



NCHRP Report 750 Series

**Informing  
Transportation's  
Future**

# WE LIKE **IKE**

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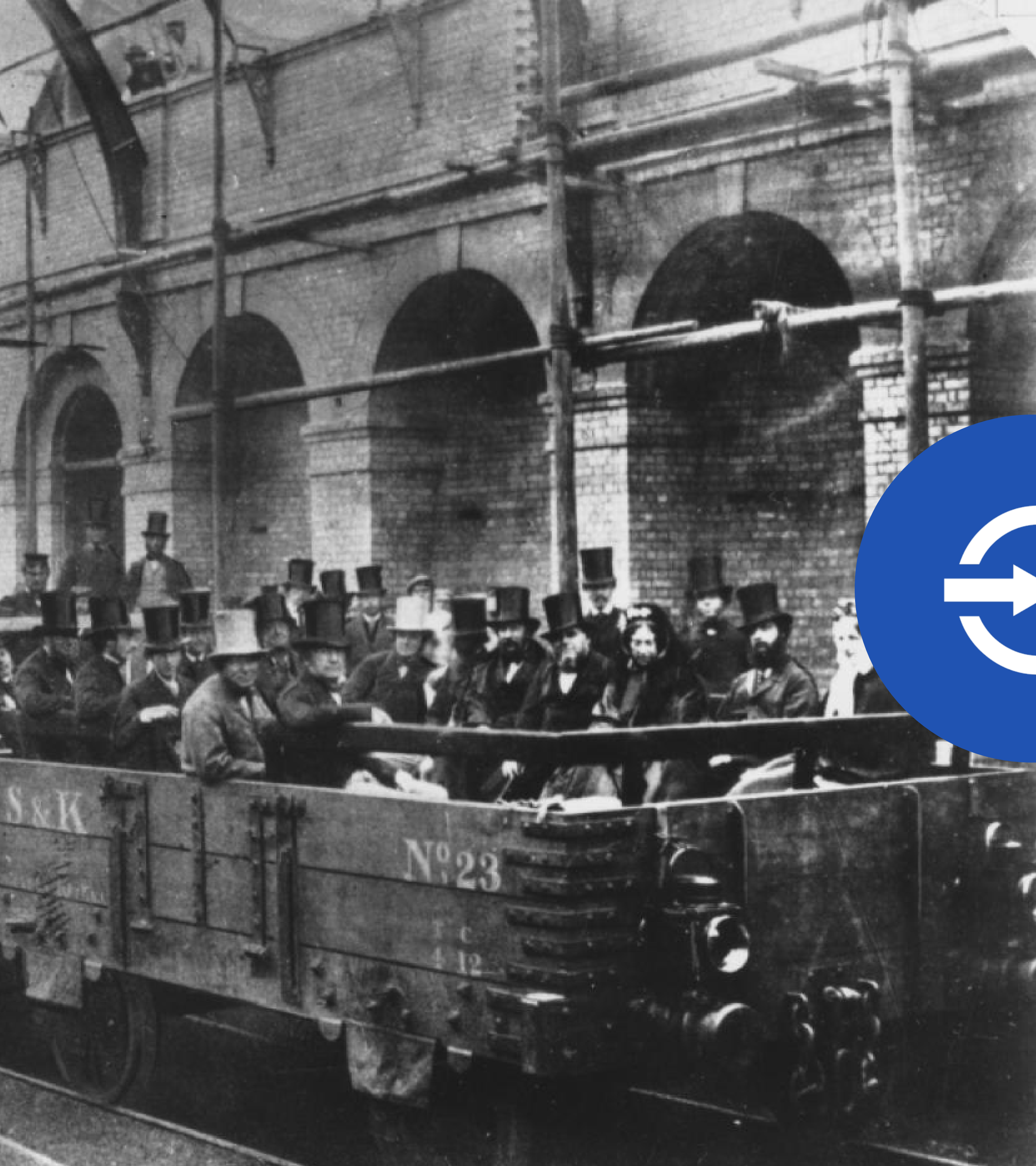


“If progress is to be steady we must have long term guides extending far ahead.”

