The year is 2045.
The year is 2045.

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 ...
...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 NY, TX, and FL.

#### 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. U.S. exports reached $2.3 trillion in 2013, 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. Rail carried 400,000 carloads of crude oil in 2013. 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%.

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

**Freight Movement is Multimodal**

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

<table>
<thead>
<tr>
<th>2012 (in tons)</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Truck</strong></td>
<td>13.2 billion +43%</td>
</tr>
<tr>
<td><strong>Rail</strong></td>
<td>2.0 billion +37%</td>
</tr>
<tr>
<td><strong>Waterborne</strong></td>
<td>975 million +10%</td>
</tr>
<tr>
<td><strong>Air</strong></td>
<td>15 million +250%</td>
</tr>
</tbody>
</table>

**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).

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.

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

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

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.

1979 19.0 MPG
2016 34.6 MPG
2021 41.1 MPG

U.S. Airport Elevations

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

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

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

U.S. droughts and western wildfires cost $30+ billion in 2012 alone
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
<table>
<thead>
<tr>
<th>Quality of roads</th>
<th>2008</th>
<th>18th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of roads</td>
<td>2014</td>
<td>16th</td>
</tr>
</tbody>
</table>

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
1 gal
30 cents

2015
1 gal
1.56 cents

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

Transportation Trust Fund projected annual shortfall

Transit
-$4 billion
Highway
-$12 billion

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.

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.