



TRB Session 364

**Transportation Fuel
Consumption Forecasts &
Financial Implications for
California**

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Presentation Organization

- Energy Policy
- Transportation Policy
- Transportation Finance
- State Revenue Estimation
- The California Case
- Energy v Transportation Forecasts
- Who has it right?
- What it all means





Energy Issues

- Major Energy Issues
 - Energy Security and Imported Oil
 - How Much Is There and Where Is It
 - Economic Costs of Imported Oil
 - Monopoly Controlled Prices
 - Balance Of Trade Impacts
 - Environmental Impacts of oil Consumption
 - Exploration and Transport
 - Air Quality





Energy Policies

- Conservation
 - Choose Not To Use
- Efficiency
 - Get The Most Work From Fuel Used
- Alternative Fuels
 - Develop Cost Effective Alternatives





Transportation Issues

- Congestion
 - More Users
 - Less Investment
- Environmental Impacts
 - Air Quality
- Quality of Life
 - Smart and Dumb Growth
 - Value of Time





Transportation Policies

- Increase Capacity
 - All Modes
- Improve Technology
 - ITS
- Improve Level & Quality of Service
 - Safer, Cleaner & More Efficient Vehicles
 - Consumer Preferences V National Policy





Caltrans Transportation Energy Study 2002-2003

- Critical review of current energy policies
- Energy supply and demand
- Projection of fuel demand
- Long range systems impact on energy use
- Technological change
- Statewide growth and infrastructure land use and development
- Economic implications
- Financial, environmental and economic impacts





Purpose of Fuel Forecasting

- Transportation planning
 - Air quality analysis
 - Infrastructure investment
 - Policy assessment
- Revenue estimation from fuel taxes
 - Economic analysis
 - Security analysis
- Greenhouse gas emissions estimation





Focus of Forecasting Models

- Motor vehicle fleet stock
- Fuel economy
- Vehicle miles traveled (VMT)
- Fuel consumption
 - by vehicle type: LDVs, HDVs, transit
 - by fuel type: gasoline, diesel, compressed natural gas (CNG), jet fuel, electricity





Fuel Forecasting in California

- Caltrans Motor Vehicle Stock, Travel and Fuel Forecast (MVSTAFF)
 - Motor vehicle stock
 - Travel
 - Fuel
- California Energy Commission (CEC) Conventional & Alternative Vehicle Response Simulator (CALCARS) model





Caltrans MVSTAFF

- All on-road vehicles
 - Light Duty Vehicles (LDVs)
 - Heavy Duty Vehicles (HDV)
- Measures only conventional fuels
 - Gasoline
 - Diesel
- Provides detailed data for 58 counties





California Energy Commission

CALCARS

- Conventional & alternative vehicle response simulator
- Light Duty Vehicles (LDVs) only
- Alternative fuels and vehicles
 - Electricity
 - CNG
- Alternative scenarios for policy assessment



MVSTAFF – CALCARS

Differences

- MVSTAFF

- Gasoline and diesel only
- Alternative fuels and vehicles grouped proportional to gasoline and diesel
- Used to estimate future revenues from excise fuel taxes

- CALCARS

- Electricity and CNG included
- Alternative scenarios for policy assessment



Socioeconomic assumptions

Variable	MVSTAFF	CALCARS
Gasoline price	Gasoline: Taken from DRI-WEFA Forecast	Gasoline: \$1.64/gallon over forecast period
Economic indicators	Inflation: 3% over 20 yrs. Unemployment: None	Inflation: None. Unemployment: 5% p.a.
Population	1.68% - 1.18 % annual growth	1.4 % annual growth
Income	1.71% growth per person	1.5 % growth per household
Prime lending rate	8.5% average 2004-2011 9.8% average 2018-2025	None





Fuel Economy Assumptions

- Both assume
 - No new corporate average fuel economy (CAFE) standards
 - No increase in LDV fuel economy
- MVSTAFF
 - Includes annual improvement in MPG for HDVs, based on historical trends

