

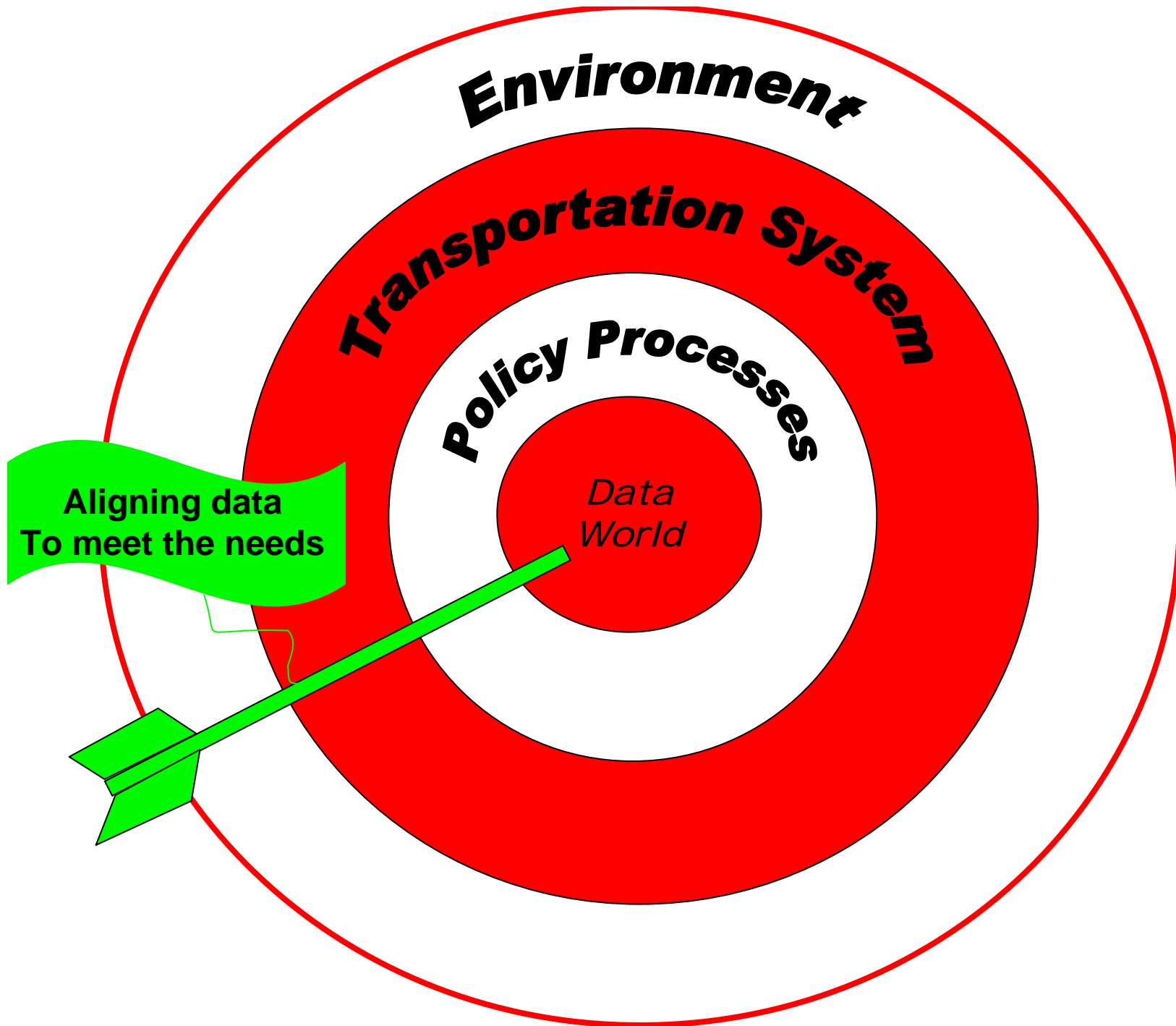
Aligning Data to Support Transportation Decisions

Emerging Challenges & Opportunities for the Data World

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Northwestern University

Transportation Research Board – AASHTO Peer Exchange
May 15-16, 2008



Some Looming Issues

- Environment
 - **Energy** – enough & at what price?
 - **Economy** & competitiveness – demands on transportation
 - **Climate change** – not so far off
 - Natural **environment** – a serious issue
 - **Technology**: fuel, propulsion, vehicles, communications...
- The transportation system
 - **Finance** – paying the bills
 - **Privatization**, pricing & contracting
 - **Performance**: capacity, reliability, safety
 - **Condition**: aging, crumbling
 - **Freight**: congestion, costs, environmental impacts
- Policy processes – some emerging wisdom
 - **Accountability** & transparency
 - **Allocating resources** wisely – B-C analysis
 - **Informed decision making** – information support
 - **Change** is coming – can it be opportunity?

