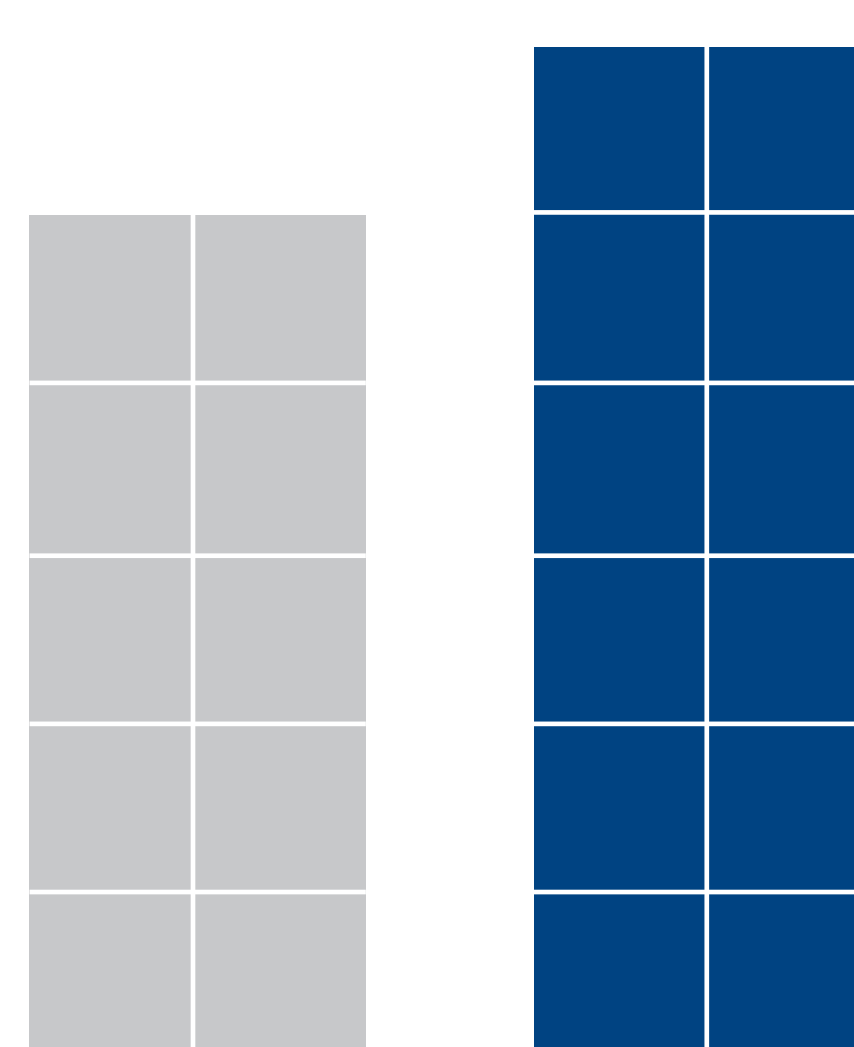
Conventional hydraulic fracturing methods rely on larger proppant sizes and resin coating to improve conductivity.



## HiWAY flow-channel fracturing

The HiWAY service uses specialized blending equipment and control systems to pump proppant in pulses—creating stable, infinite-conductivity flow channels within the fractures.

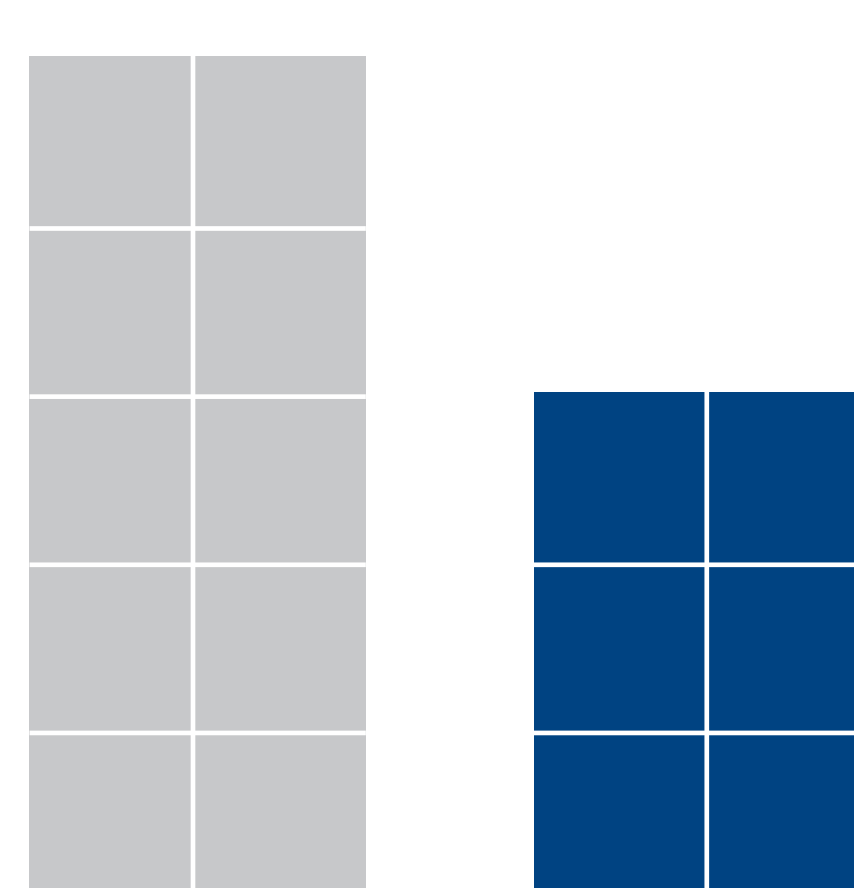
The average HiWAY channel fracturing job **increases production by more than 20%.**