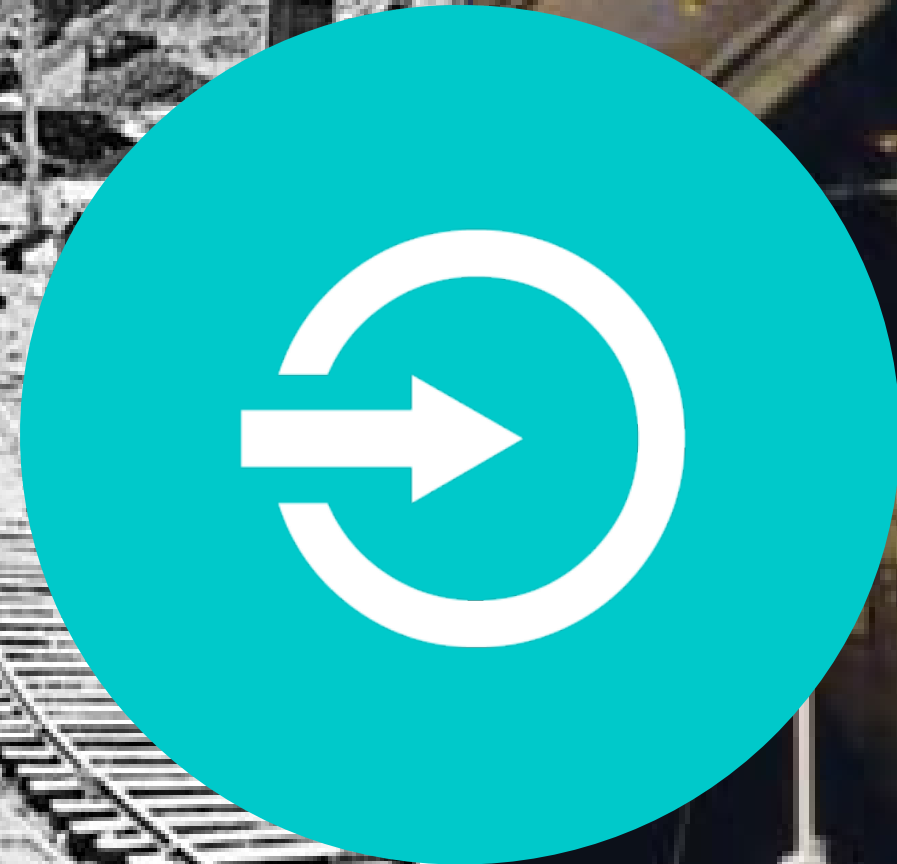
# WHY DO WE PLAN FOR THE FUTURE?

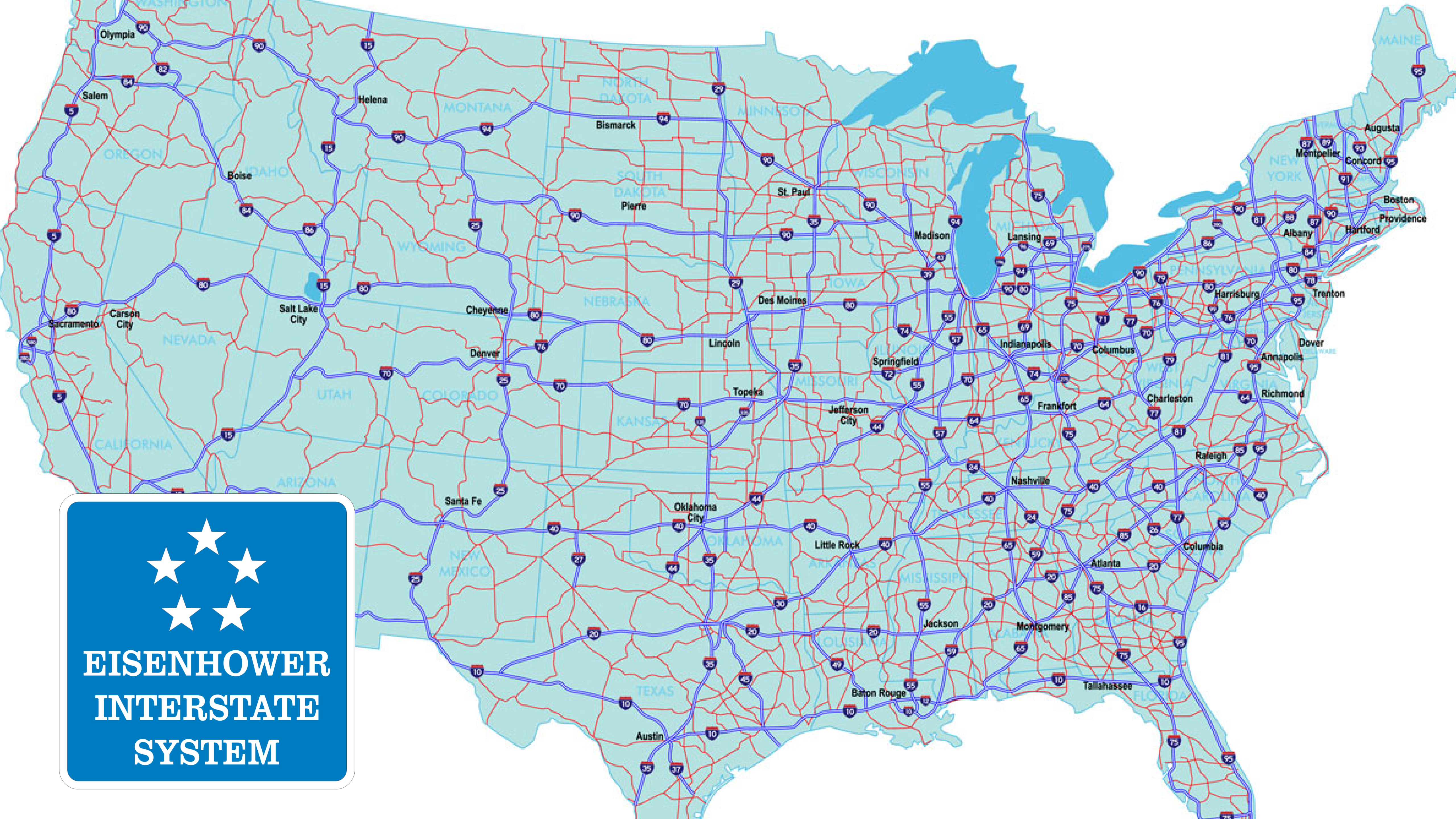
Does it really make a difference?











