Policy Challenges in Metropolitan Regions Implications for Transportation Modelers and Model
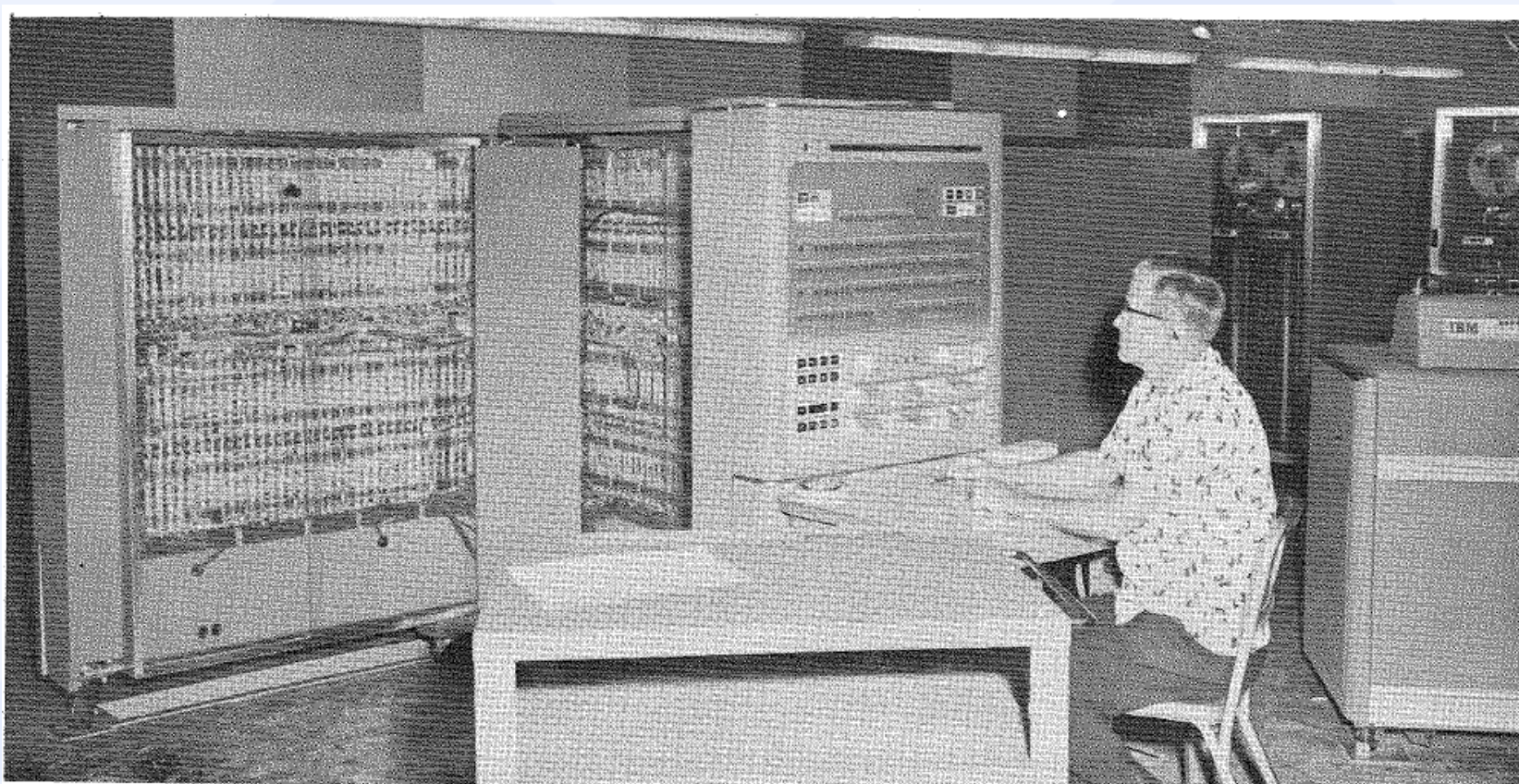
Innovations in Travel Modeling
May 10, 2010

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GOVERNMENTS

ON THE MOVE
PARTNERS IN PROGRESS

Confessions of a reformed modeler

IBM 704 – Electronic Computer central panel used for tabulating the Survey data.

