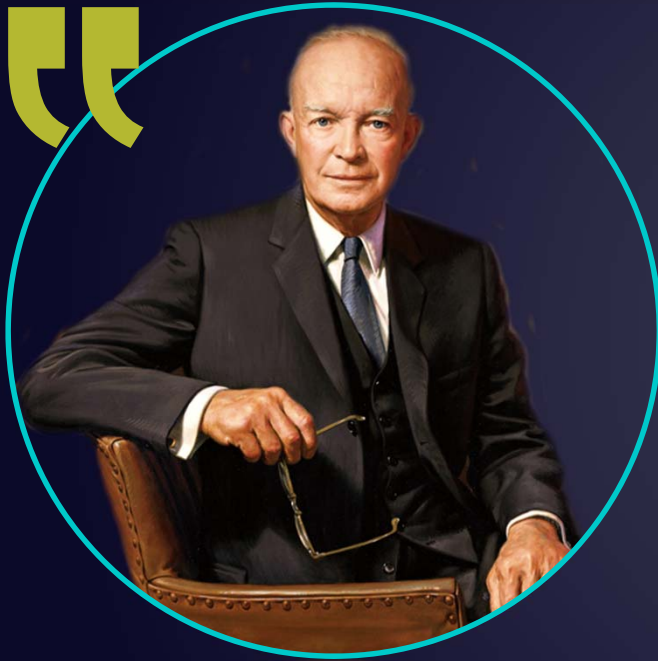




NCHRP Report 750 Series

**Informing  
Transportation's  
Future**

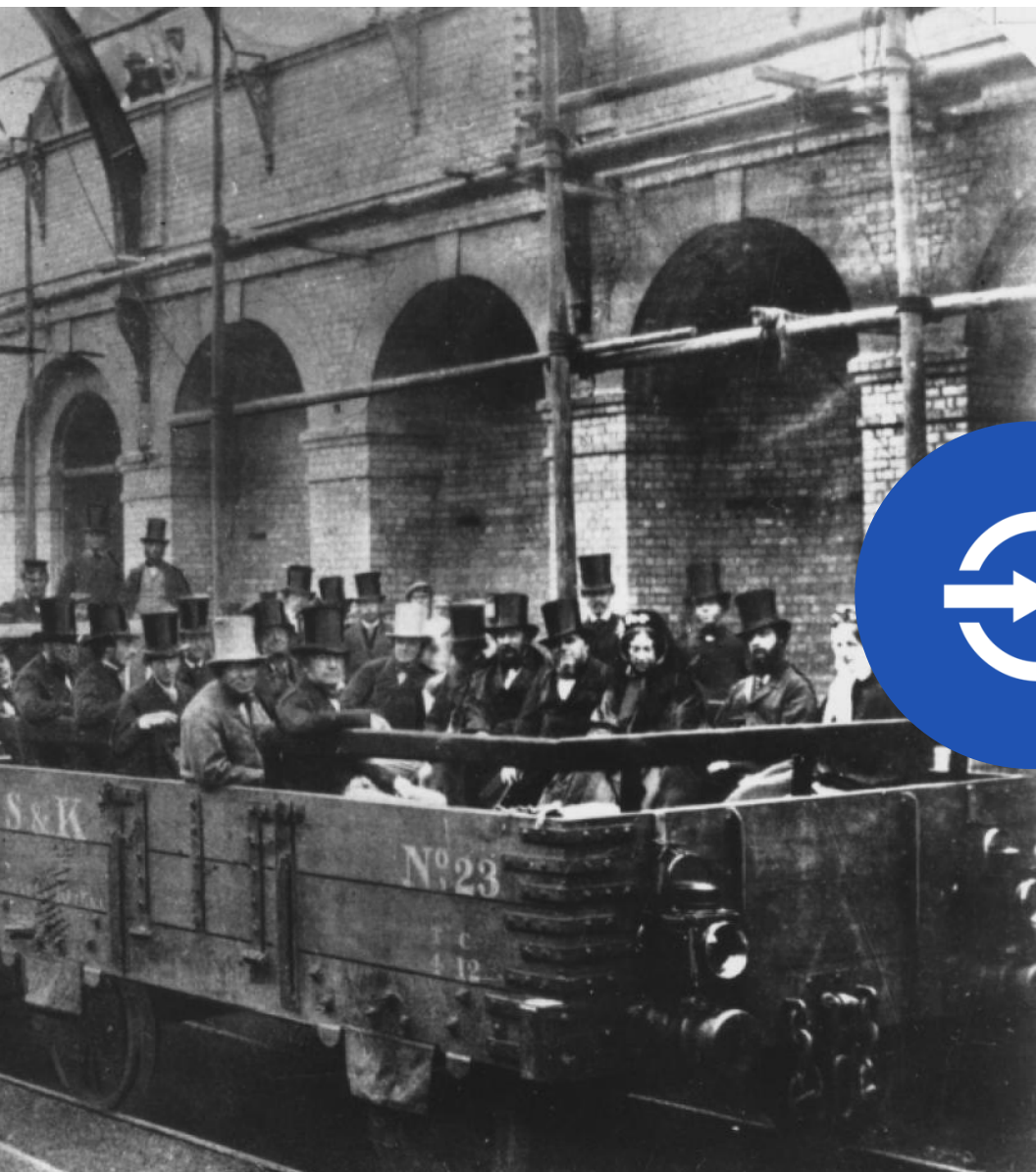
# WE LIKE **IKE**



**“If progress