  
**EISENHOWER  
INTERSTATE  
SYSTEM**

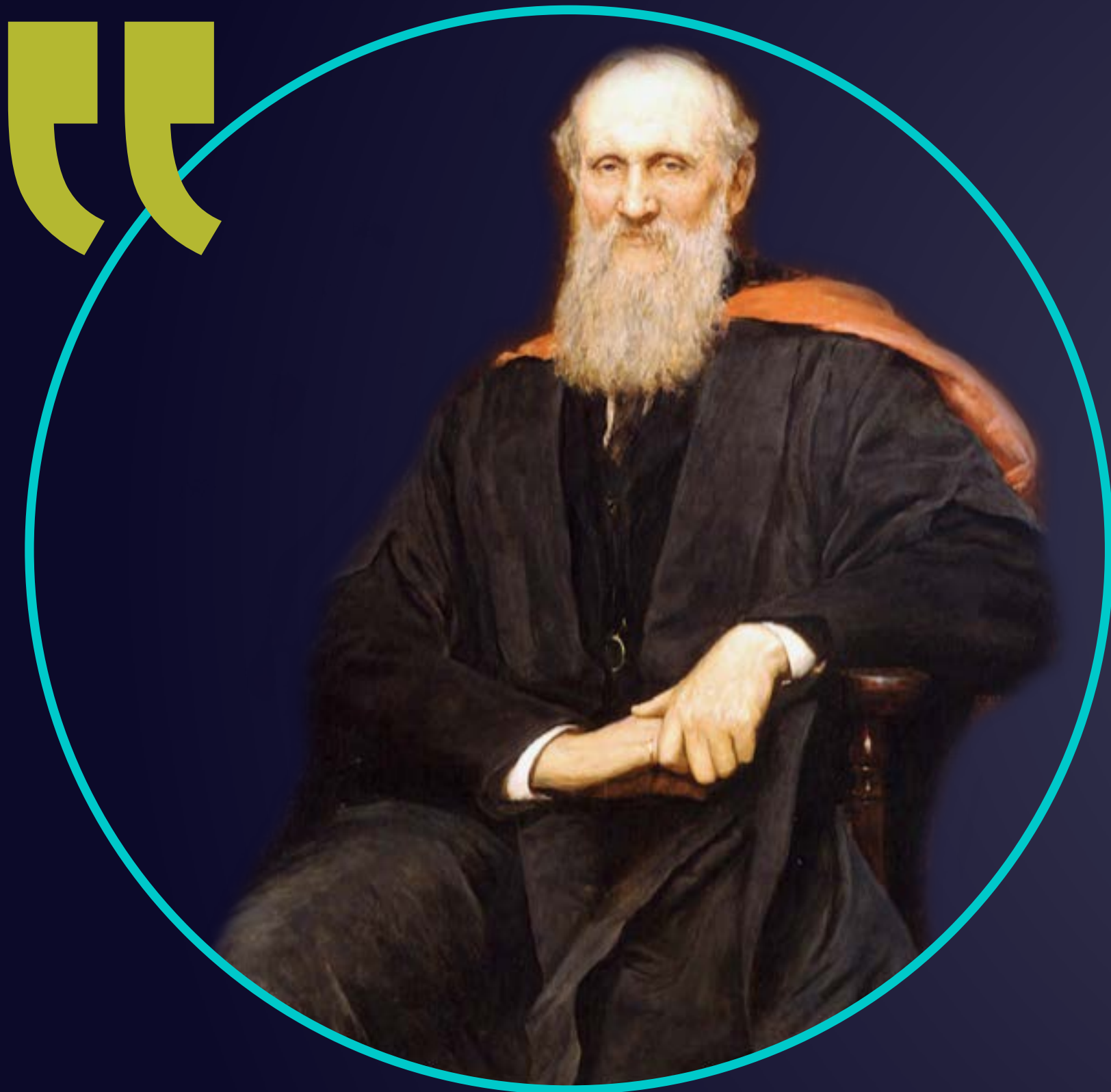
# IT'S EASY TO GET THE FUTURE WRONG

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



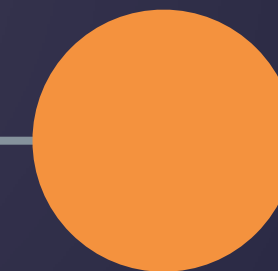
## POINT FORECAST

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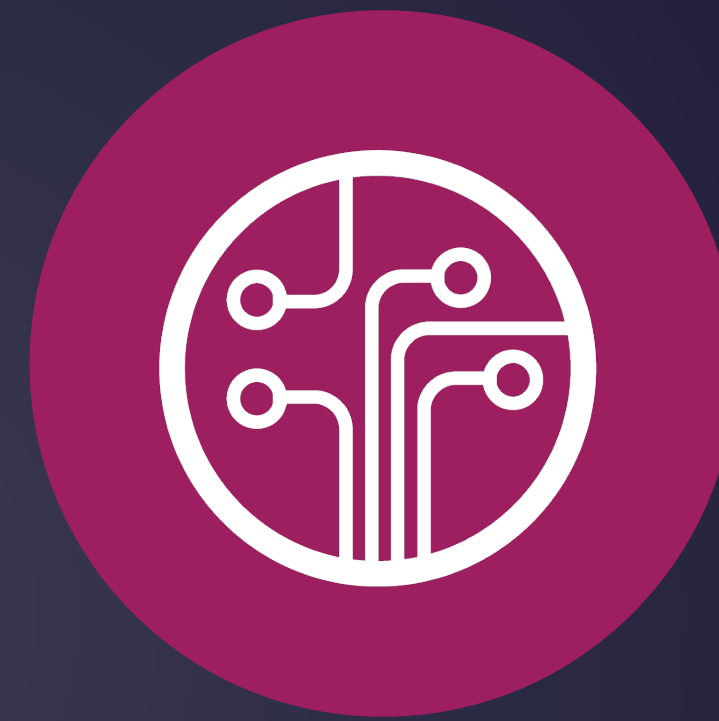
America gets older and more diverse.  
Global trade booms.  
Domestic growth flattens.