Sustainability

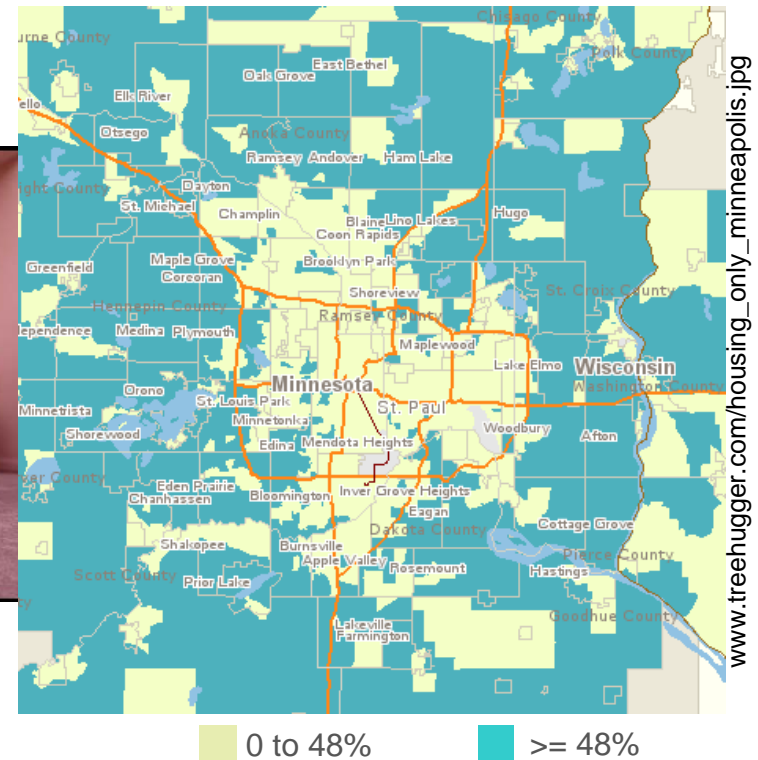


**Data:
Foundation for
Action**

Energy Cost and Availability



Housing and Transportation Costs as Percent of Income



Impacts, Implications?

- ✓ Decisions?
- ✓ Essential data elements?

Energy, Fuel Consumption & Travel

- Traveler/shipper responses? – now & future
 - Mode choice
 - Vehicle use: SUVs used more (NHTS)
 - Fleet mix trends
- VMT trends, expectations & implications
 - Travel
 - Accessibility
 - Revenues
- Technology
 - Responding to change
 - Leading change



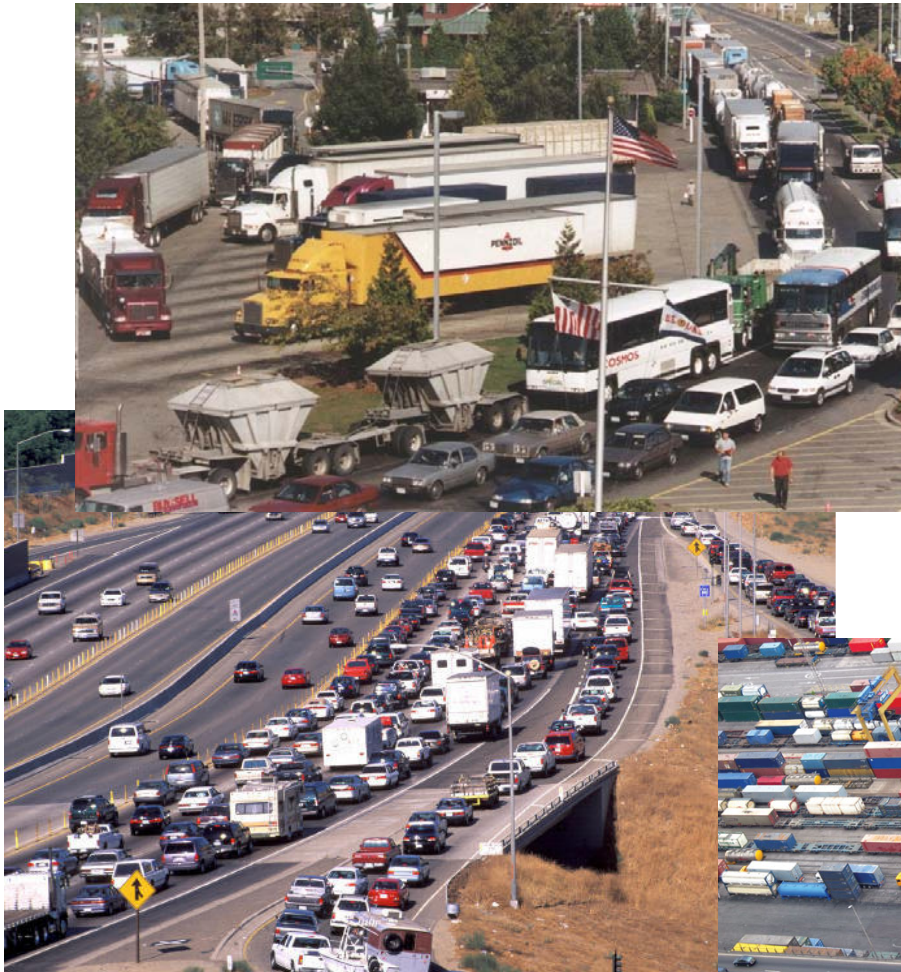
...At Ford quantity is job one...