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We are Faced with Rapid Change & Increasing Complexity
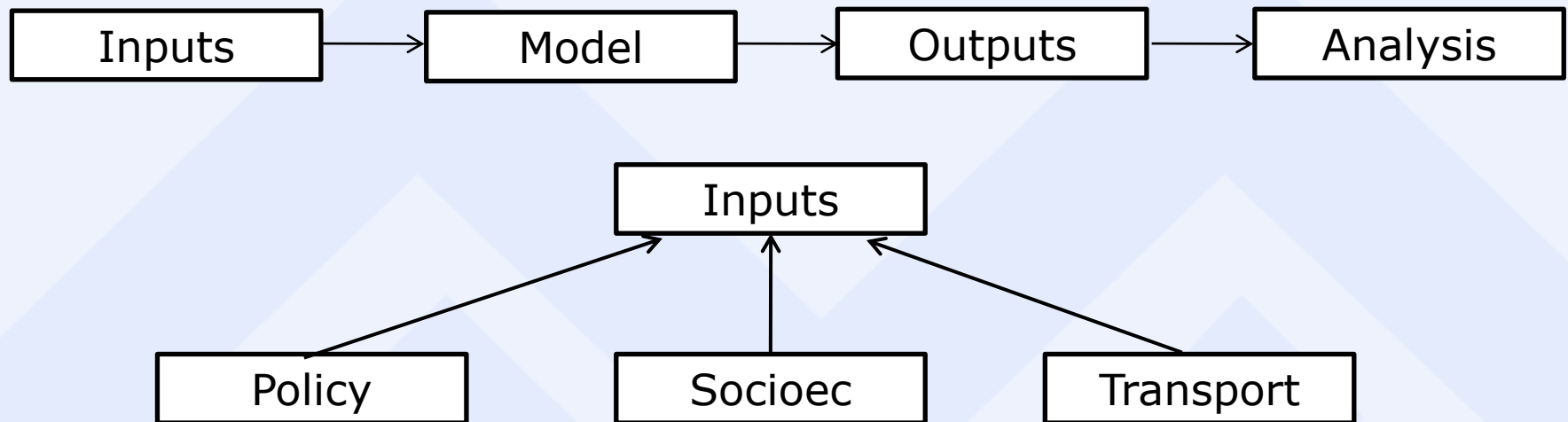