is to be steady we must have long term guides extending far ahead.”**

# WHY DO WE PLAN FOR THE FUTURE?

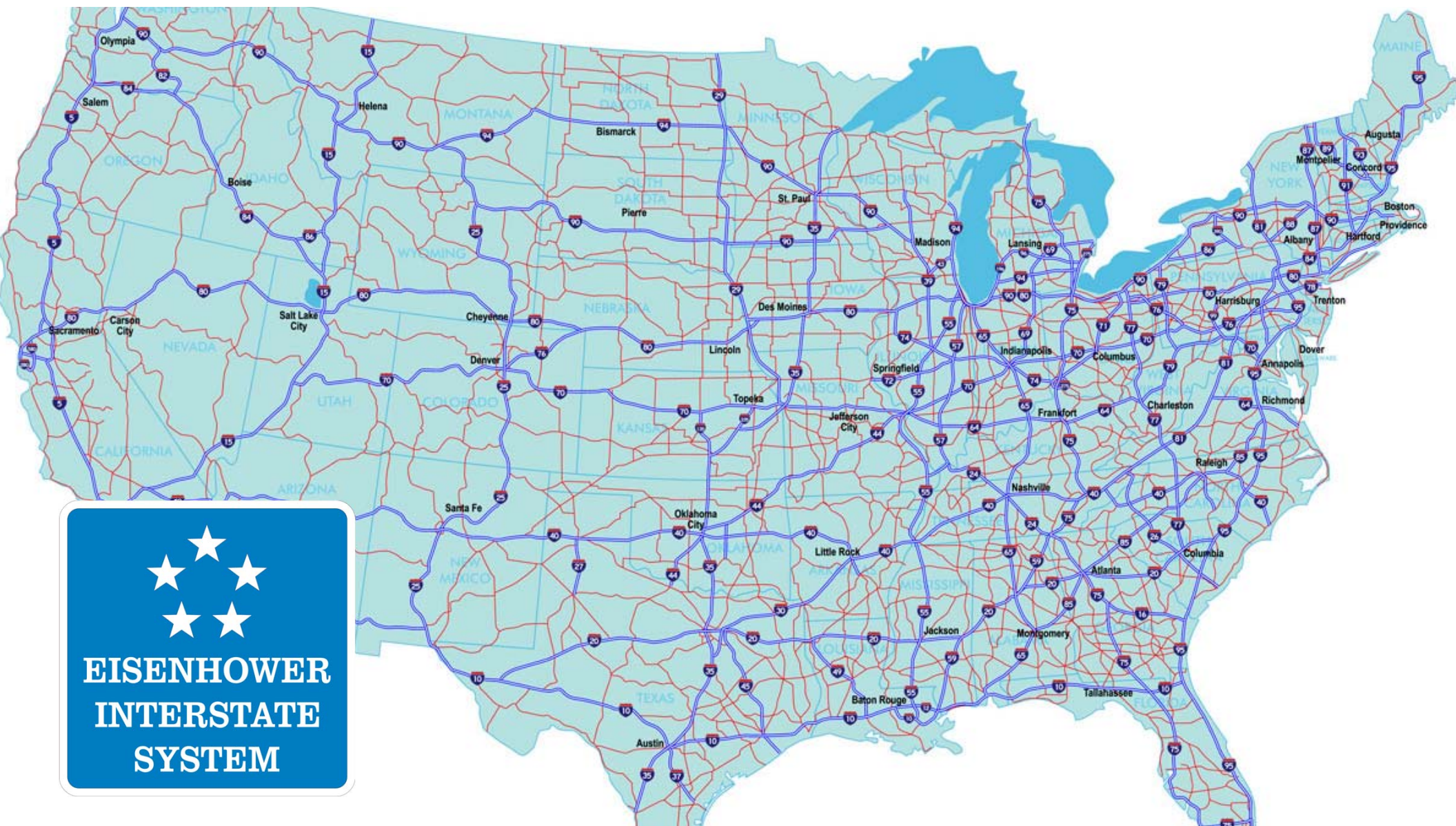
Does it really make a difference?









