Emerging Technology Spotlight - Mobility
National Geospatial Advisory Committee

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build what everybody else is talking about
Trends: How We Move Things

By 2045, the U.S. economy is forecast to grow by 115% to $36.7 trillion—and the transportation sector will represent about $1.6 trillion of total Gross Domestic Product.

Global Demand for U.S. Products

Global trade is one of the brightest spots in our economy. U.S. exports reached $2.3 trillion in 2018, setting a new record for the 4th straight year.

$1 billion in exports = 5,000 U.S. jobs

The U.S. energy boom is placing unprecedented demand on our transportation system.

Crude oil production is up 50% since 2008.

42x the 9,500 carloads of crude oil in 2008

By 2040, the U.S. freight volume will grow to 29 billion tons—an increase of 45%.

By 2040, the value of freight will grow to $39 trillion—an increase of 125%.

Major gains in freight movement are predicted by 2040.

Freight Movement is Multimodal

Every mode of transportation moves freight, but trucking is the primary mode of freight travel.

System Performance and the Cost of Congestion

By 2040, nearly 30,000 miles of our busiest highways will be clogged on a daily basis.

Truck congestion wastes $27 billion in time and fuel annually.

Ref: BeyondTraffic 2045
Trends: How We Move Things Better

More and more, the transportation sector is relying on data to drive decisions, and on technology to reimagine how we move people and goods.

Connected Vehicles
Vehicles that communicate are the latest innovation in a long line of successful safety advances. The motor vehicle fatality rate has dropped by 80% over the past 50 years.

Robotics
Advances in robotics are changing transportation operations and will impact the future transportation workforce. Robots will perform vital transportation functions, such as critical infrastructure inspection.

NextGen
GPS and new technologies are leading to a safer, more efficient U.S. airspace. By 2020, one-second updates will pinpoint the aircraft location and speed of 30,000 commercial flights daily.

Real-time Travelers
Mobile access to everything from traffic data to transit schedules informs our travel choices. 90% of American adults own a mobile phone. 20% use their phones for up-to-the-minute traffic or transit information. Smartphones are regularly used for turn-by-turn navigation.

Big data is all around us. Global data generated is projected to grow by 40% annually. Data enables innovative transportation options, such as car-sharing, ride-sharing, and pop-up bus services, and more rapid delivery of goods.

Ref: BeyondTraffic 2045
Trends: How We Adapt

Our changing climate is disrupting transportation systems in the U.S. and abroad. 100-year devastating storms used to occur once a century ...

... but with the climate changing, they could occur every 3 to 20 years (by 2080).

We’re Heating Up
Average U.S. temperatures are rising. By 2050, our temperature is predicted to rise 2.5°F. Scientists say we need to avert a 2°F increase in temperature to avoid the most catastrophic impacts of climate change.

Globally, the 10 warmest years have occurred since 1998.

U.S. droughts and western wildfires cost $30+ billion in 2012 alone.

In extreme heat:
- Roads deteriorate faster
- Truck tires are prone to blow out
- Rail track buckles
- Runways soften
- Inland waterway traffic is disrupted during droughts

Rising Sea Levels Will Disrupt Transportation
Superstorm Sandy’s surge damaged electrical systems, highways, rail track, runways, and port cargo. The cost to the U.S. economy was an estimated $65 billion.

U.S. Airport Elevations
Sea level is projected to rise up to 1 foot (2045)

Louis Armstrong (New Orleans)
Ft. Lauderdale
San Francisco
Oakland
LaGuardia
Miami
Philadelphia
Newark
Reagan
Tampa
JFK

Sea level is projected to rise up to 4 feet (2100)

The transportation sector is the second-biggest source of greenhouse gases (GHGs) in the U.S. New stronger fuel economy standards will double the efficiency of our cars and trucks. Corporate Average Fuel Economy Standards have saved 14 billion tons of CO₂ emissions since 1970.

Ref: BeyondTraffic 2045
Feedback: Equity and the Opportunity Gap

A Global Problem ... 
... an American Problem

80 individuals have as much wealth as the poorest half of the world – $3.5 billion people.

80 = 3,500,000,000

Income inequality in the U.S. has more than doubled since 1980, well outpacing other wealthy nations.

Share of income held by the richest 1%

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<th>1980</th>
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<tr>
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<tr>
<td>Korea</td>
<td>7.5%</td>
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<tr>
<td>U.S.</td>
<td>8%</td>
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Big Bonuses, Low Wages

$28.5 billion

$14 billion

Why Does Transportation Matter?

Transportation gets low-income people ...

- To their first jobs, second jobs, third jobs ...
- To and from daycare and school ...
- To grocery stores ...
- To health-care providers ...
- To all the places that ALL Americans go ...

The Cost of Transportation

Americans spend more on transportation than they do on:

- Food
- Health care
- Clothing

Low-income Americans spend nearly a quarter of their annual income on transportation ...

... while high-income Americans spend only about one-tenth on transportation.

It’s not just dollars and cents. Both where we live and where our jobs are have a huge impact on how we move.

People in poverty with shorter commutes have a better chance of getting out of poverty ...

... than those with long commutes.

Ref: BeyondTraffic 2045
Not every innovation in transportation is going to come from government or even a large enterprise.

Anthony Foxx
U.S. Secretary of Transportation
Creating a culture of innovation requires a thoughtful approach