- **Policy Questions**
  - More complex
  - Significance of decisions
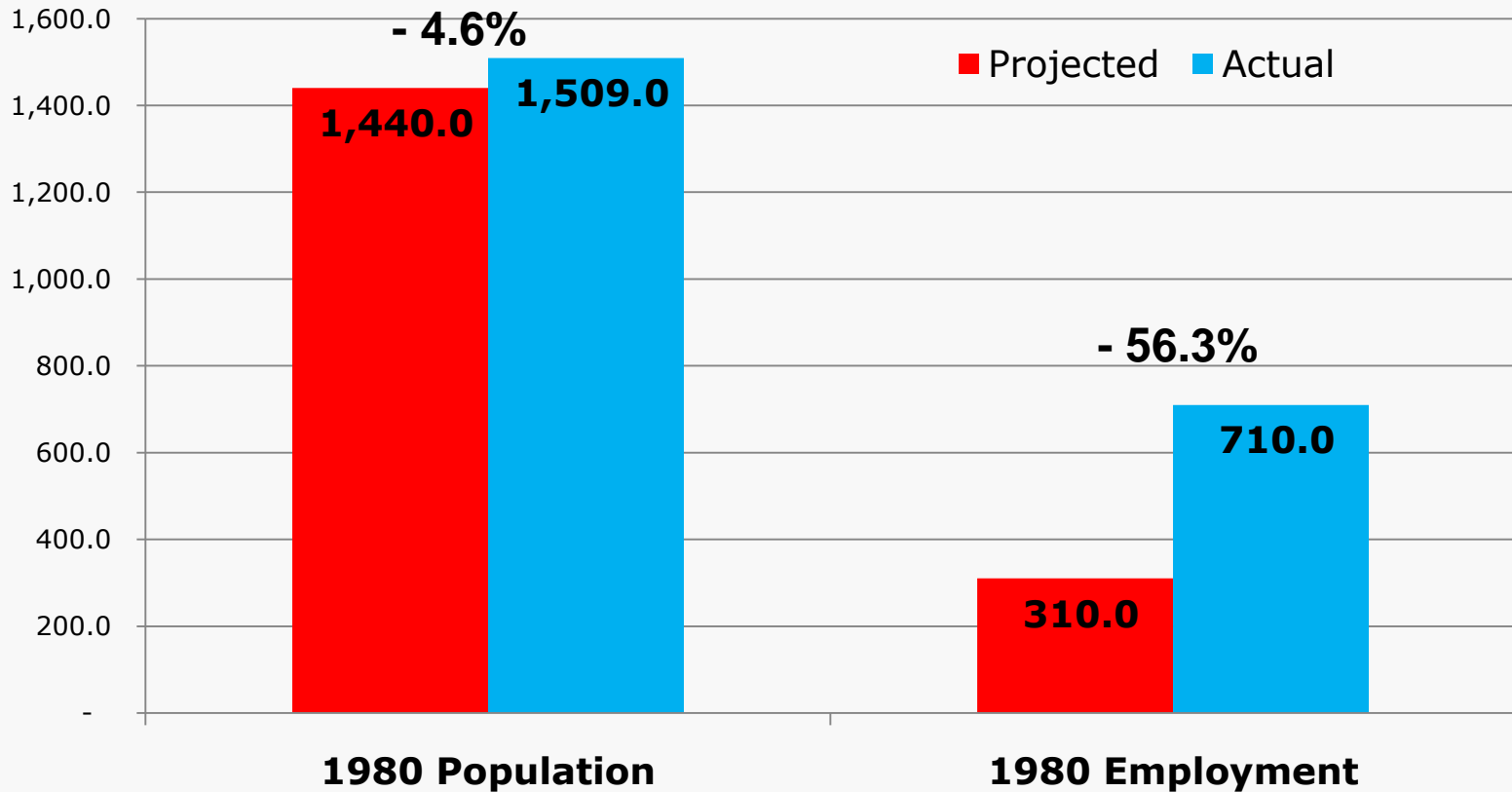- **Technology**
  - Computer access & capability