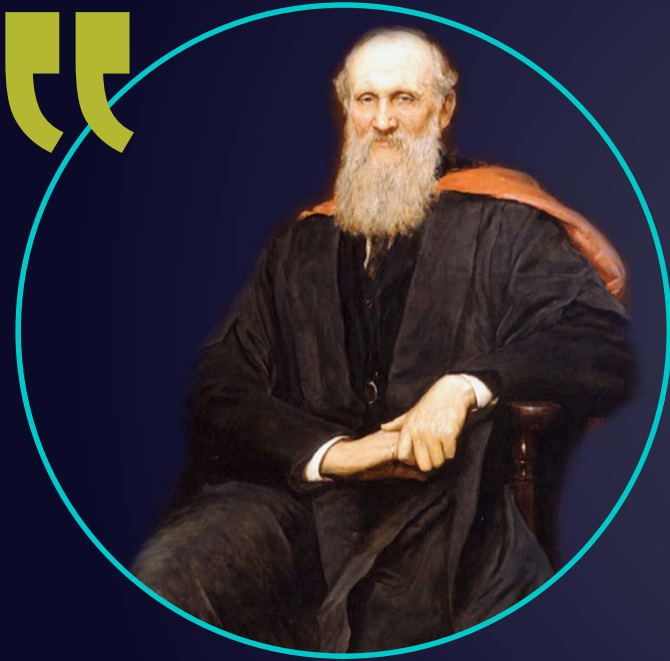


# IT'S EASY TO GET THE FUTURE WRONG

We have a long history of it, in fact.

# LORD KELVIN 1895

Mathematical Physicist



“Heavier-than-air  
flying machines  
are impossible.”



# HARRY WARNER 1925

One of the Warner Brothers



“Who the hell wants  
to hear actors talk?”

# THOMAS WATSON 1943

Chairman of IBM



**“I think there is a world market for maybe five computers.”**

# WE CAN'T PREDICT THE FUTURE

But, we can identify signposts pointing in the right direction.





# ONE OVERARCHING THEME

A shift from prediction to preparation



TODAY

PLANNING HORIZON



## POINT FORECAST

Planning for a short term point in time.



## RISK MANAGEMENT

Identifying and planning for both short and medium term risks.



## SCENARIO PLANNING

Looking out decades and letting the future drive the planning.



FUTURE 1

Possible Scenario



FUTURE 2

Possible Scenario



FUTURE 3

Possible Scenario

# MULTIPLE FUTURES

Alone or in combination?



## MOMENTUM

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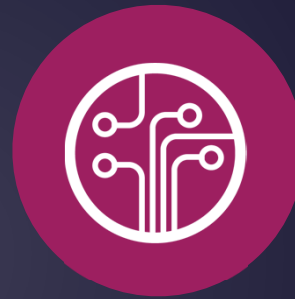
America gets older and more diverse.  
Global trade booms.  
Domestic growth flattens.



## GLOBAL CHAOS

---

Worldwide financial instability leads to negative growth.  
Extreme weather increases its impact.



## TECH TRIUMPH

---

New tech radically changes transportation.  
Economy booms and U.S. becomes more self reliant.



## GENTLE FOOTPRINT

---

Public demands low-impact choices.  
Regulations reduce consumption, increase government control.