## GLOBAL CHAOS

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



## TECH TRIUMPH

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



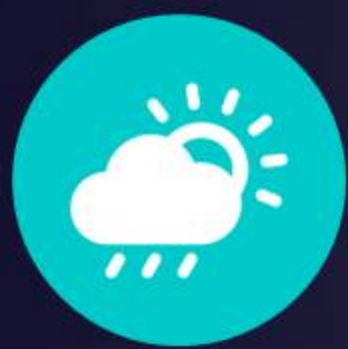
## GENTLE FOOTPRINT

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

# 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.

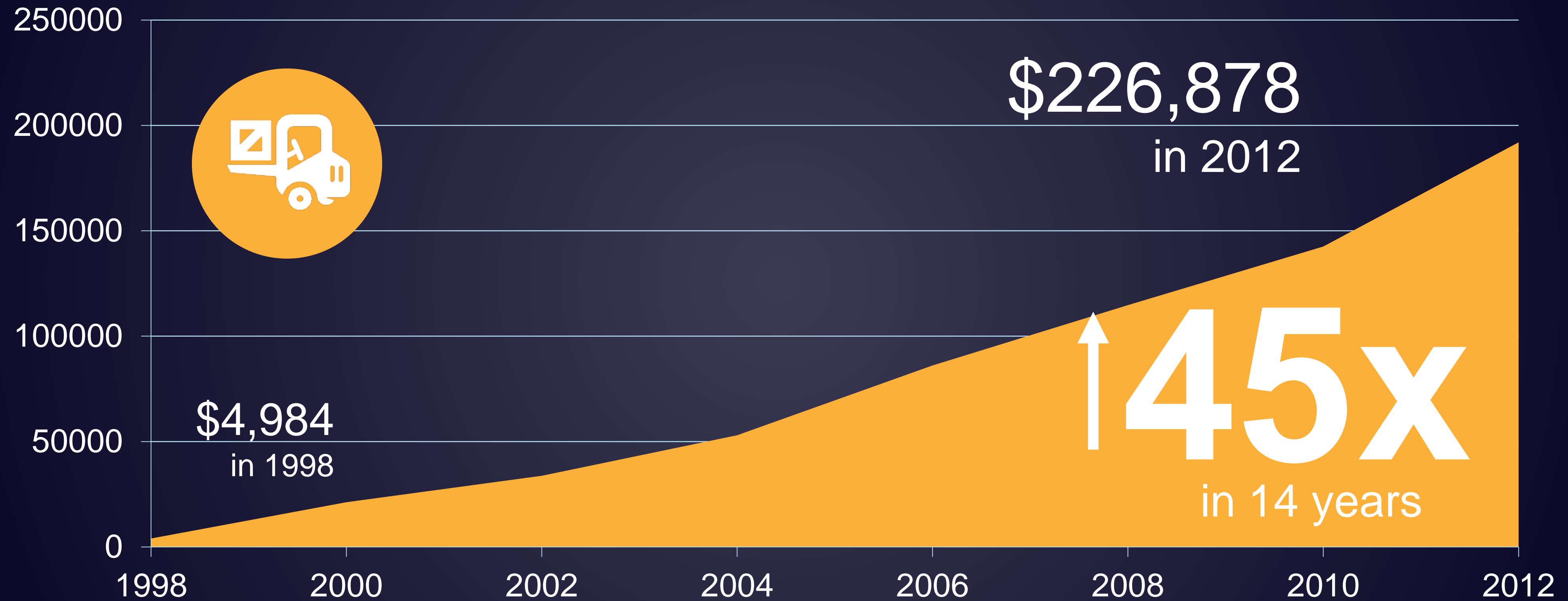
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# FREIGHT

