

The year is
2045.



U.S. Department of Transportation

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A driver sits in traffic for hours, which may have been common in Los Angeles a generation before.

But this particular driver lives in Omaha, Nebraska.

In 2045, Omaha is the new LA.

Half a country away, a businesswoman boards the train on the Long Island Rail Road.

The day before, that same train was already too full to board and bypassed her station. So did the next train.

Now, the woman wonders not just *when* she will get to work...

But if she will get there at all.

America's transportation system is a fossil in 2045.



In Asia, electric buses travel endlessly without refueling because they receive their power wirelessly.



In Europe, driverless cars zoom around the highways, and because the technology is so safe, car crashes are as much a part of the past as horse-and-buggy accidents.



But in the United States, these technologies are little more than novelties. They are not in wide use because the government did not encourage them or put a plan in place to regulate them.

This could be the future we're heading for, according to *Beyond Traffic*, a new study from the U.S. Department of Transportation.

But *Beyond Traffic* also tells us:

We can chart a
BETTER course.



We can build a
transportation system as

AMAZING

as the other is
terrifying.

Imagine
eliminating
9 out of every **10**
car crashes.

That's the bright promise
driverless technology
holds over the next 30 years.

Imagine your
plane never has to circle
the airport again,

because flights are
perfectly timed and the skies
are *clear of congestion*.

This is the potential of
"NextGen"
air traffic control systems.

Imagine that
ANYONE can
reach **ANY** job,

even
without a car.

Imagine that **ANY**
business can open
ANYWHERE,

and know
customers will be
able to get there.

That's the transportation system
Beyond Traffic says we can build.

Beyond Traffic looks at the
latest data and anticipates
the trends and choices facing
our transportation system
over the next three decades.

But in the end, it does
not provide a roadmap
that leads to one future.
Or another.

Beyond Traffic is not
a **blueprint**, telling us
how to build our
transportation system.

*Instead, it is
the blue paper.*

The thing on which
we can begin
asking the **BIG** questions,
looking at the **BIG** trends,
and – *hopefully* – inspiring
some **BIG** minds
to come up with some
BIG answers.

|How will we move?

How will we build a transportation system that doesn't just let a growing population travel – but lets them travel SAFER than ever?

|How will we move things?

How will we reduce freight chokepoints that drive up the cost of owning a business?

|How will we move better?

How can we knock down barriers to new technologies that promise to make travel safer and more convenient?

|How will we adapt?

How do we make our infrastructure more resilient for a time when weather events like Hurricane Sandy will occur with increasing frequency?

|How will we align decisions and dollars?

How can we invest the trillions of dollars our transportation needs in the smartest way possible?

Beyond Traffic does not close the book on these questions.

IT OPENS THE BOOK WIDER

...

Giving all of us more and better data with which to answer them.

Think of
Beyond Traffic
as an invitation...



... to a
conversation.

Everyone uses our
transportation system...

...which means **ANYONE**
can help build its future.

We want to hear from

YOU.

In 30 years, how will you travel?

Share your ideas at
www.dot.gov/beyondtraffic

But first, **turn the page.**

And find out more about the trends and choices ahead of us.

How will we move?

Population Increase

2015: **320 million people**
2045: **390 million people**

In 30 years our population is expected to grow by about

70 million

... that's more than the current populations of



Bumper-to-Bumper

On average, we spend

over 40 hours



stuck in traffic each year

The annual financial cost of congestion is

\$121 billion



Older Americans — Redefining Longevity

By 2045, the number of Americans over age 65 will increase by



77%

About **one-third of people over 65** have a disability that limits mobility. Their access to critical services will be more important than ever.

Millennials — Shaped by Technology

There are **73 million Millennials** aged 18 to 34. They are the first to have access to the internet during their formative years and will be an important engine of our future economy.

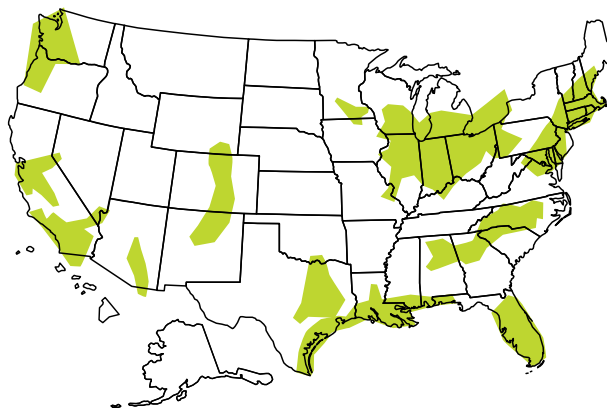
Millennials are driving less. By the end of the 2000s, they drove over **20% fewer miles** than at the start of the decade.



Income Inequality

10% of the population takes home **one-third** of our national income.

Transportation is the **second-largest** expense for U.S. households.



Megaregions and Shifts in Population Centers

11 megaregions are linked by transportation, economics, and other factors.

They represent over **75%** of our population and employment.

In 2014, **365,000** people moved to the South—up **25%** from 2013—and moves to the West doubled.

How will we move things?

Transportation and the Economy

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.