### PRODUCTION

↑ **20%**  
INCREASE

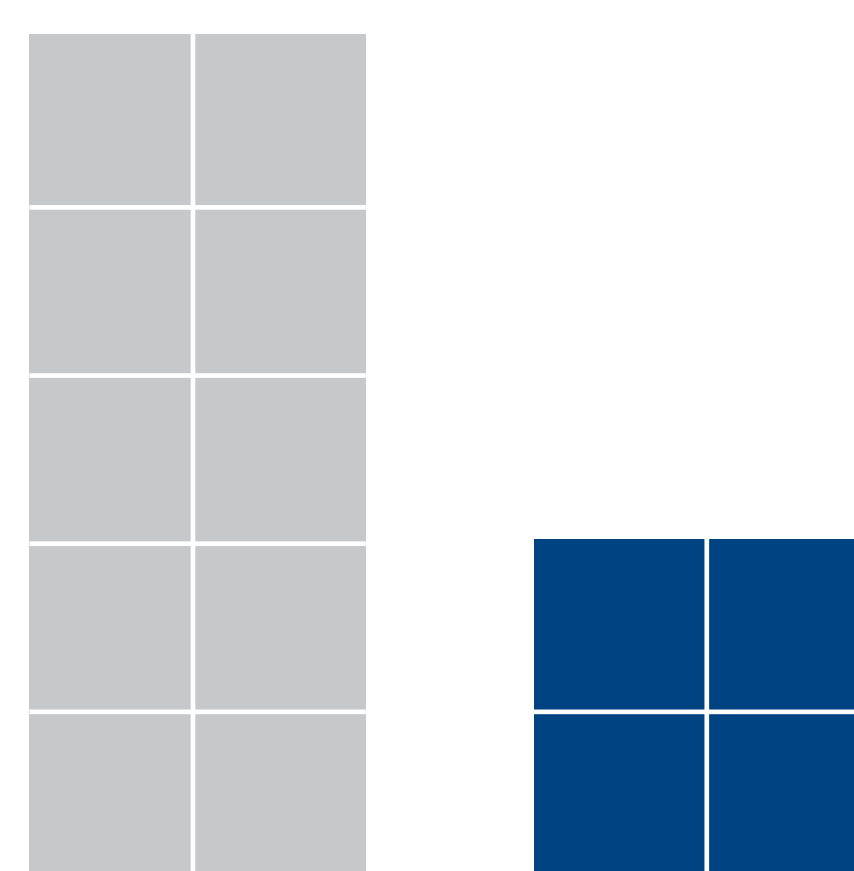
On average, the HiWAY service helps operators **use 40% less proppant per job.**



### PROPPANT

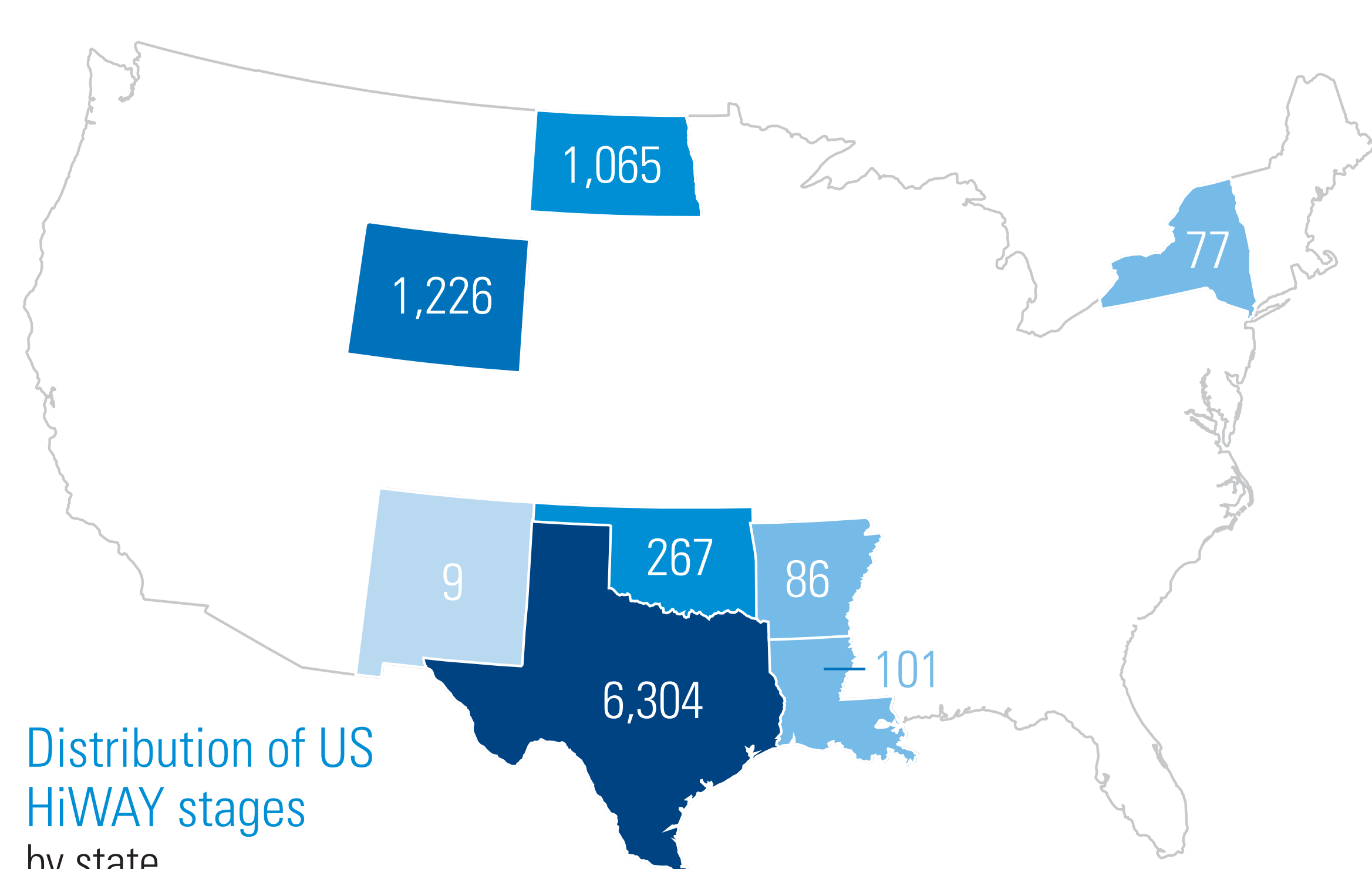
↓ **40%**  
DECREASE

Compared to slickwater treatments, the HiWAY service **uses up to 60% less water.**