  - Data collection
- **Models**
  - Bigger with more components
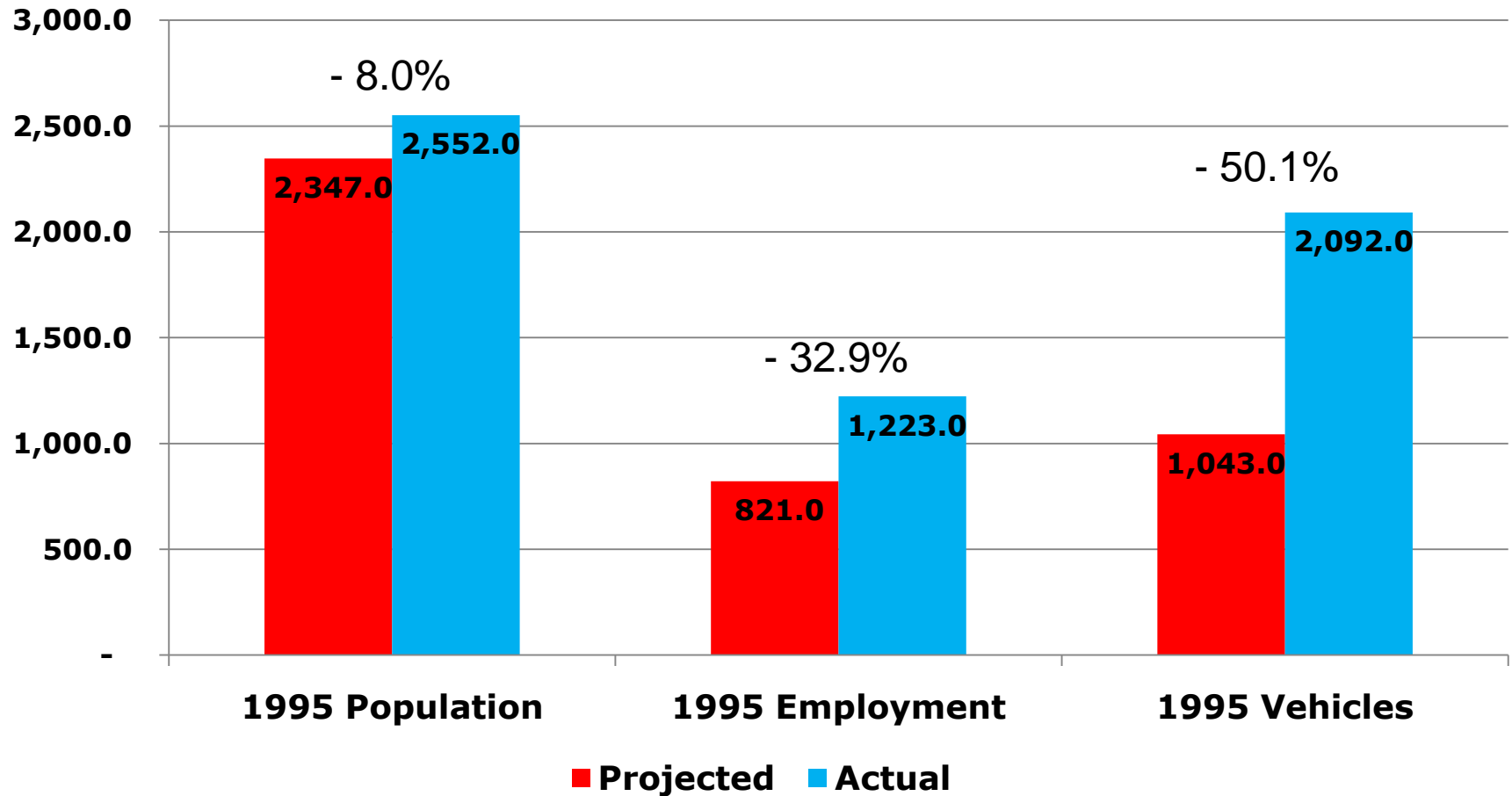 - Larger & more active research community