# SOME QUESTIONS WE FACE TODAY

7 cross cutting questions

1. Will your organization work differently in the future?
2. Will the economy stay global?
3. What is resilient infrastructure and how much does it cost?
4. What if there is no more driving, but Vehicle Miles Traveled (VMT) still rises?
5. Where are the next boom towns?
6. Will cars fill up or plug in?
7. What's the relationship between more senior Americans and transportation?



# WHAT ELSE?

What are you seeing in the future?



# FORESIGHT 750 SERIES





# VOLUME 1: FREIGHT

Explore and plan for the  
future of freight with a  
scenario planning toolkit.

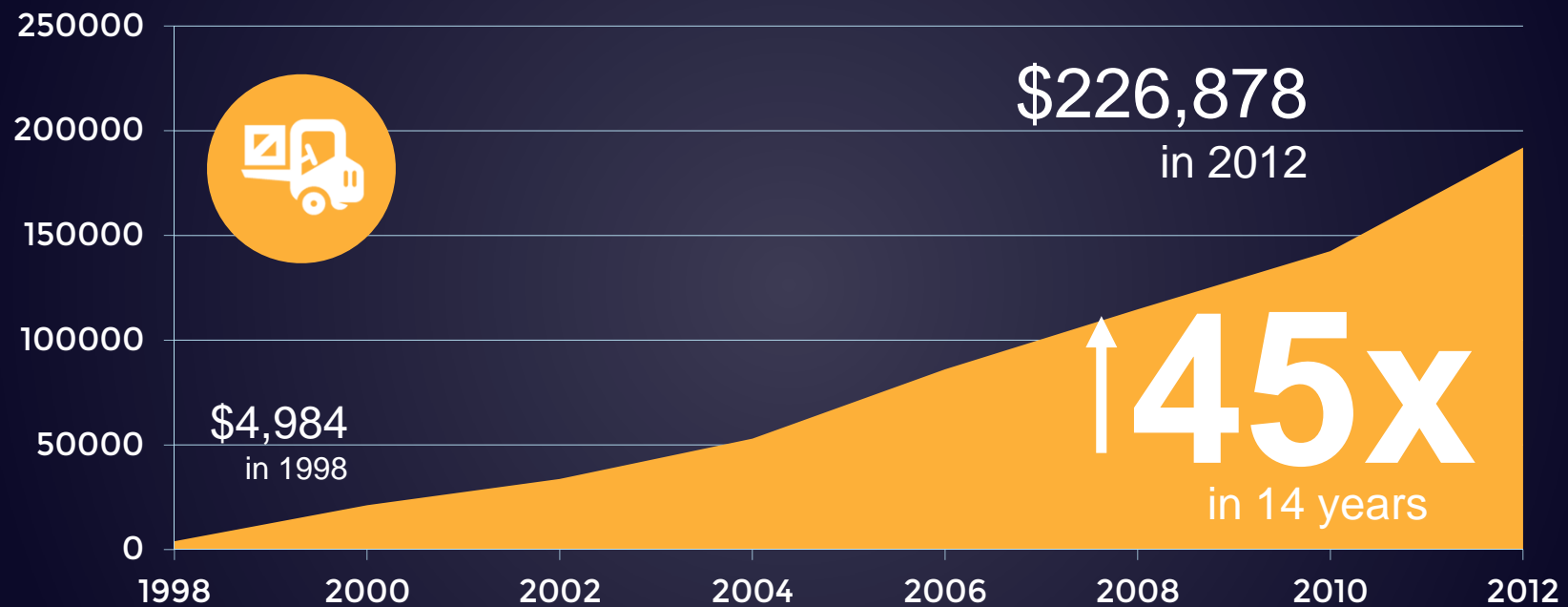
1





# FREIGHT

Total U.S. e-commerce sales (in millions)



# FREIGHT SIGNPOSTS

What to look for in the coming years.



## VITAL SIGNPOSTS

### **Volume:**

Will global freight trend up or down?

### **Technology:**

Does a major advance in technology, like digital printers, fundamentally change how goods are delivered?

### **Protectionism:**

Rising trade protectionism could shift global trade.

### **E-commerce:**

With goods being delivered directly to consumers, what is the future of local retail stores?



## VOLUME 2: CLIMATE CHANGE

How to prepare for extreme  
weather events.