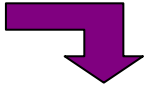


Aerorider

Economic Strength & Competitiveness

Transportation as Backbone, Stimulus

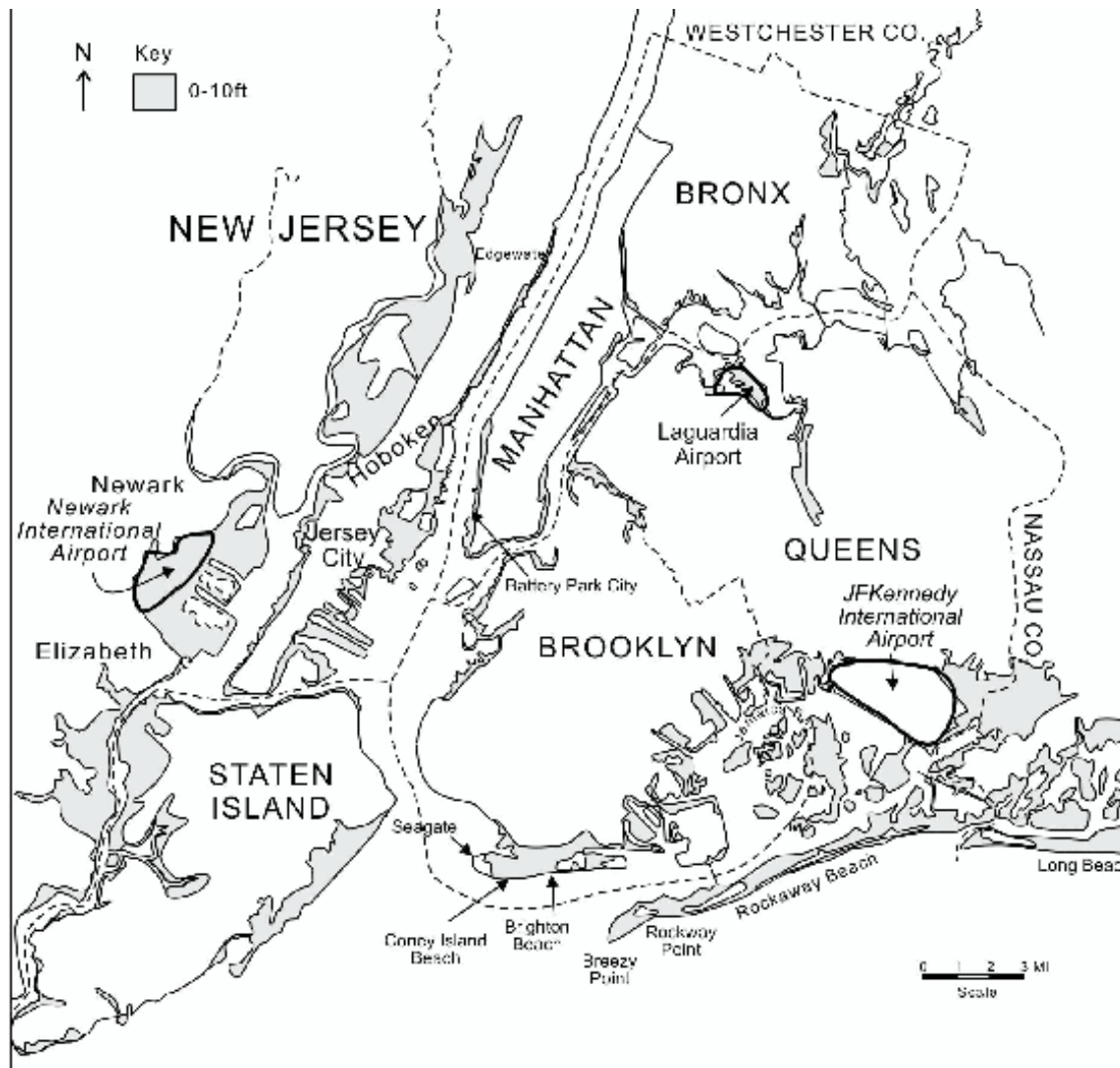


- Coverage
 - Capacity
 - Reliability
- 
- Investment priorities
 - Policy implications

- ✓ Decisions?
- ✓ Essential data elements?

Climate Change – Long Term View

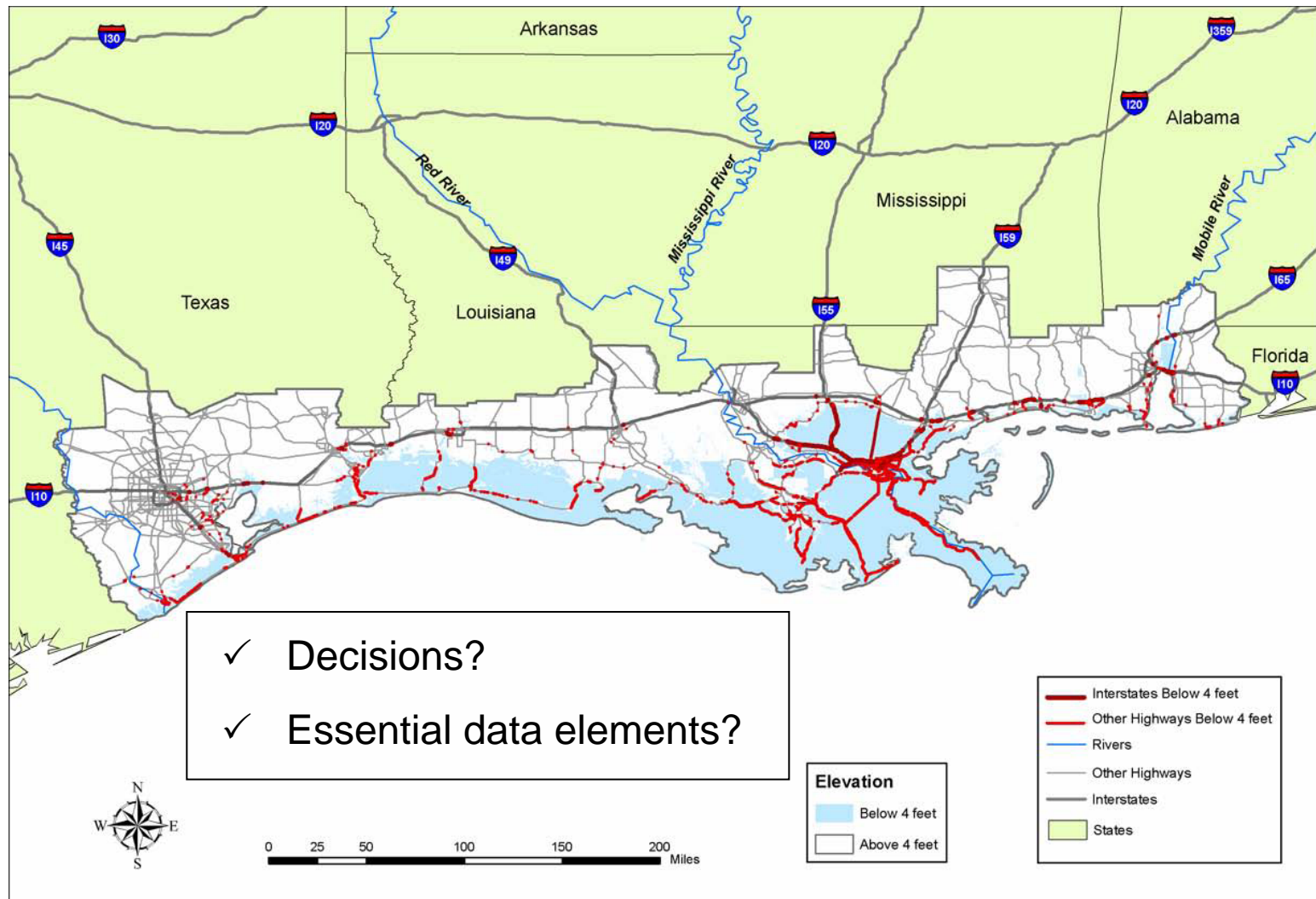
Potential Impacts of Climate Change on U.S. Transportation (TRB SR 290)



Recommendation 1: Federal, state and local governments, in collaboration with owners and operators of infrastructure, such as ports and airports, and private railroad and pipeline companies, should inventory critical transportation infrastructure in light of climate change projections to determine whether, when, and where projected climate changes in their regions might be consequential.