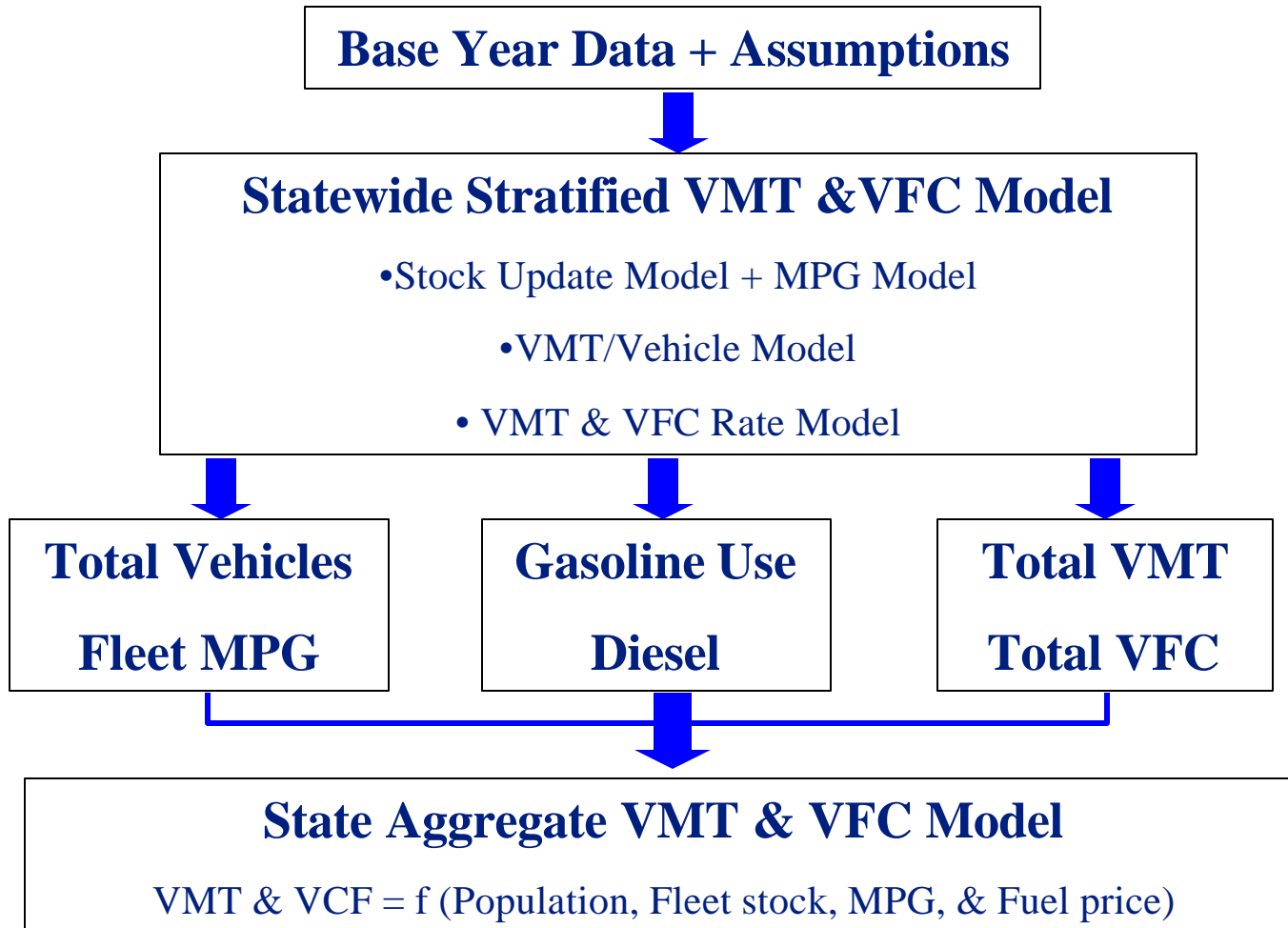


Alternative Fuels Assumptions

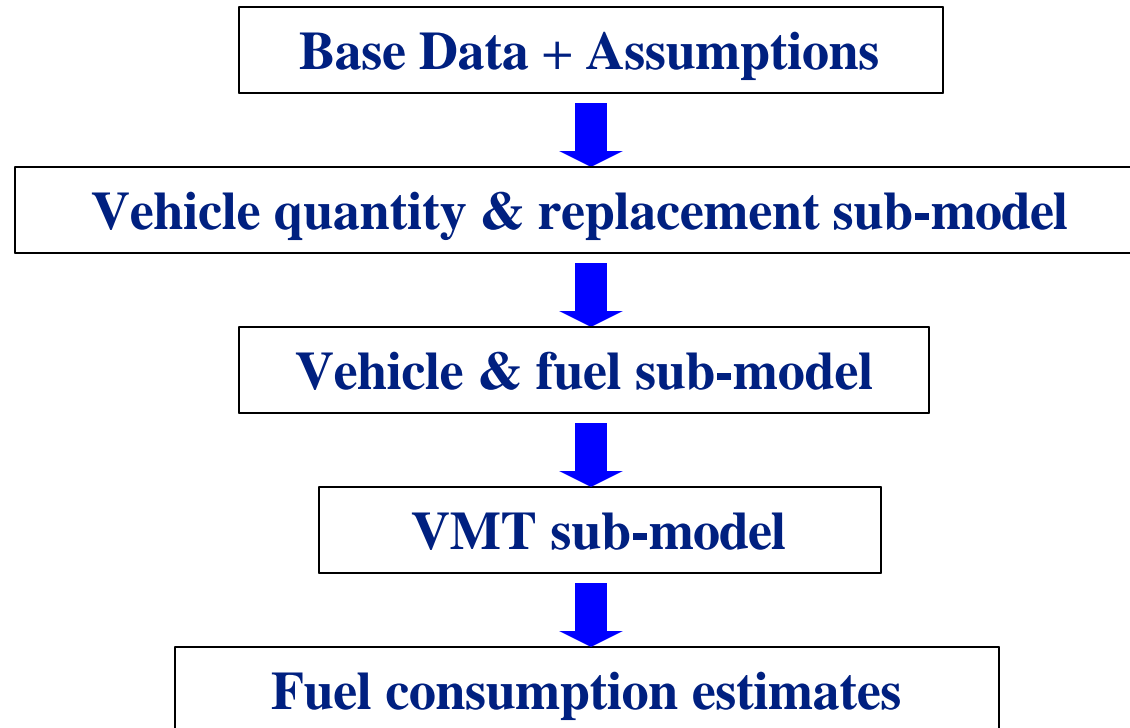
- Both assume
 - no significant market penetration of AFVs
- MVSTAFF
 - AFV stock added proportionally to diesel and gasoline totals
- CALCARS
 - Hybrid-electric sales consistent with CARB Alternative Technology Partial Zero Emission Vehicles
 - Existing purchase incentives included in vehicle choice model