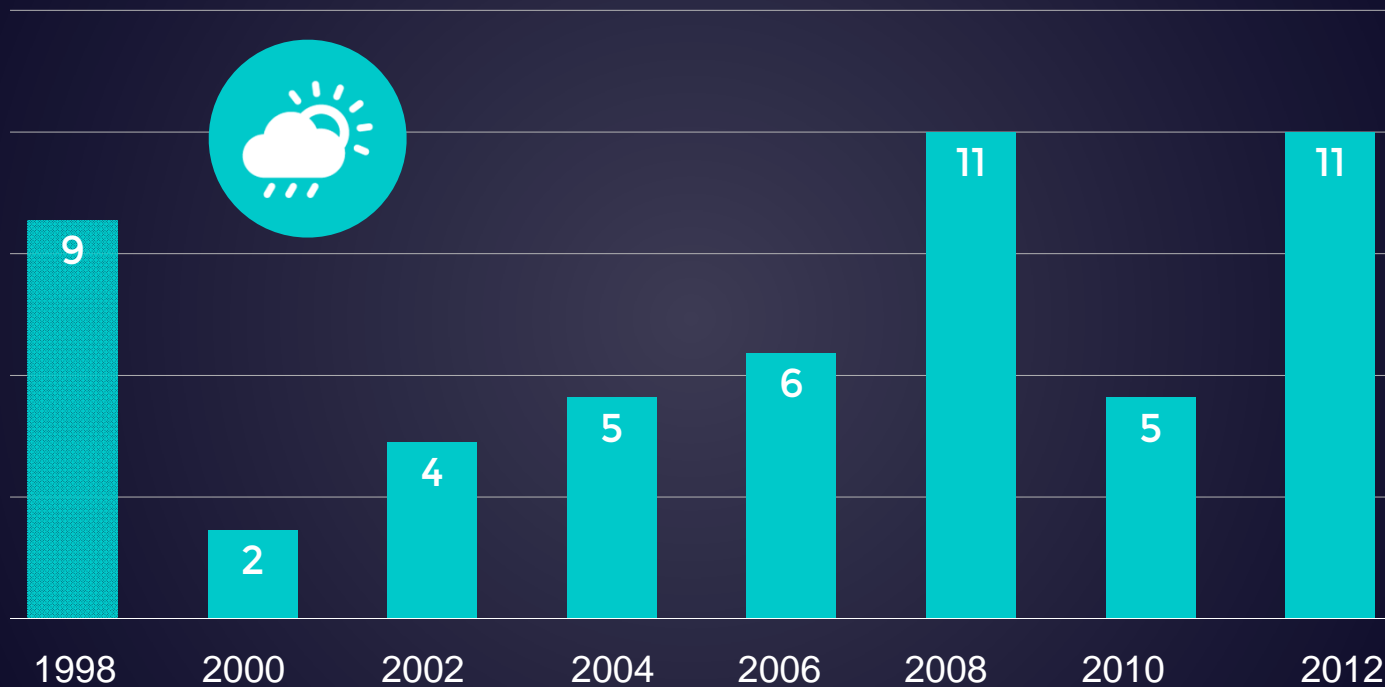
2





# CLIMATE CHANGE

Number of U.S. weather events (per year) costing **over \$1 Billion**



# CLIMATE CHANGE SIGNPOSTS

What to look for in the coming years.



## VITAL SIGNPOSTS

### **Population Growth:**

If global populations continue to boom, will technology come to the rescue?

### **Extreme Weather:**

Does increased rainfall and drought, alongside increased extreme weather events change how infrastructure is built?

### **Sea Level Change:**

Will rising waters in coastal areas alter where and how Americans live?