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Inputs → Model → Outputs → Analysis

Inputs

Policy   Socioec   Transport

Socioeconomic Inputs

1960 Wilbur Smith Plan

Socioeconomic Inputs

1970 Population & Socioeconomic Factors Report

Chart: Projected vs Actual values

- **1995 Population**: Projected 2,347.0, Actual 2,552.0 (- 8.0%)
- **1995 Employment**: Projected 821.0, Actual 1,223.0 (- 32.9%)
- **1995 Vehicles**: Projected 1,043.0, Actual 2,092.0 (- 50.1%)

Legend: ■ Projected ■ Actual

Potential Future Travel Demand Requirements

Metropolitan Phoenix

Expected Population: 4 million
Expected Households: 1.5 million

Hassayampa Valley
Expected Population: 3 million
Expected Households: 1.1 million
Estimated Trips: 8.8 million
Regional Freeway Requirements: 9 +/-

Williams Gateway Area
Expected Population: 100,000
Expected Households: 40,000
Estimated Trips: 300,000
Regional Freeway Requirements: 1 +/-

Superstition Vistas
Expected Population: 1 million
Expected Households: 400,000
Estimated Trips: 3.2 million
Regional Freeway Requirements: 8 +/-

Hidden Valley
Expected Population: 3 million
Expected Households: 1.1 million
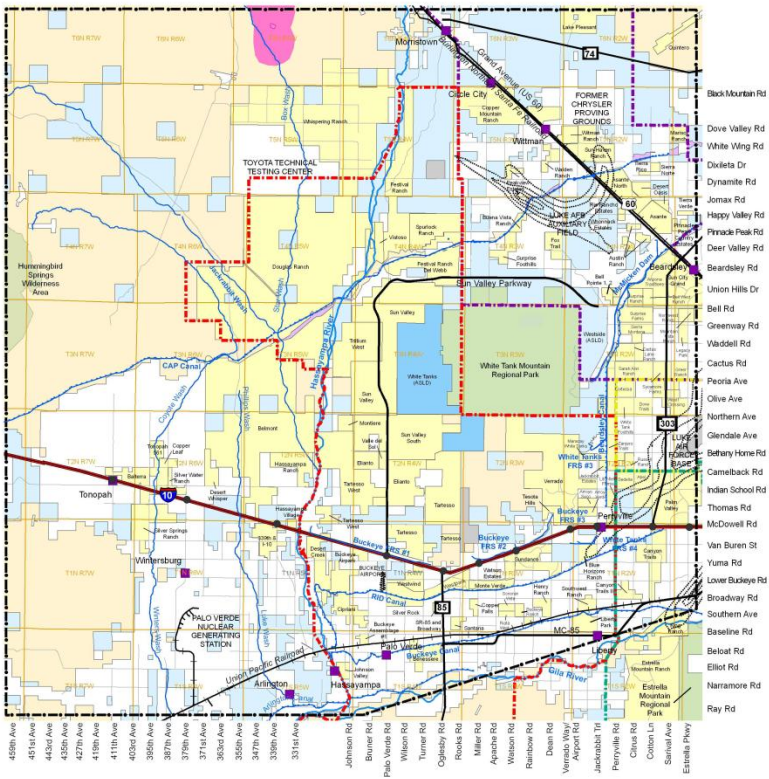Estimated Trips: 8.8 million
Regional Freeway Requirements: 9 +/-

Northern Pinal County
Expected Population: 500,000
Expected Households: 180,000
Estimated Trips: 1.5 million
Regional Freeway Requirements: 2 +/-

10 miles · 20 miles · 30 miles · 40 miles · 50 miles

NOTE: Regional Freeway Requirements:
- Utilize the results of the MAG Household Survey to estimate the number of home-based work trips, home-based other trips, and non home-based trips that might utilize the freeway network to access Metropolitan Phoenix and be captured on commuter rail.
- Assume new freeways built at 6 GP/2 HOV lanes accommodating 140,000 ADT.

Legend
- ▬▬ Potential Commuter Rail
- ▬ ▬ Future Freeway Network
- ▬ Future LRT Routes
- ▬ ▬ Future Freeway Network (Proposition 400)
- ▬ Existing Freeway Network

Distribution and composition of future growth?

	Population	Employment
2005	90,100	49,400
2030	697,200	379,500
Build-Out	2,469,100	1,095,600

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Future Fuel Prices?