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

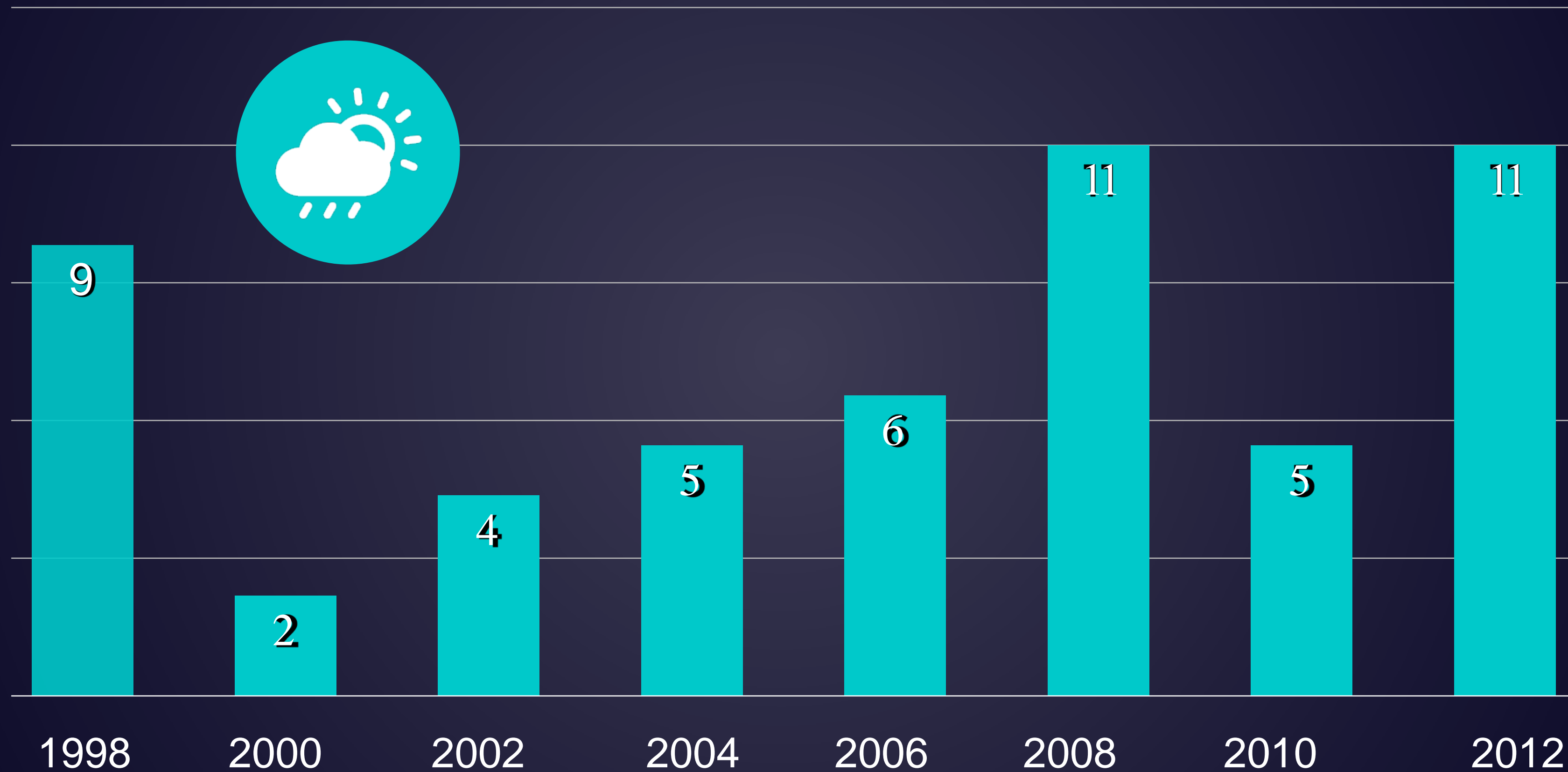
How to prepare for extreme  
weather events.

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.

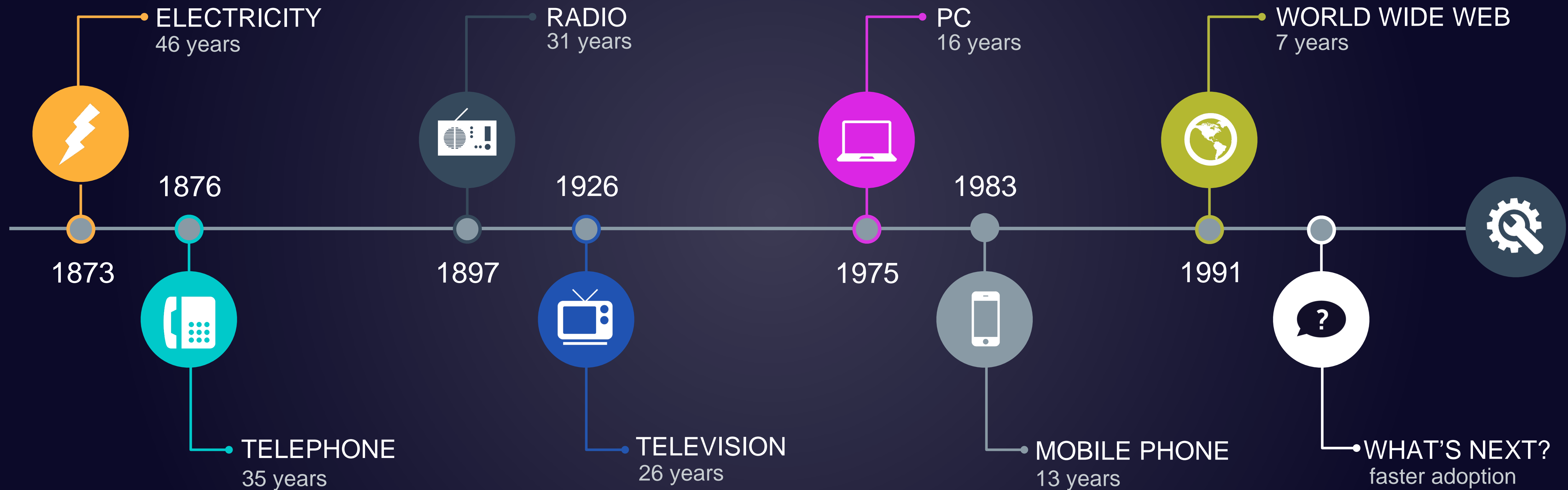
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# TECHNOLOGY

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.