## VOLUME 3: TECHNOLOGY

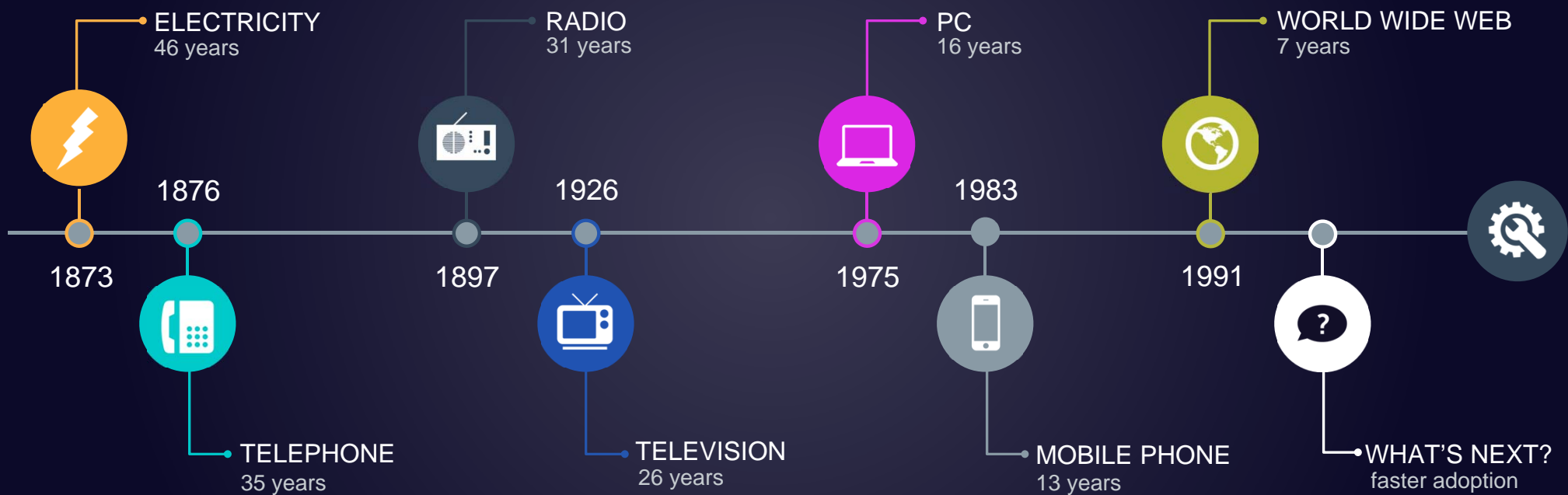
Select the right technology  
investments at the right time.

3



# TECHNOLOGY

Years until technology was used by one-quarter of Americans





# TECHNOLOGY SIGNPOSTS

What to look for in the coming years.



## VITAL SIGNPOSTS

### **Wireless Sensors:**

How might smart infrastructure change the frequency of maintenance cycles if schedules can be better optimized?

### **Remote Working Capabilities:**

Will the need for office space decline as secure file transfer needs increase? At what cost?

### **Vehicle Technology:**

How will worker safety and training be impacted?



## VOLUME 4: SUSTAINABILITY

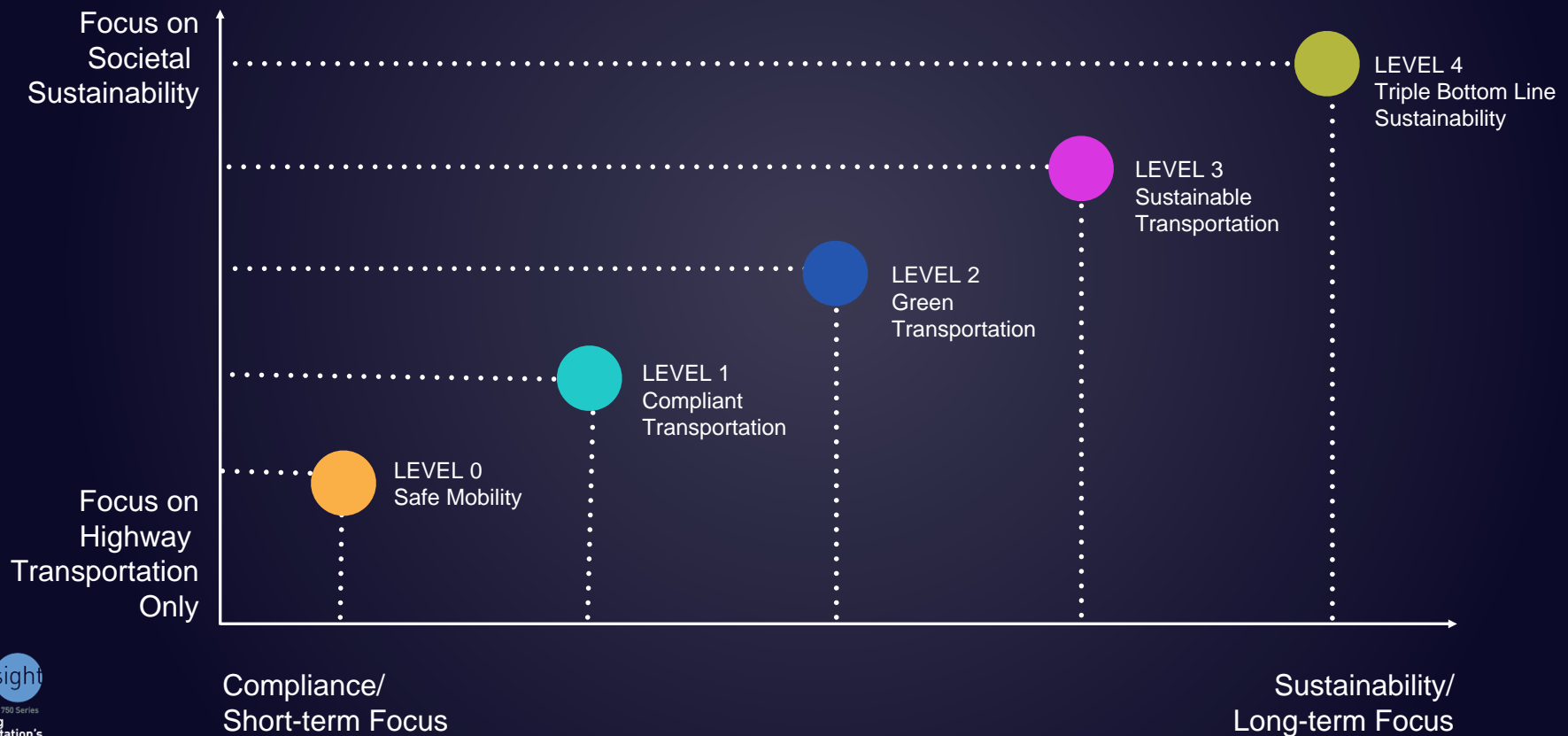
How to organize DOTs for a sustainable future.