### WATER

↓ **60%**  
DECREASE



**10,000+** stages

**80+** customers

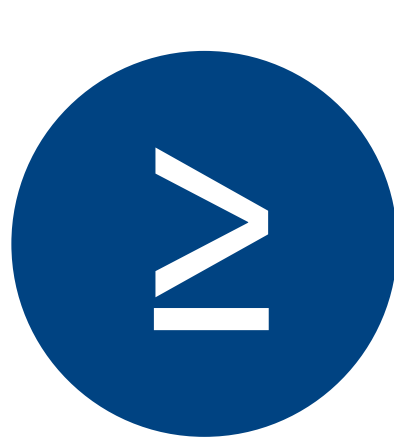
**15** countries



The implementation of **the HiWAY service** has prevented:

12 million pounds  
of CO<sub>2</sub> emissions

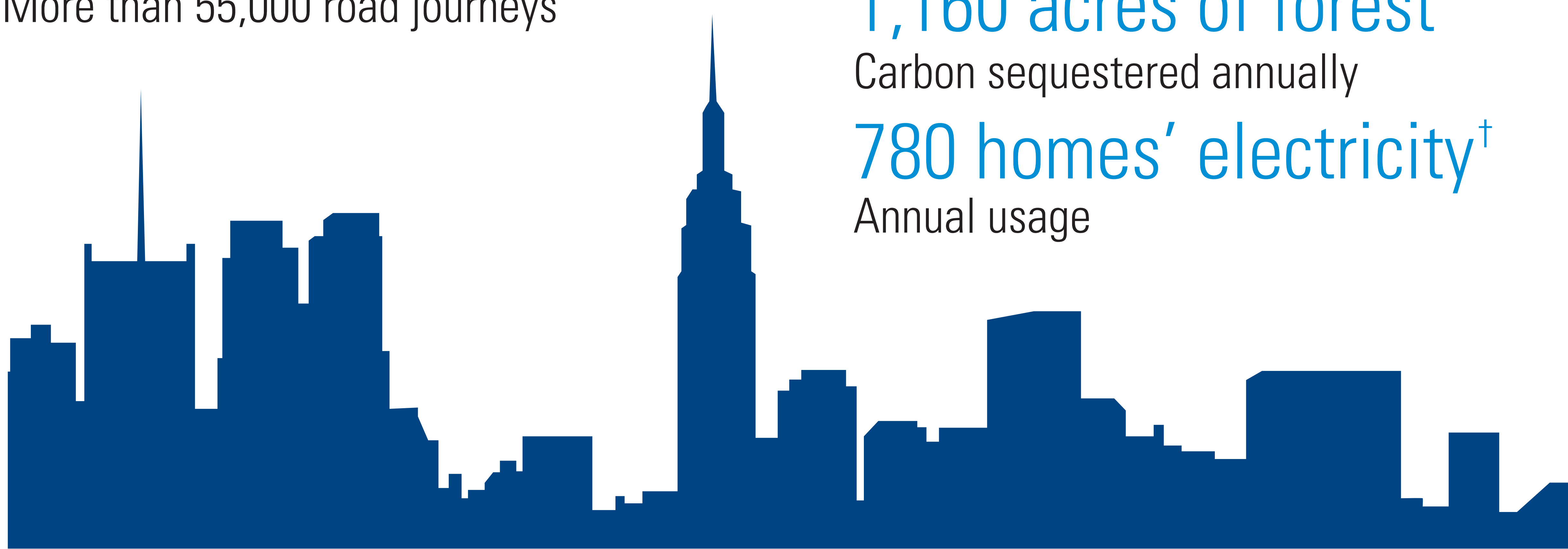
More than 55,000 road journeys



CO<sub>2</sub> emissions equivalent to:  
140,000 planted seedlings<sup>†</sup>  
Carbon sequestered after 10 years

1,160 acres of forest<sup>†</sup>  
Carbon sequestered annually

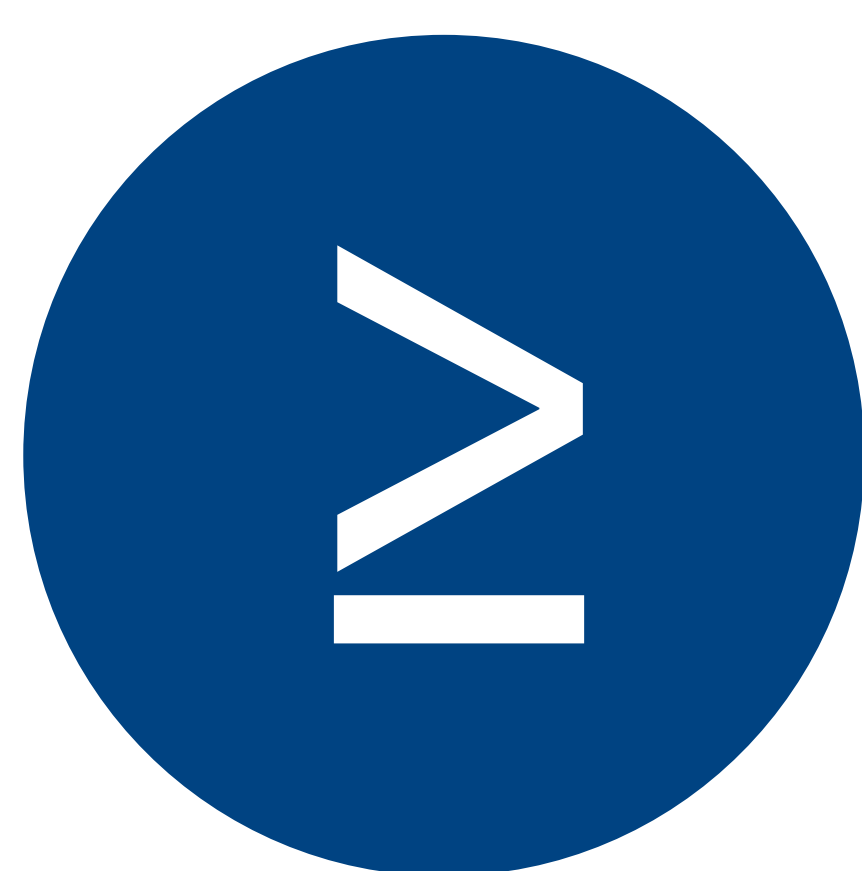
780 homes' electricity<sup>†</sup>  
Annual usage