Average Gasoline Price / Gallon

Legend: Nominal, Real
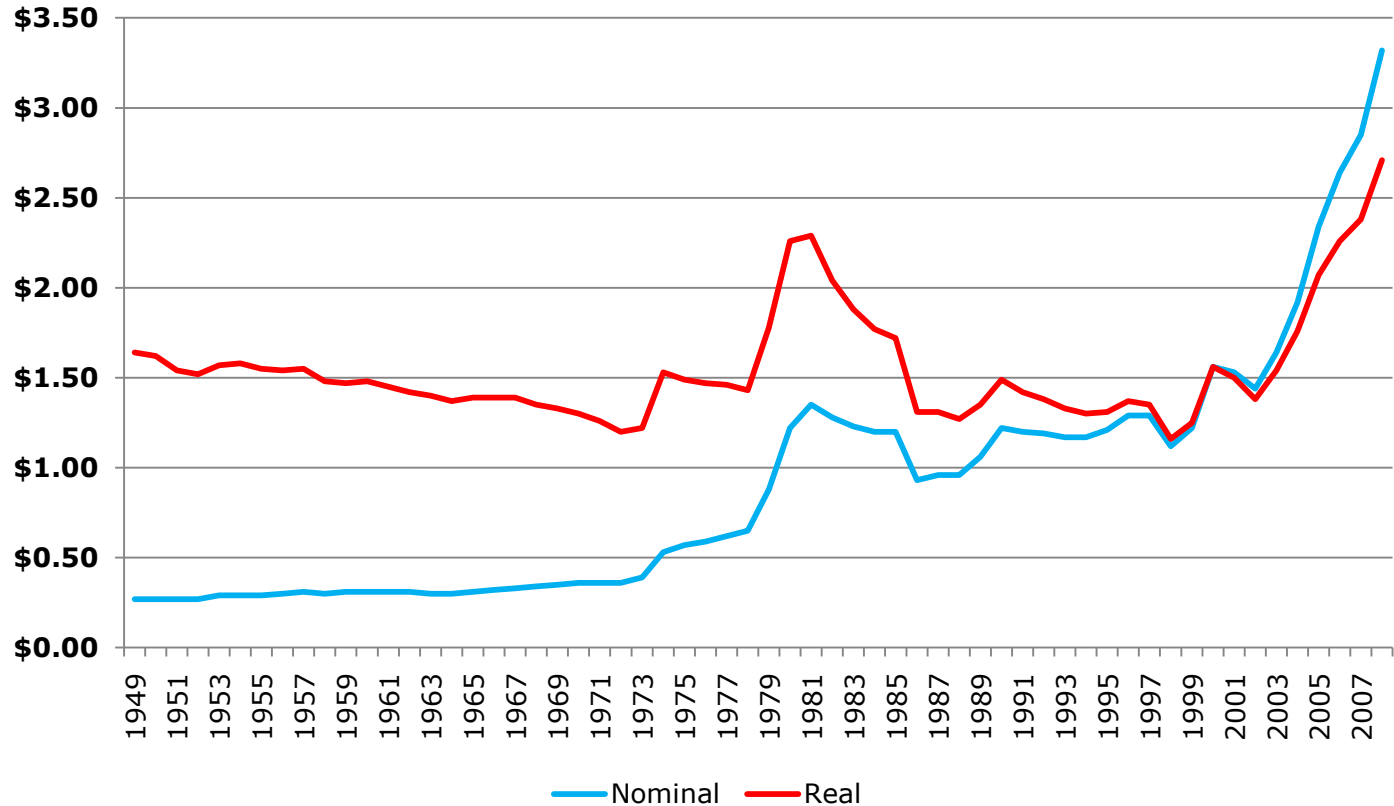
Factors Influencing Impact of Fuel Prices on Travel

Elasticity of Travel Demand with Respect to Fuel Prices

Consumer Perceptions
- Current price
- Future expectation
- Availability & Disruptions
- Alternatives

Technology
- Auto / engine / fuels
- Internet / WiFI
- Traveler Information
- New travel modes

Travel Behavior
- Reallocation of budget
- Trip chaining
- Telecommute / rideshare
- Alternative modes

Land Use
- Distribution of jobs & housing

Nature of Transportation Planning is Changing

Visioning &Frameworks
- Very long range (30+ years to build-out)
- High uncertainty
- Order of magnitude
- Technology and demographic change

Long Range Planning
- 20 to 30 year horizon
- Project Identification & prelim scope
- Some uncertainty

Operations Planning
- Real time information systems
- System reliability
- Travel behavior

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Current Policy Issues

- **Road pricing**
- **Air quality & greenhouse gases**
- **Land use policies and TOD**
- **Alternative mode strategies**
- **System operations and reliability**
- **Travel reduction / peaking strategies**
- **Evacuation / accommodation**
- **Economic development**
- **Demographic change**

The Future

- **Suite of modeling tools required for different applications**
- **Models will be looked to for more "answers" by policy makers.**
- **But models do not provide the answer – they provide insight.**
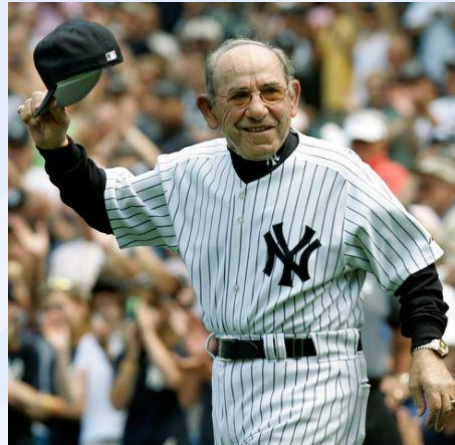- **Modeling should support the policy discussion not replace it.**

Prediction is very difficult, especially about the future.

Niels Bohr, Danish physicist

The best way to predict the future is to invent it.

Alan Kay, American Computer Scientist

The future ain't what it used to be.

Yogi Berra, New York Philosopher