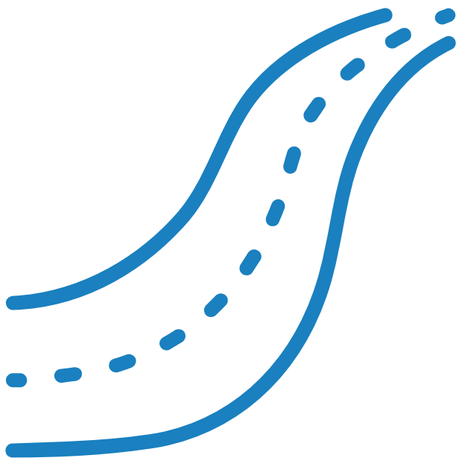
Roads

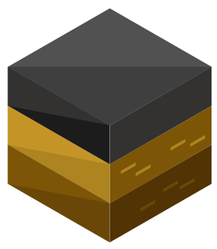
What Is It?

Roads are paved surface corridors optimized for the use of motor vehicles primarily for transportation.



What Are They Made Of?

Petroleum-based asphalt and rock-based concrete are the two most common materials used in roadway construction, alongside gravel, steel, and other support components.



What Does It Cost?

Rural roads with few natural barriers are the cheapest to construct, while urban roads and highways are the most expensive. On average, every mile of road costs several million dollars to build. Road construction and maintenance are funded primarily through excise fuel taxes collected at the pump.

Space

There are 4.18 million miles of roadways in the U.S. ranging from Interstates to rural roadways. The approximately 40,000 square miles of surface area roads occupy facilitate travel in and around local communities and allow for trucks, cars, and other vehicles to move cargo and travel quickly throughout the country.

Point

- Concrete roads last 20 to 40 years on average, almost double the lifespan of asphalt.
- Asphalt is 100 percent recyclable.
- Concrete can handle heavy truck traffic and is mainly used in highway construction.
- Asphalt has better traction and skid resistance than concrete roads.
- Asphalt production emits large amounts of greenhouse gases.

Counterpoint

- Entire concrete slabs must be removed in order to be repaired, while asphalt can be patched or repaved on site.
- Asphalt's lifespan only lasts ten years.
- Concrete does not filter liquids as easily as asphalt. Innovations like porous concrete may be necessary in parking lots and sidewalks to improve drainage.
- Vehicles are one to seven percent more fuel-efficient on concrete roads.
- Road noise is much higher on concrete roads than asphalt.

How Do They Work?

1. Engineers first identify soil conditions, drainage capabilities, and the initial traffic volume that the road will need to handle.

2. Embankments may be built to elevate the roadway and the screened dirt is flattened to support the roadway.

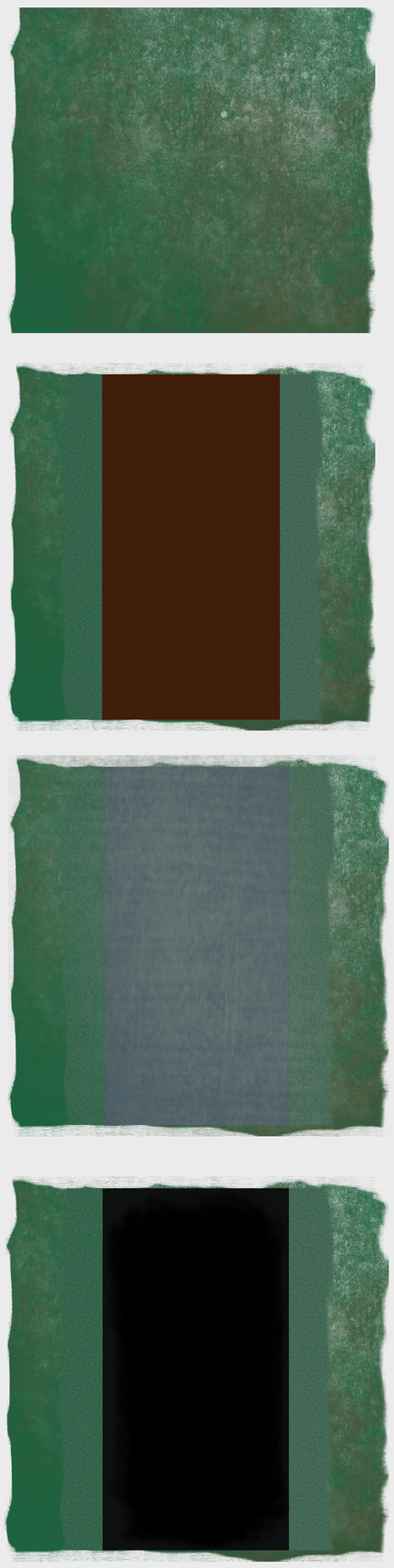
3. Screened dirt is then compacted to its greatest density before drains and sewers are added to maximize the road's life expectancy.

4. Inspections by governing authorities are conducted to ensure regulations have been followed.

5. Gravel is placed in layers on the road bed and is moistened and compacted until the road is at the height that is called for. Finally, the road is paved.

6. *Either* asphalt is spread and compacted on the gravel layers.

7. *Or* concrete is poured. To prevent cracks, workers cut joints in between concrete. This also allows the concrete to expand and contract in varying temperatures.



Did You Know?

The busiest highway in the U.S. is I-95 at SR 4 in Fort Lee, NJ with an average traffic speed on the highway of just 29.7 miles per hour and the largest amount of congestion in the country.

What's Next?

Asphalt production has traditionally been a large emitter of greenhouse gases. Manufacturing asphalt at lower temperatures reduces the emissions, odor, and fuel consumption. These changes do not increase the price of asphalt and reduce overall emissions by 20 percent.