Climate Change

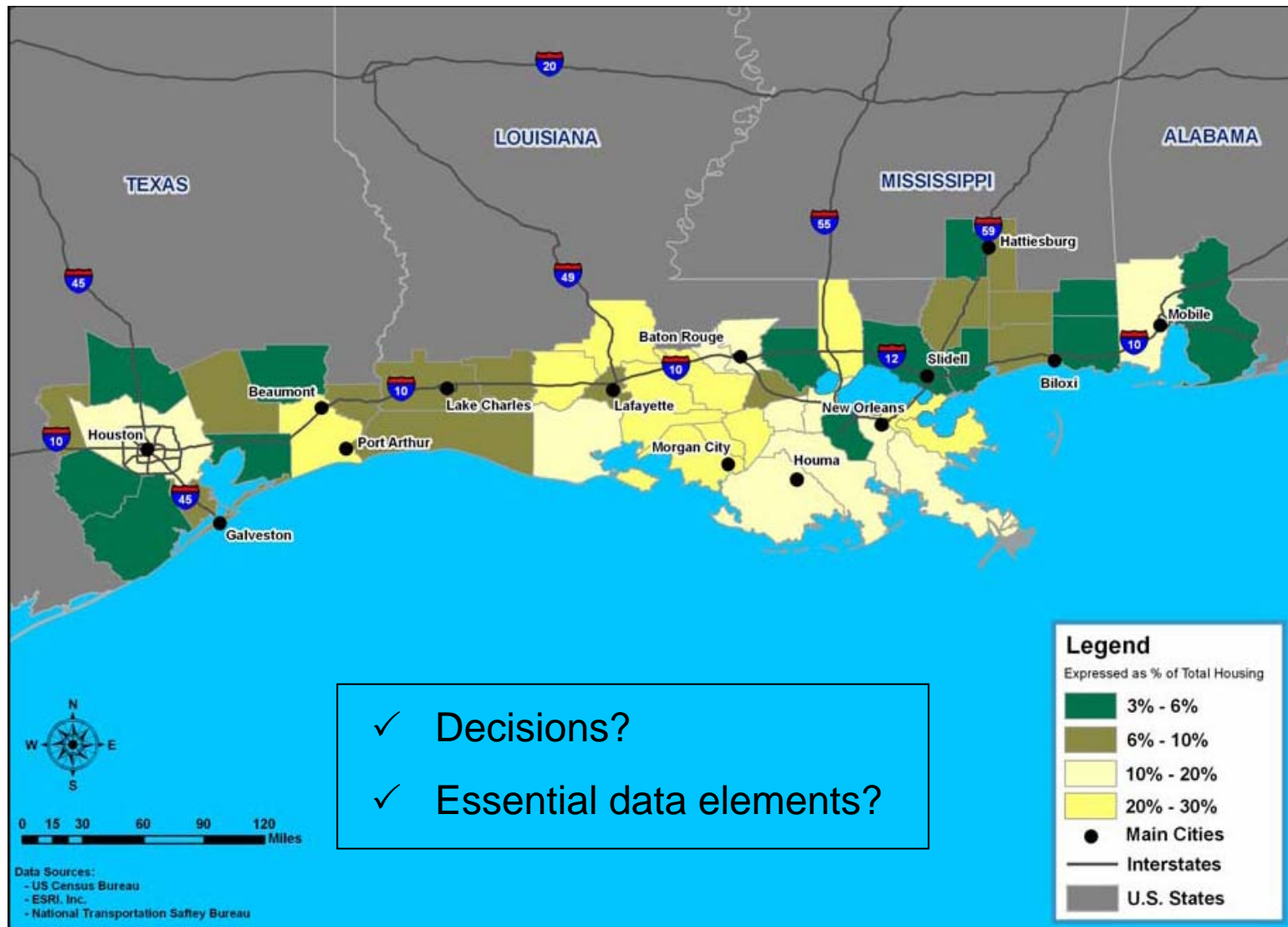
Highways at Risk from 4' Relative Sea Level Rise - CSI & USDOT