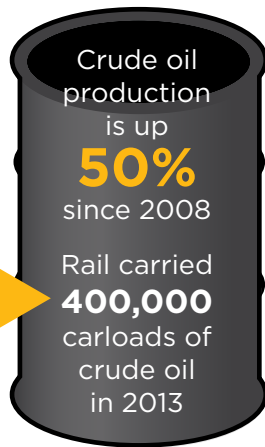
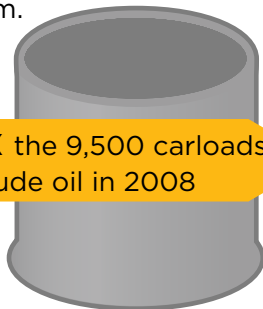


\$1 billion in exports = **5,000 U.S. jobs**

The U.S. energy boom

is placing unprecedented demand on our transportation system.

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



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



Major gains in freight movement are predicted by 2040

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



54 million tons of freight move across our nation every day

Freight Movement is Multimodal

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

	2012	(in tons)	2040
Truck	13.2 billion	+43%	18.8 billion
Rail	2.0 billion	+37%	2.8 billion
Waterborne	975 million	+10%	1.1 billion
Air	15 million	+250%	53 million

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.



How will we move 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

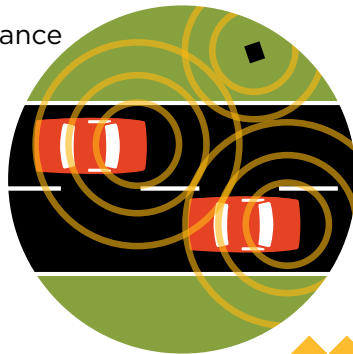
80%

over the past 50 years.

Connected vehicles and new crash avoidance technology could potentially address

81%

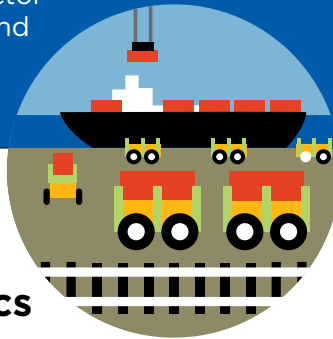
of crashes involving unimpaired drivers.



Robotics

Advances in robotics are changing transportation operations and will impact **the future transportation workforce**.

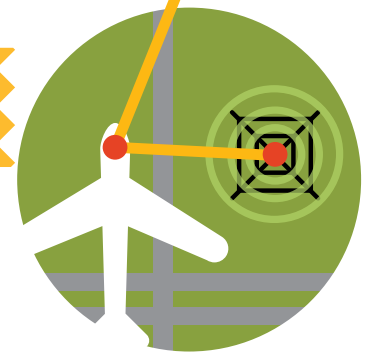
Robots will perform vital transportation functions, such as critical infrastructure inspection.



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.

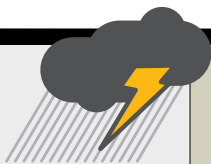
Data enables innovative transportation options, such as **car-sharing, ride-sharing, and pop-up bus services**, and more **rapid delivery of goods**.



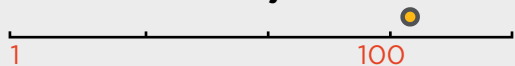
How will we adapt?

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**.

Louis Armstrong (New Orleans)

Ft. Lauderdale

San Francisco

Oakland

LaGuardia

Miami

Philadelphia

Newark

Reagan

Tampa

JFK



U.S. Airport Elevations

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

Sea level is projected to rise up to **1 foot** (2045)

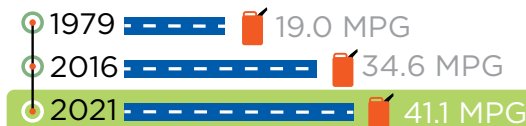
The transportation sector is the second-biggest source of greenhouse gases (GHGs) in the U.S.



Transportation emits **28%** of GHGs

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.



How will we align decisions and dollars?

Transportation Investment

Improving the condition and performance of the transportation system will cost



\$120 billion

for highways and bridges between 2015 and 2020. Current annual spending at all levels of government —federal, state and local—is just

\$83.1 billion.



\$43 billion

for public transportation. Meanwhile, annual capital spending is just

\$17.1 billion.

To compete in the global economy, the U.S. needs a world-class transportation system. Some of our most critical transportation infrastructure is crumbling.

65% of U.S. roads are in **less than good condition**



25% of U.S. bridges **need significant repair** or can't handle today's traffic



50% of locks and chambers are **more than 50 years old**



Overall U.S. Infrastructure Grade

D+

Our World Standing

Quality of roads 2008 **8th**

Quality of roads 2014 **16th**

Transportation Spending is in Decline

Our highway and mass transit accounts are trending toward the red. The Federal gas tax is no longer enough to address our transportation needs.

The Federal gas tax has not increased for over 20 years ...



1993

2015

... and the value of the dollar has declined.

Transportation Trust Fund projected annual shortfall



Transit

Highway

Oregon Pilots Road User Charges

Oregon is one of many States seeking new revenues to make up for transportation budget shortfalls.



During a recent pilot program in Oregon, participants paid **1.56 cents per mile driven** rather than a state tax of **30 cents per gallon of gasoline.**

1.56¢



Over the next decade higher fuel economy standards will result in more than **\$50 billion** in lost gas tax revenues.

Go to
www.dot.gov/beyondtraffic
to read the full study.



#beyondtraffic