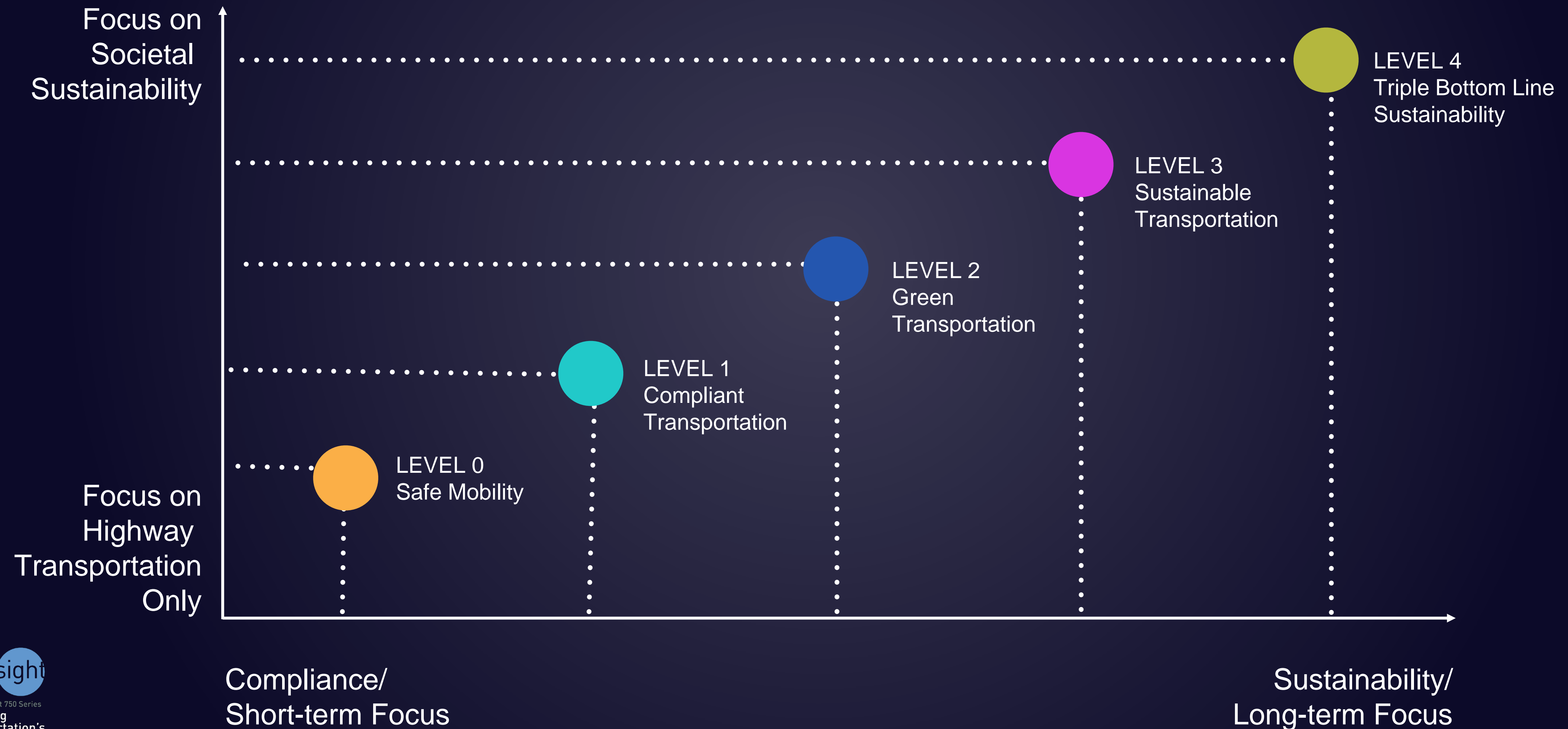
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# SUSTAINABILITY

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.