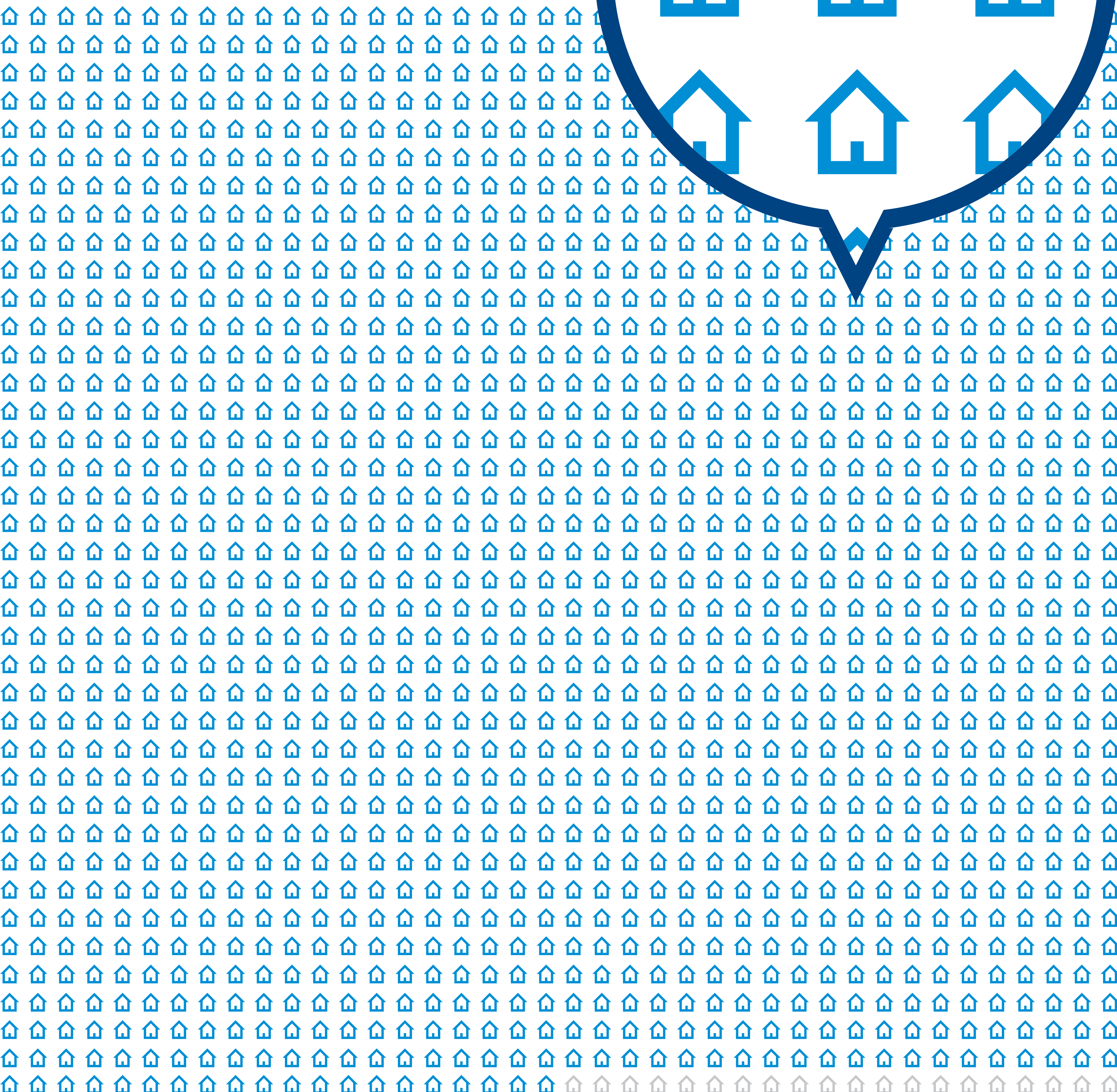
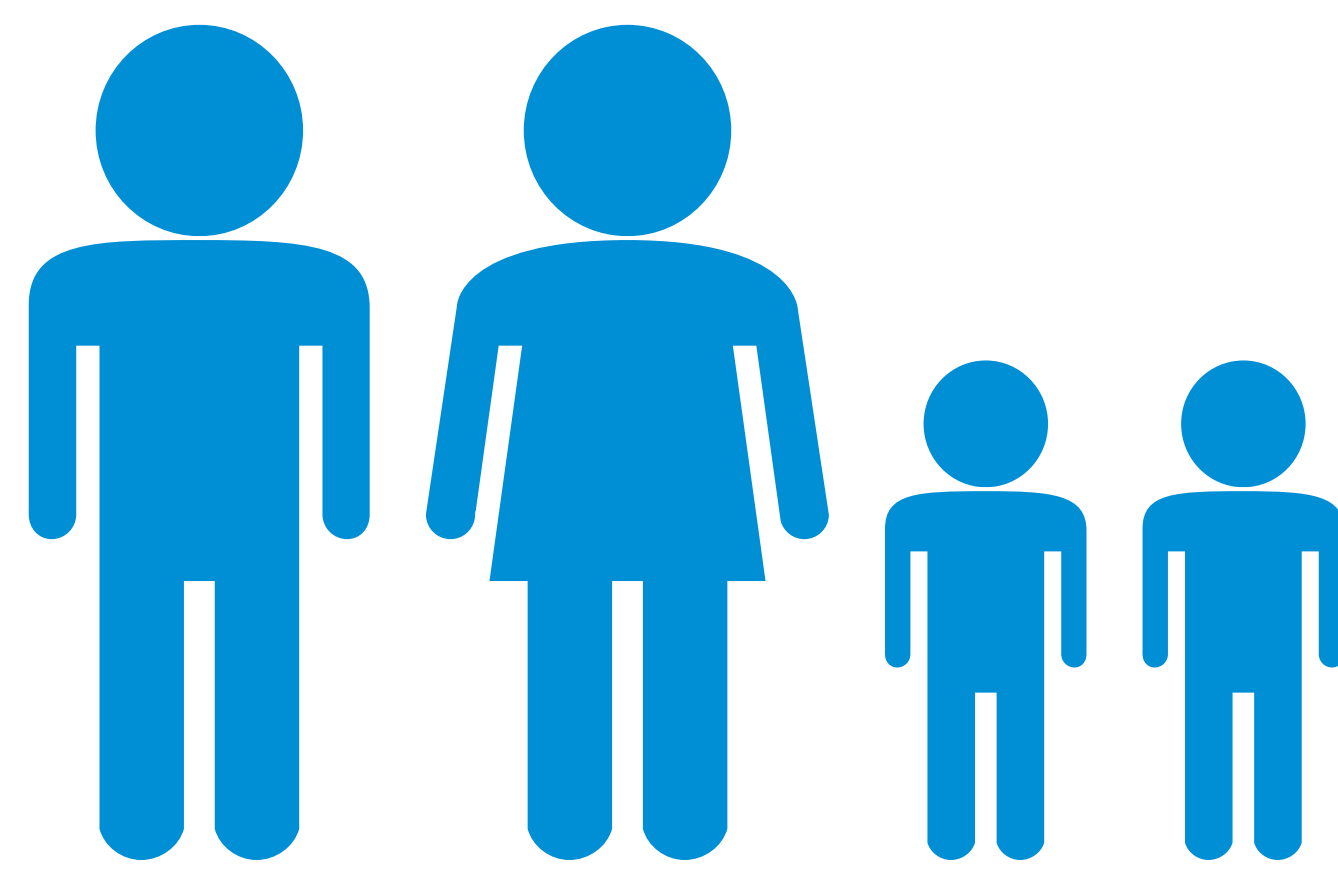
140,000  Trees lining Manhattan, New York, streets<sup>§</sup>

