

Modes of Transportation

The General Rule of Thirty and Some Zeroes

I can carry about 35 pounds in my backpack. Soldiers aim for a maximum pack weight of about 45 pounds for long marches. An older person might not want to carry more than 10 or 15 pounds. Let's say an average person can carry 30 pounds. We can add zeroes to that number to compare other modes of transportation:

30 pounds - a walking **human being** - up to double that for a smooth, level trail.

300 pounds - a **horse** carrying things on its back (that's one cowboy plus a saddle, blanket, rope, canteen, and a few other little things)

3000 pounds - a **wagon** pulled by a horse (that's one pioneer family moving west, let's say 5-7 people and all their tools, clothing, and supplies)

30,000 pounds - a **canal boat** in the old days, or an 18-wheel **truck** on the road today. To avoid road damage, trucks are legally limited to 80,000 total pounds - truck, trailer, spare tires, toolkit, cargo, driver, sandwich, coffee, etc. A bus is about the same size and can carry 50-70 people and luggage

300,000 pounds - the largest cargo **airplane** for a short distance. To go farther, planes need more fuel, so the average cargo load is 240,000 pounds. Turning a plane into a people-mover adds weight for seats, windows, lights, oxygen masks, snacks, and so forth. The largest planes, therefore, carry about 500-700 people and their luggage.

3,000,000 pounds - a **river boat** or 60-car mixed **train**. Like other modes on this list, trains and river boats vary widely in sizes and capacities, so this is just an average figure, but it is in the right ballpark.

30,000,000 pounds - 120-car **unit coal train** or "handysize" **ship**. A handysize ship can dock in most ocean ports even at low tide. A 120-car coal train can supply a large power plant for one day.

300,000,000 pounds - large **container ship** A container ship hauls big steel boxes that can be loaded onto a truck or train. A standard container is 20x8x8.5 feet. It can hold 48,000 pounds. Most containers weigh less, because they carry things like potato chips, shoes, or chairs, which fill the box without reaching the weight limit. A big container ship holds 15,000 TEUs (20-ft equivalent units). A "Panamax" is a ship that barely fits through the Panama Canal. It can hold only about 5000 containers or 150,000,000 pounds. That's why the biggest container ships have to stay in one ocean all their lives! A Great Lakes **ore boat** holds roughly as much as a Panamax ship. The Great Lakes are a globally unique resource, because huge ships are a cheap way to move coal and iron ore to the steel mills in Chicago, Detroit, and other cities.

1. How many horse-loads would it take to fill a canal boat? _____
2. How many cargo planes would it take to replace one 60-car mixed train? _____
3. How many wagons would it take to move the coal from a 120-car unit train? _____
4. How many 60-car trains would be filled by the load from one Panamax ship? _____