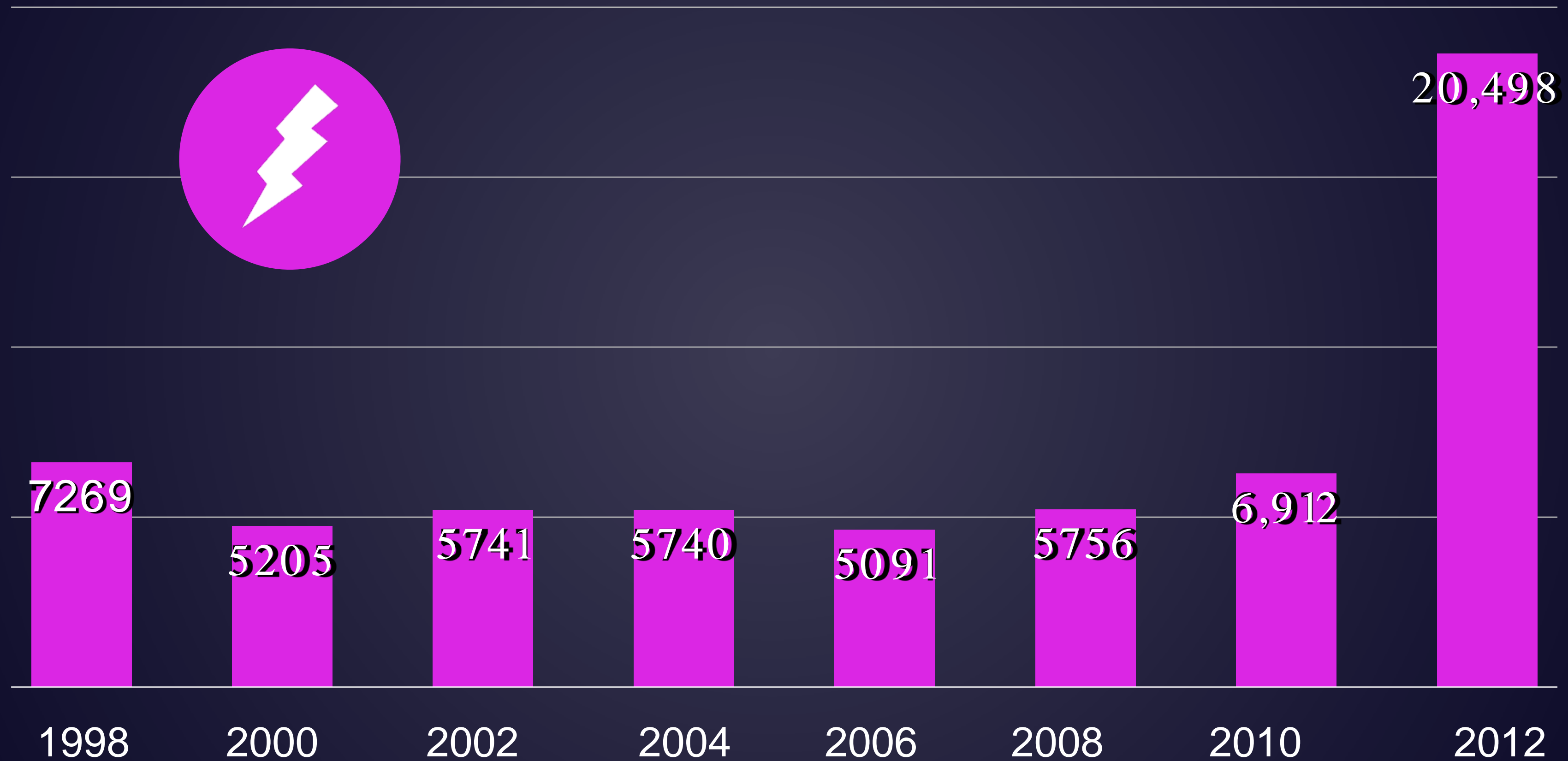
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# ENERGY & FUELS

## 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?

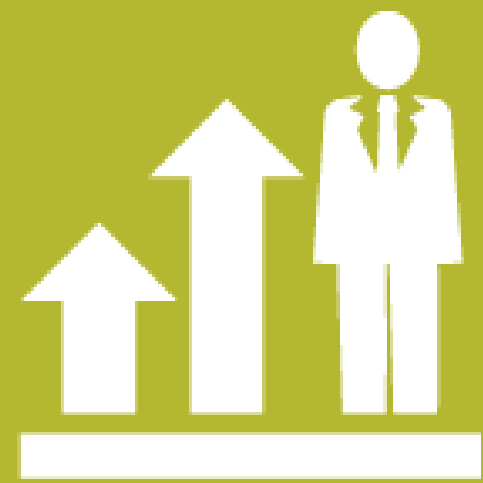
### Driverless cars:

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.

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# 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:**