Since its inception, **HiWAY fracturing** has conserved:

350,000,000  
gallons of water  
8,300,000 barrels



2,400+  
households<sup>††</sup>  
annual water usage



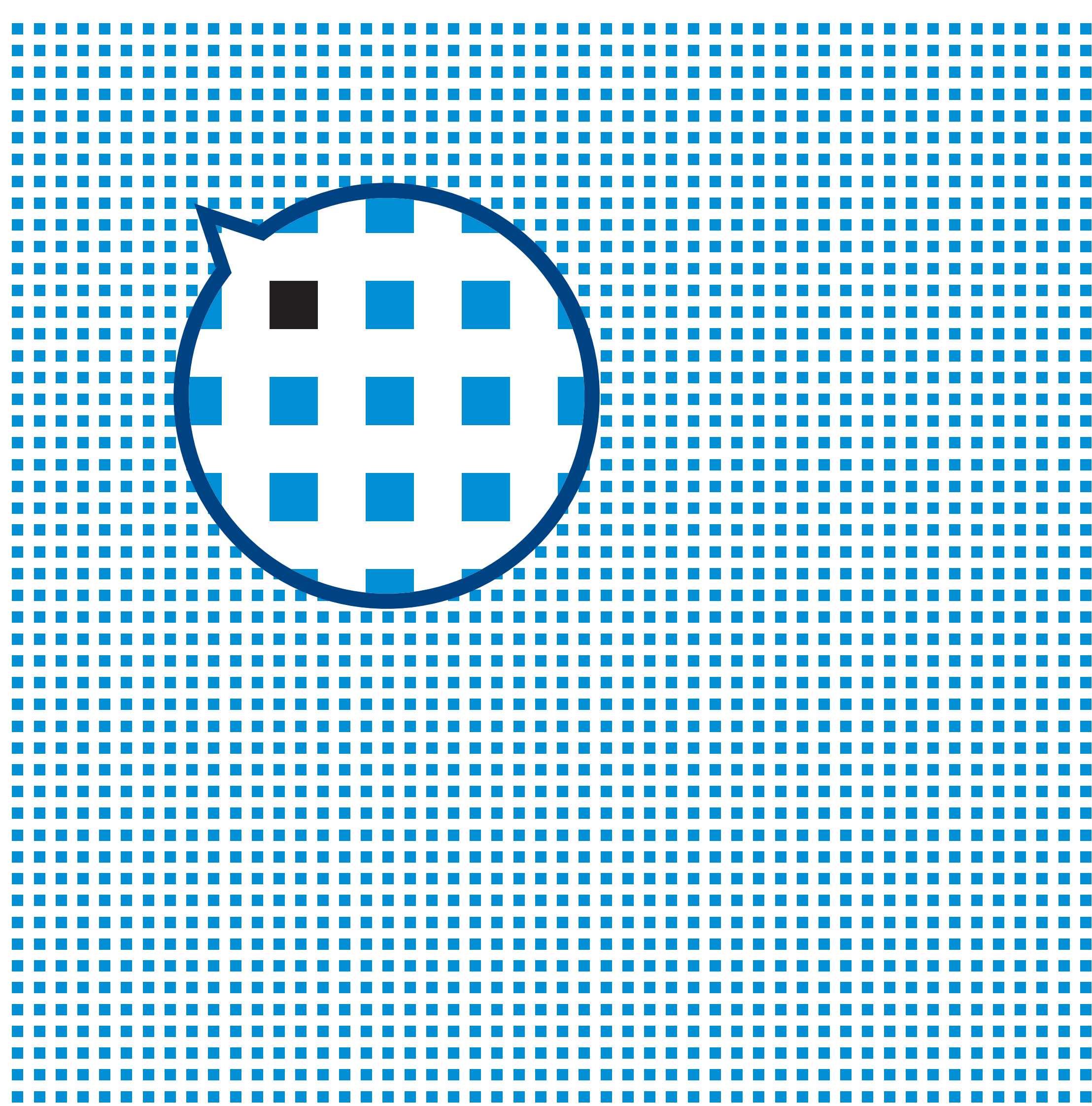


To date, the **HiWAY** service has prevented over 400 screenouts.