<http://www.climatechange.gov/Library/sap/sap4-7/final-report/>

Getting Ready for the Next Big One

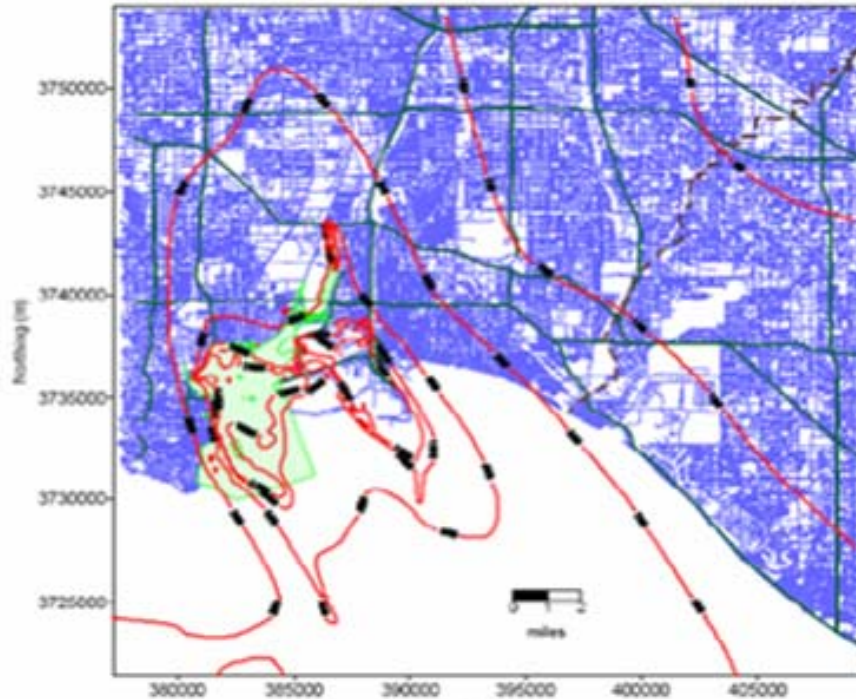
Percent of HHs with No Motor Vehicle



- ✓ Decisions?
- ✓ Essential data elements?

Transportation and the Natural Environment - Now

Figure 1
Estimated Diesel PM Cancer Risk from POLA and POLB



Peter Greenwald Senior Policy Advisor South Coast Air Quality Management
TRB Workshop: Data for Goods Movement Impacts on Air Quality 3/17/08



- ✓ Decisions?
- ✓ Essential data elements?

Technology Trends

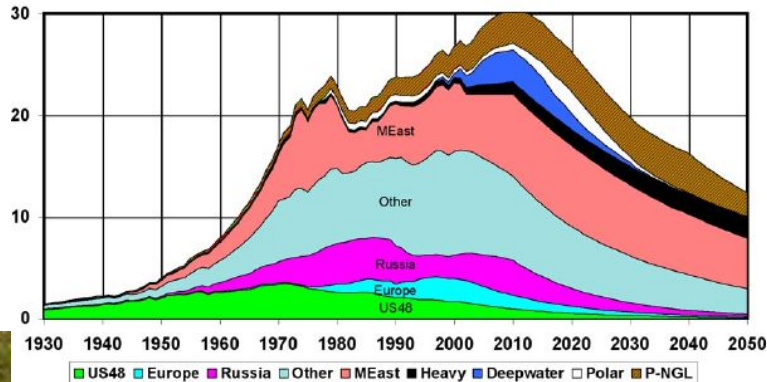
- Transportation system
 - Vehicles, fuels, ITS
- Data management
 - Automation, real time data, privacy, managing & mining the data mountain
- Decision making
 - Communications, display engagement, transparency



- ✓ Decisions?
- ✓ Essential data elements?

Sustainability – What Does it Mean for Transportation & Data?

Regular Oil & Natural Gas Liquids
2003 Base Case Scenario



- Extending the view in time and resources
 - Reducing the discount rate
- Scarce resources
 - Energy
 - Materials
 - Land
 - Environment
 - People