4



# SUSTAINABILITY

A shift from short term needs to long term sustainability



# SUSTAINABILITY SIGNPOSTS

What to look for in the coming years.



## VITAL SIGNPOSTS

### **Population:**

Size, geographic distribution, and change in characteristics.

### **Economic Growth:**

Increase or decrease in U.S. GDP will be a major factor in resources available for transportation.

### **Energy:**

Changes in how cars fill-up change how DOT's are funded.

### **Technology:**

Innovations may alter how vehicles use transportation infrastructure.





## VOLUME 5: ENERGY & FUELS

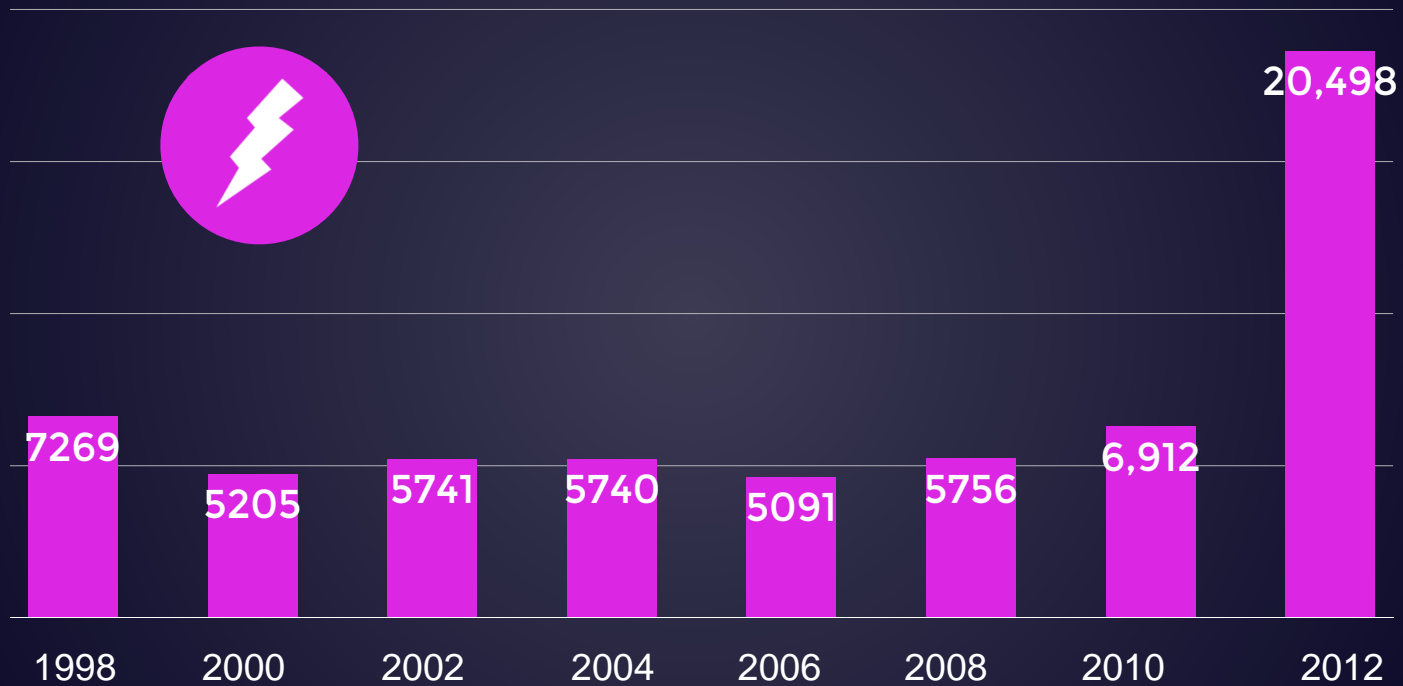
Identify and assess strategies  
for a variety of future energy  
scenarios.