### HiWAY Fracturing

99.95% proppant  
placement rate

Unprecedented in the industry

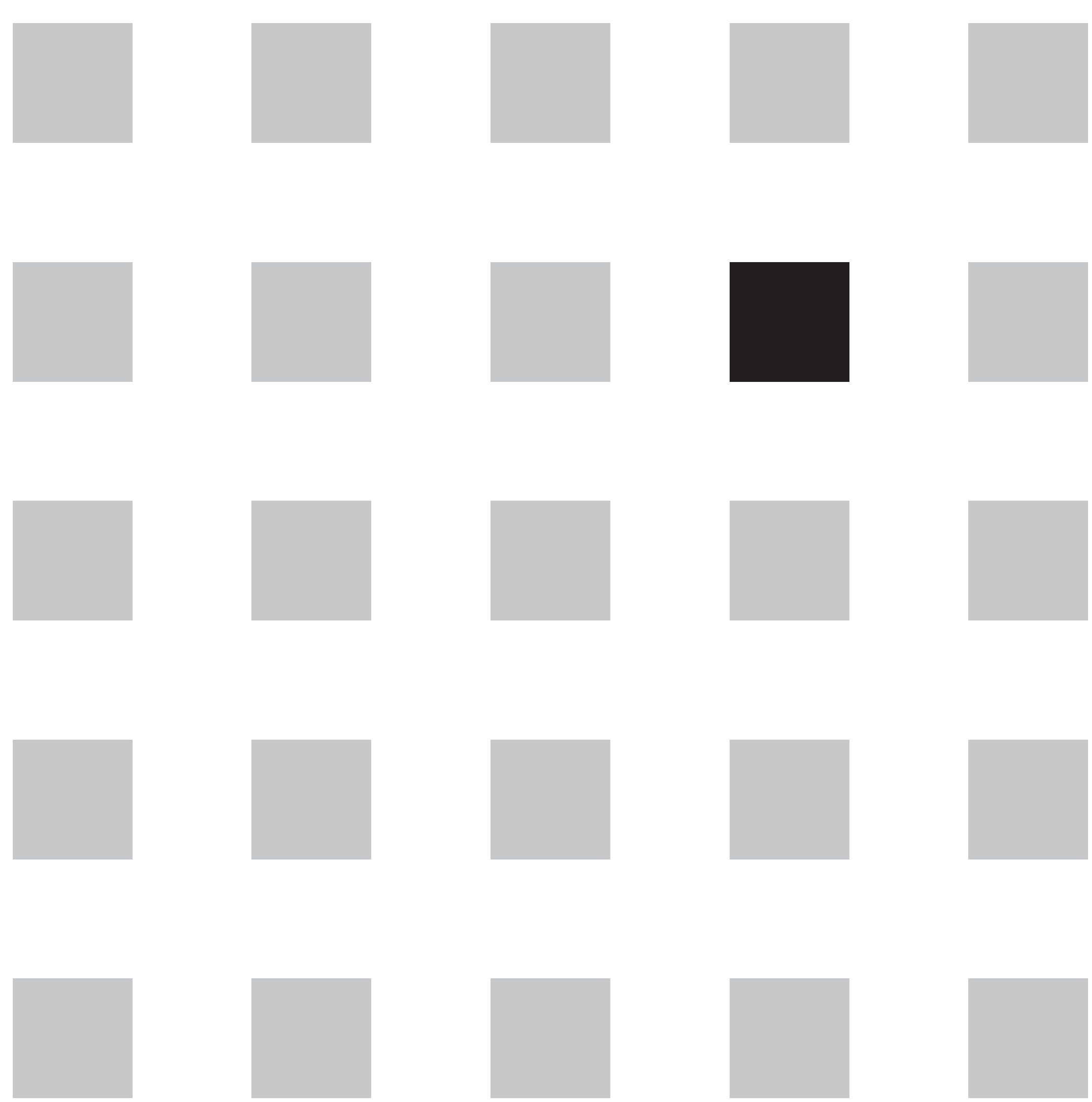


1 screenout  
every 2,000 jobs

### Conventional Fracturing

95–97% proppant  
placement rate

Industrywide average

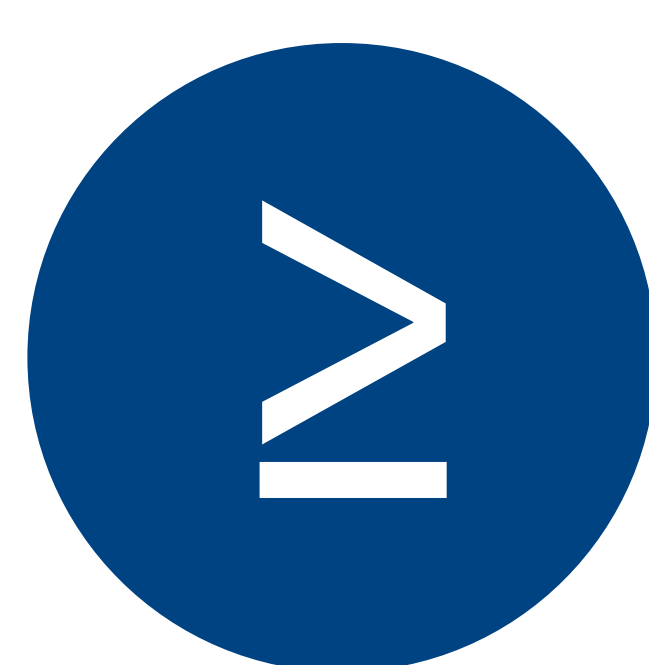


1 screenout  
every 25 jobs

Since 2010, **HiWAY** fracturing has saved:

1.2 billion  
pounds of  
proppant

10,206,386 ft<sup>3</sup>



Enough to fill any of the following:

6,400 railroad cars

320 Boeing 747 interiors<sup>†</sup>

60 Big Bens (Clock Tower)

9 Washington Monuments

2 RMS Titanic



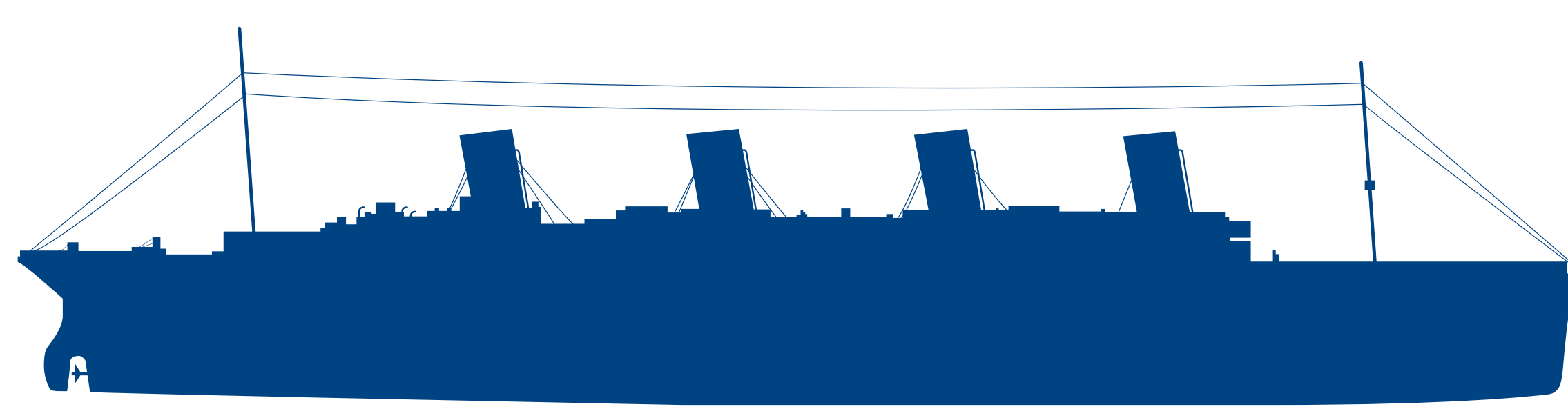
9×

Washington  
Monument  
1,077,630 ft<sup>3</sup>



60×

Big Ben  
164,200 ft<sup>3</sup>



2×

RMS Titanic  
4,632,800 ft<sup>3</sup>



320×

Boeing 747-400  
interior  
31,285 ft<sup>3</sup>



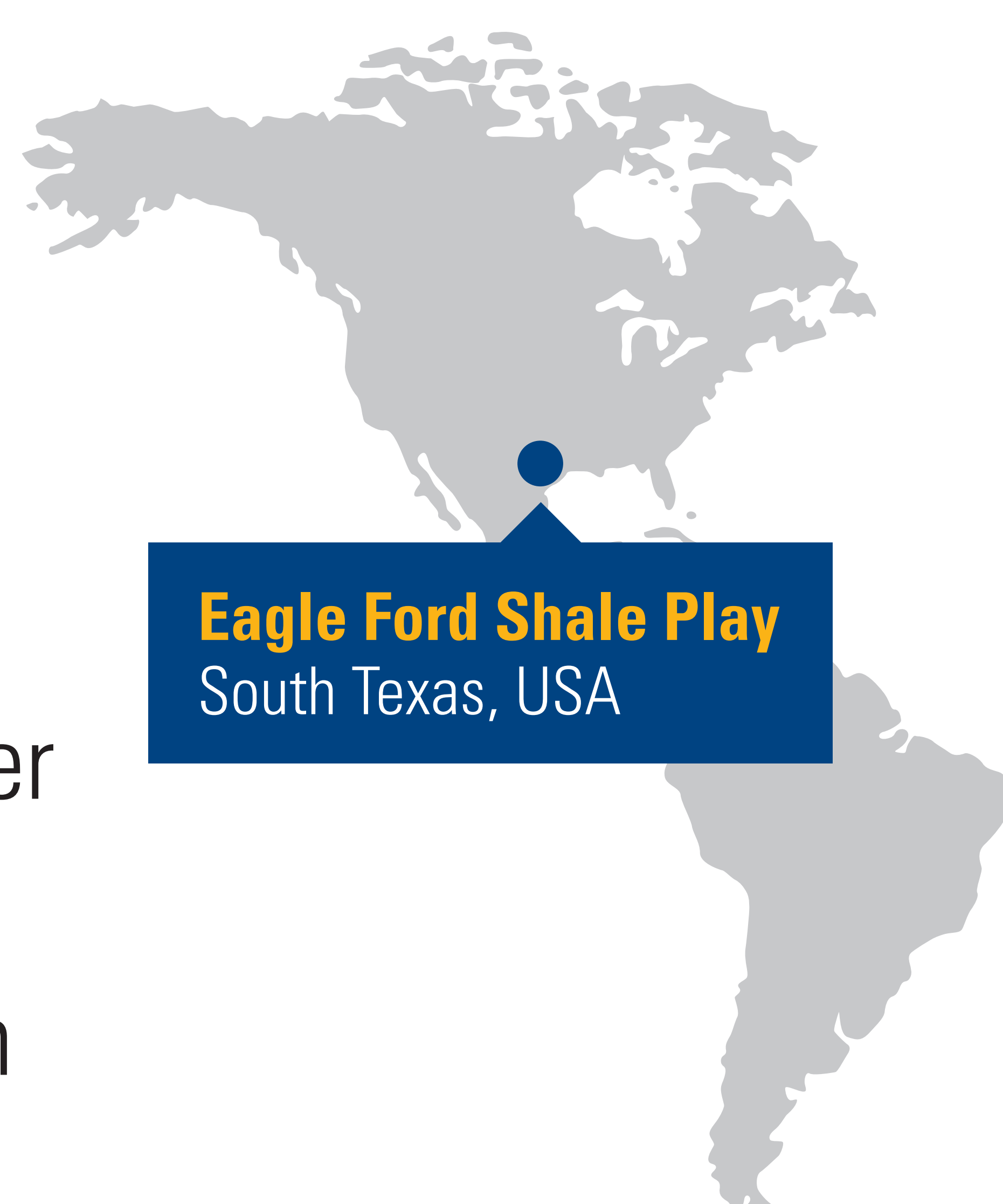
6,000 railroad cars  A train more than 50 miles in length