- ✓ Decisions?
- ✓ Essential data elements?¹²

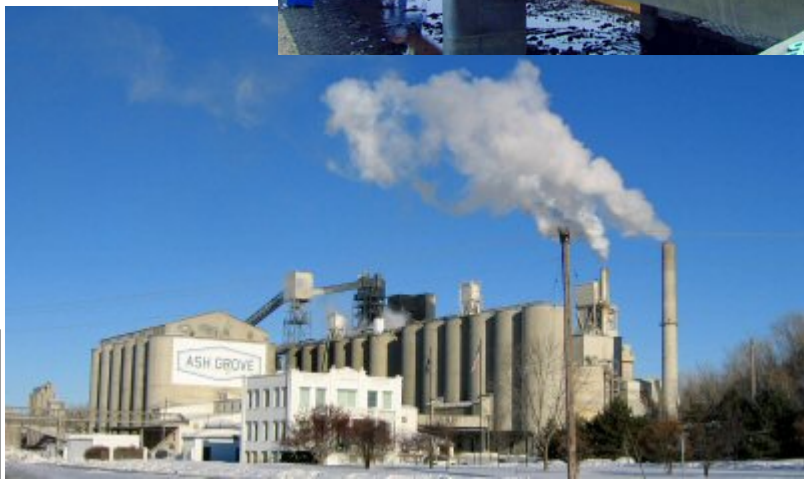
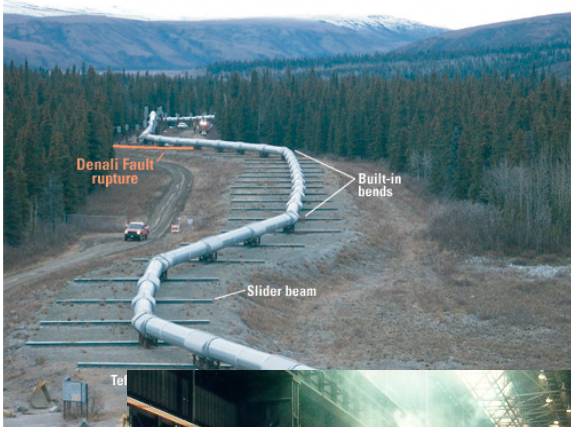
Financing the Transportation Enterprise

The Heart of Reauthorization



- ✓ Decisions?
- ✓ Essential data elements?

Competition Raises Resource Costs But Revenues Are Flat



- ✓ Decisions?
- ✓ Essential data elements?

Privatization – What's It Got to Do With Data? Contracting is Data Hungry



- Valuing the asset
- Monitoring condition & performance
- Managing uncertainties
- Structuring end games



- ✓ Decisions?
- ✓ Essential data elements?

Transportation System Performance

Customers feel this first

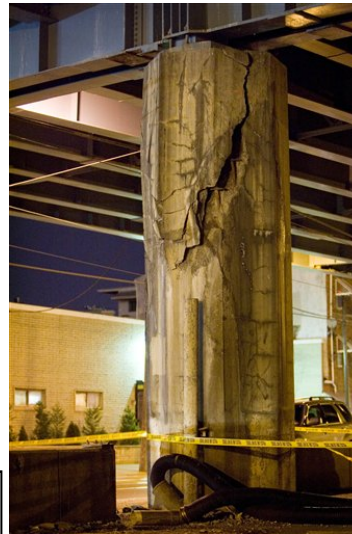
- Travel time
- Reliability
- Resilience
- Safety
- Security

- Real time
- Operations
- Trends
- Investment



- ✓ Decisions?
- ✓ Essential data elements? 16

Infrastructure Condition



- ✓ Decisions?
- ✓ Essential data elements?

- Condition data
- Structural Health Monitoring
- Making data useful for decisions
- Managing systems

Freight, Trade, Congestion & Competitiveness



Queen's Printer for Ontario, 2004

- No longer a step child
- Status & trends important to all
- Private data
- Data partnerships

- ✓ Decisions?
- ✓ Essential data elements?

Policy Studies Offer Guidance

- National Commissions
 - Surface Transportation Policy & Revenue Commission
 - Surface Transportation Infrastructure Financing Commission
- Eddington Report (UK)
- Global warming studies
- Bi-Partisan Study Commission
- Are we getting smarter?
 - Information can be influential in times of change



Policy & Revenue Commission Study

- Value of good transportation
- Performance-base management
- Continuing Federal role
 - Reorganization of programs
 - Objective basis for decisions – B/C
 - National Surface Transportation Commission (NASTRAC)
- Indexed user fees, road pricing
- Will the minority report doom the study?

ARE WE RIPE FOR REFORM?

When, on April 5, 1955, Richard J. Daley was elected Mayor of Chicago, defeating 2-term reform Mayor Martin Kennelly, ...”
Alderman Paddy Bauler danced a jig and uttered his famous pronouncement, "Chicago ain't ready for reform!" NYT

AND WILL WE HAVE THE DATA NEEDED TO SUPPORT IT?