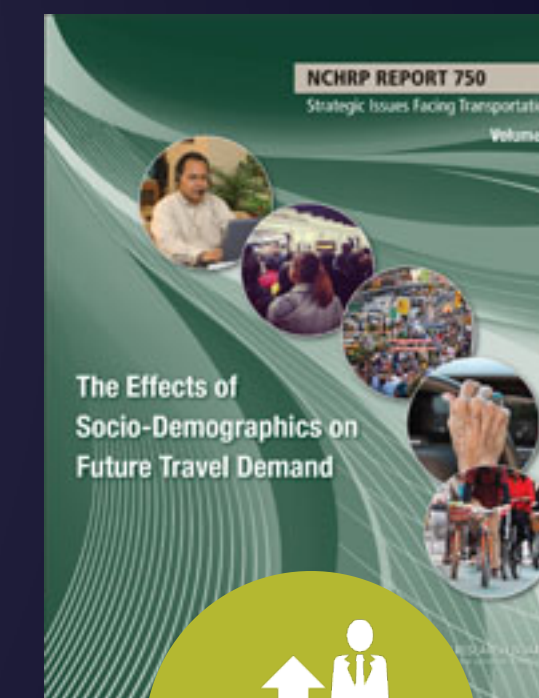
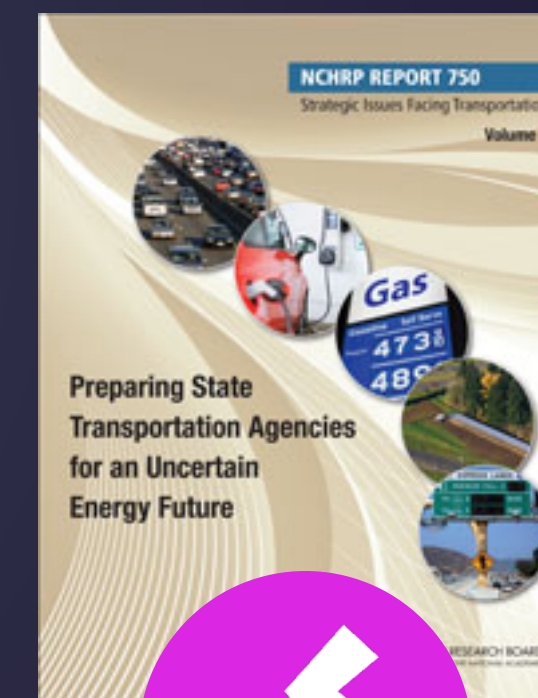
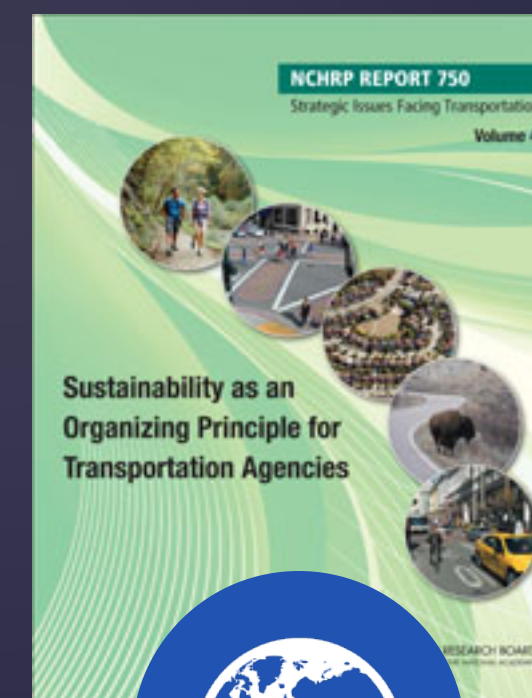
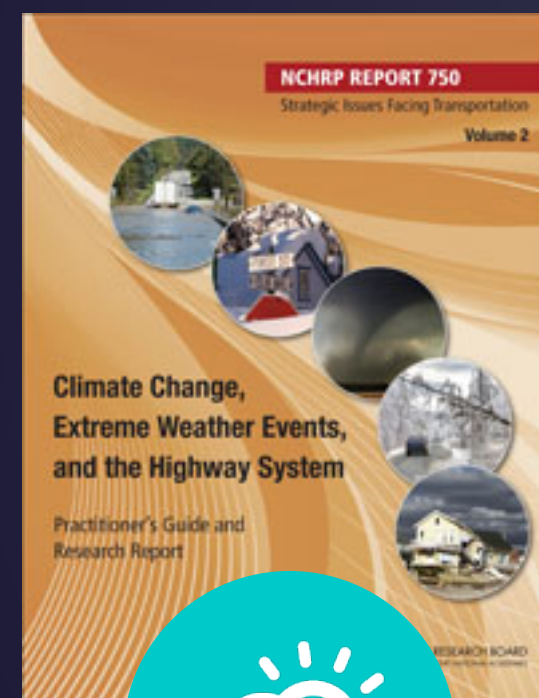
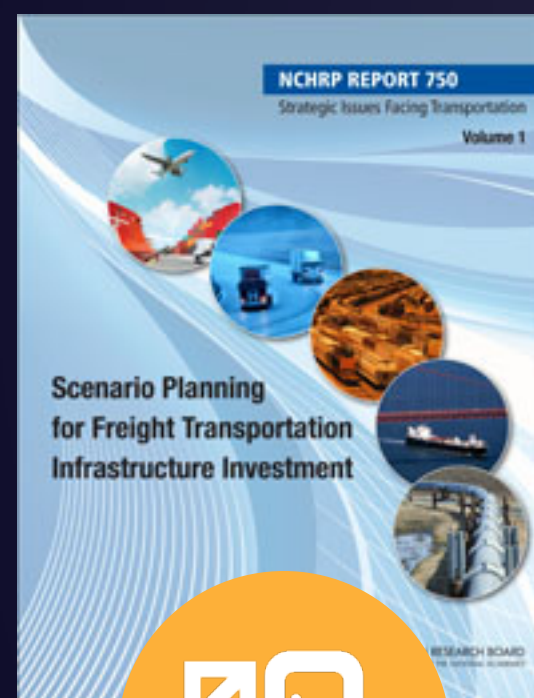
Does immigration increase or decrease in the coming years? What will the transportation needs be for America's new additions?



# FORESIGHT 750 SERIES

Six reports designed to help you find future signposts

Visit [TRB.org/NCHRP](https://www.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!