# Schlumberger

## In a recent Eagle Ford case study...

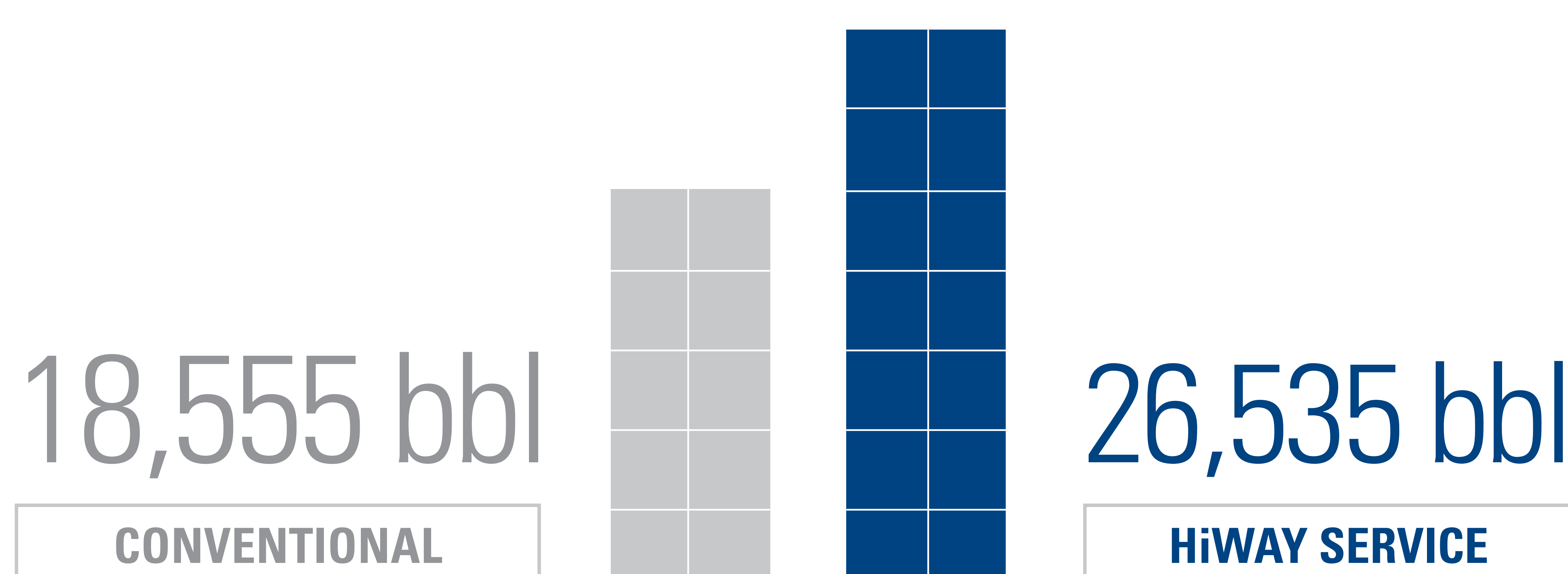
### The HiWAY service

- increased 60-day cumulative oil production 43%
- increased 60-day cumulative gas production 61%
- saved 5 million gallons of water per well
- reduced proppant consumption by 1.3 million pounds per well.



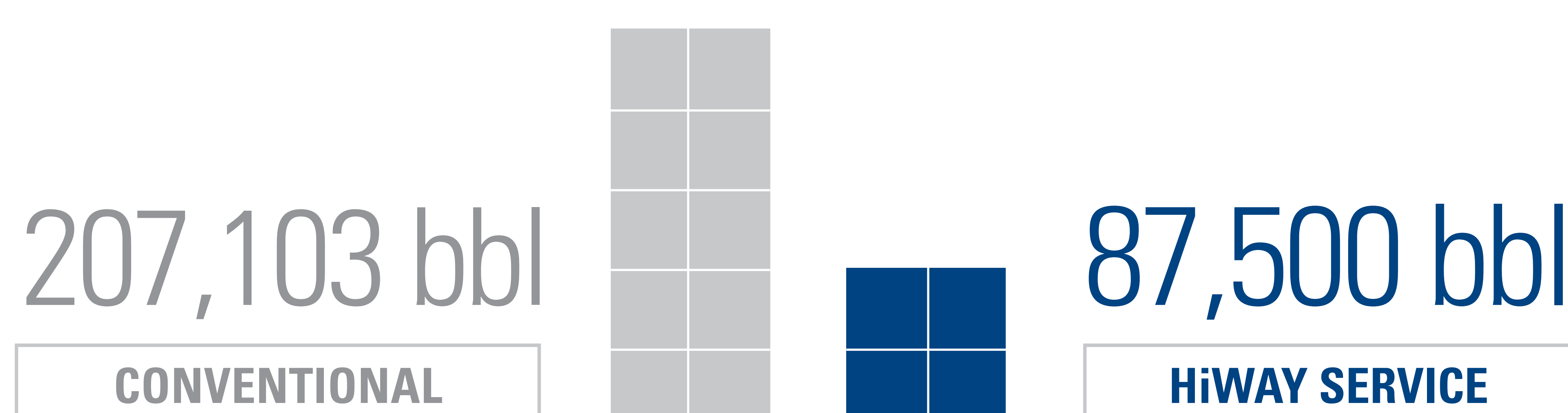
### CUMULATIVE CONDENSATE PRODUCTION

↑ 43%



### FRACTURING FLUID USAGE

↓ 58%



### PROPPANT USAGE

↓ 35%



Learn more at [www.slb.com/HiWAY](http://www.slb.com/HiWAY)

\*Source: EPA  
\*Source: Belling  
\*Source: City of New York Parks and Recreation  
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