The Eddington Transport Study

The case for action: Sir Rod Eddington's advice to Government

- Transport & economic development
- Environmental impacts
- Congestion & delays – need to improve performance
- Target urban areas, existing systems – high payoffs
- Pricing is critical
- Select well (B-C), implement efficiently – streamlining
- Environmental sensitivity



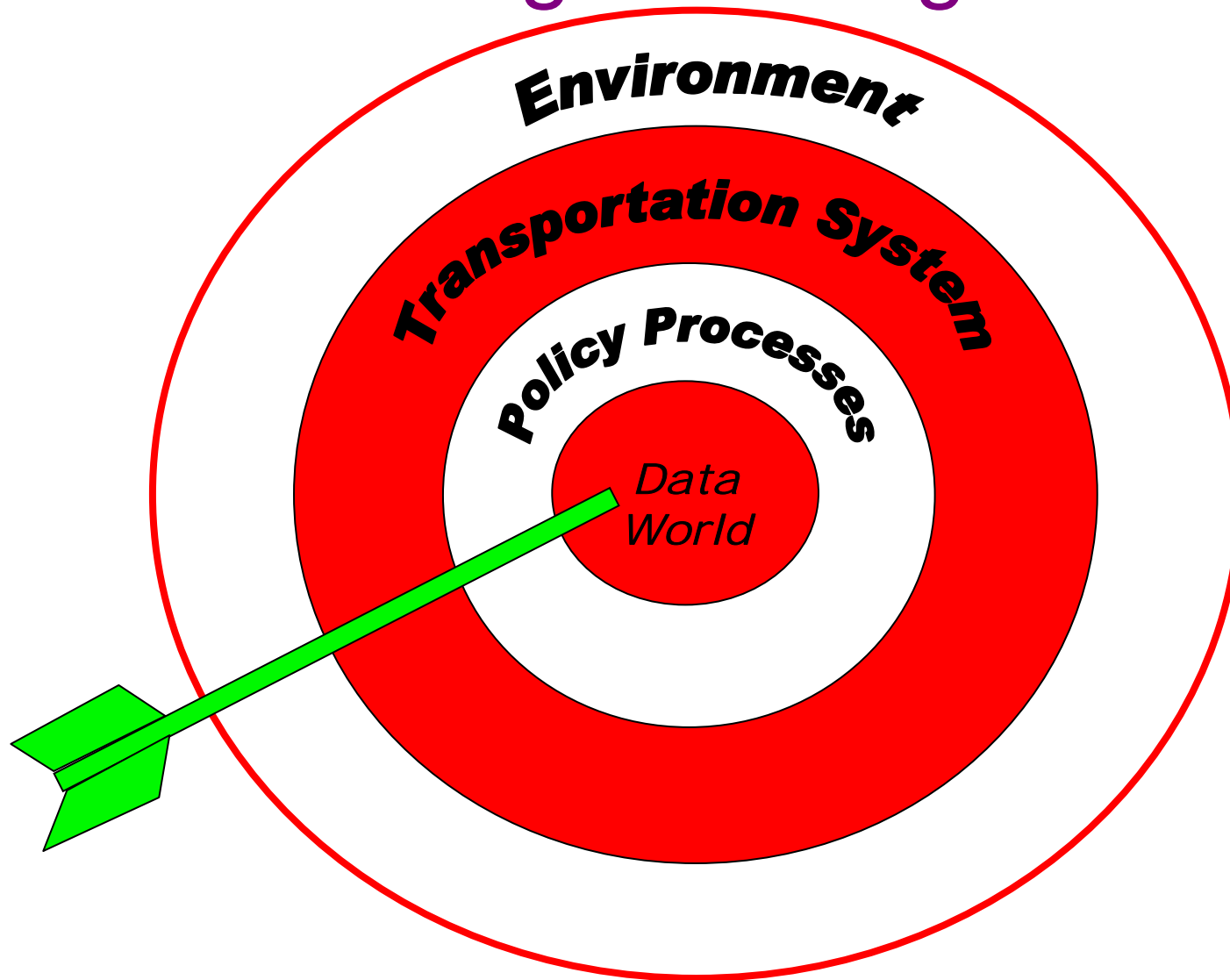
Tensions in Decision Processes



**Data can play a key role in
sorting out strategic choices**

- Short vs long term perspective
- Now technology vs. new technology
- Freight vs. passenger
- Urban vs. intercity needs
- POVs vs. transit
- Transportation vs. all other important stuff

When framing data programs Don't Forget the Big Picture



Be Prepared

Nothing beats having the data when it is needed

- Can't always know the next big thing
- Decision makers use what's at hand
- Right data can frame the debate, balance political forces
- Change is accelerating
- It's good to look ahead