5



# ENERGY & FUELS

## U.S. alternative fueling stations



# ENERGY & FUELS SIGNPOSTS

What to look for in the coming years.



## VITAL SIGNPOSTS

### **Technology:**

Does new fuel technology lead to fewer carbon emissions and less fuel consumption?

### **Driverless cars:**

How quickly do self-driving cars become the norm? Will they be safer? Will they increase fuel efficiency?

### **Costs:**

Will new fuel technology advances make personal vehicles more or less affordable? More cars? More transit?



## VOLUME 6 SOCIO- DEMOGRAPHICS

Model and envision the  
transportation impacts of  
shifting socio-demographics.

6





# SOCIO-DEMOGRAPHICS

## U.S. population by age group



More in U.S.  
older than 35,  
than younger.

**20.7 %**

35-49 years  
of age

**20.3 %**

20-34 years  
of age

**19 %**

50-64 years  
of age

**13.1 %**

65+ years  
of age

**26.9 %**

0-19 years  
of age

# SOCIO-DEMOGRAPHIC SIGNPOSTS

What to look for in the coming years.



## VITAL SIGNPOSTS

### **Life expectancy:**

As people live longer, how does a growing senior population affect transit needs?

### **VMT:**

With DOT budgets based largely on fuel tax, how do changing transportation needs affect VMT/fuel consumption?

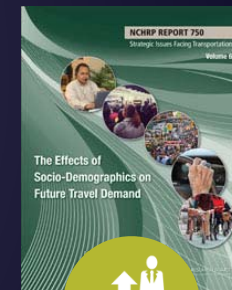
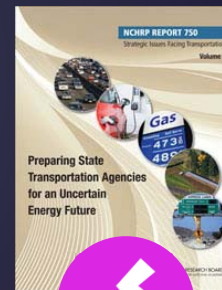
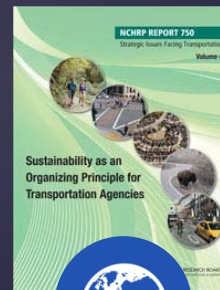
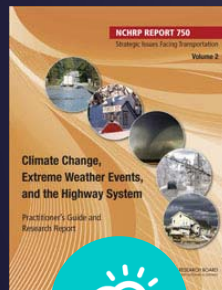
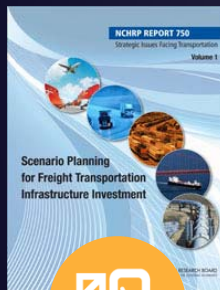
### **Immigration:**

Does immigration increase or decrease in the coming years? What will the transportation needs be for America's new additions?

# FORESIGHT 750 SERIES

Six reports designed to help you find future signposts

Visit [TRB.org/NCHRP](https://trb.org/NCHRP) and search for Report 750 to find and read all six reports in the Foresight Series.





**THANK  
YOU**



**See you in the FUTURE!**