MVSTAFF Process

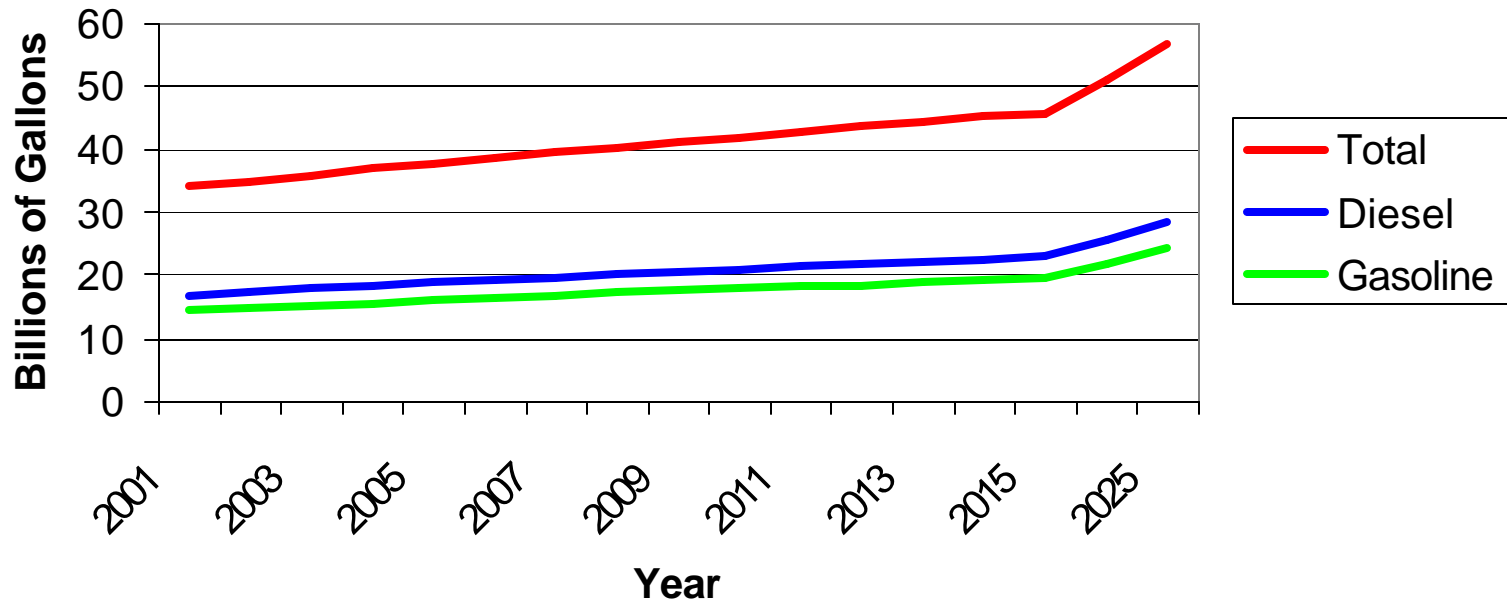


CALCARS Process



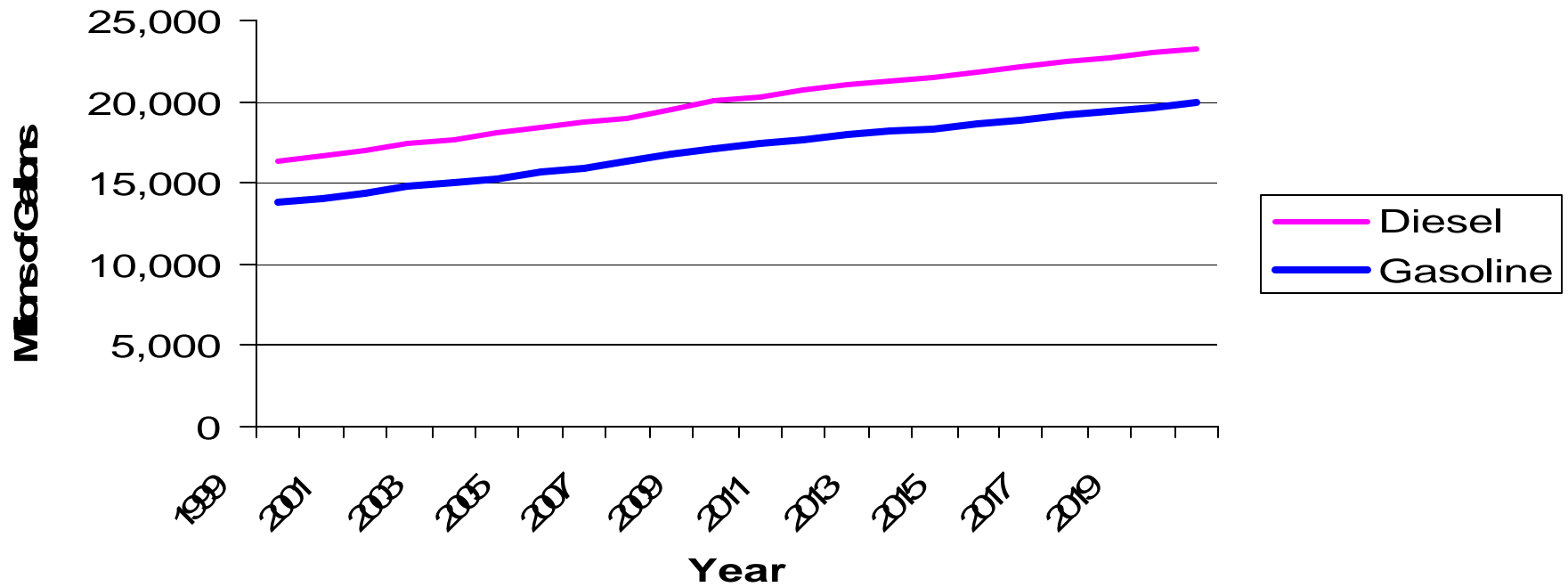
MVSTAFF Fuel Consumption Results

MVSTAFF Fuel Consumption Forecast

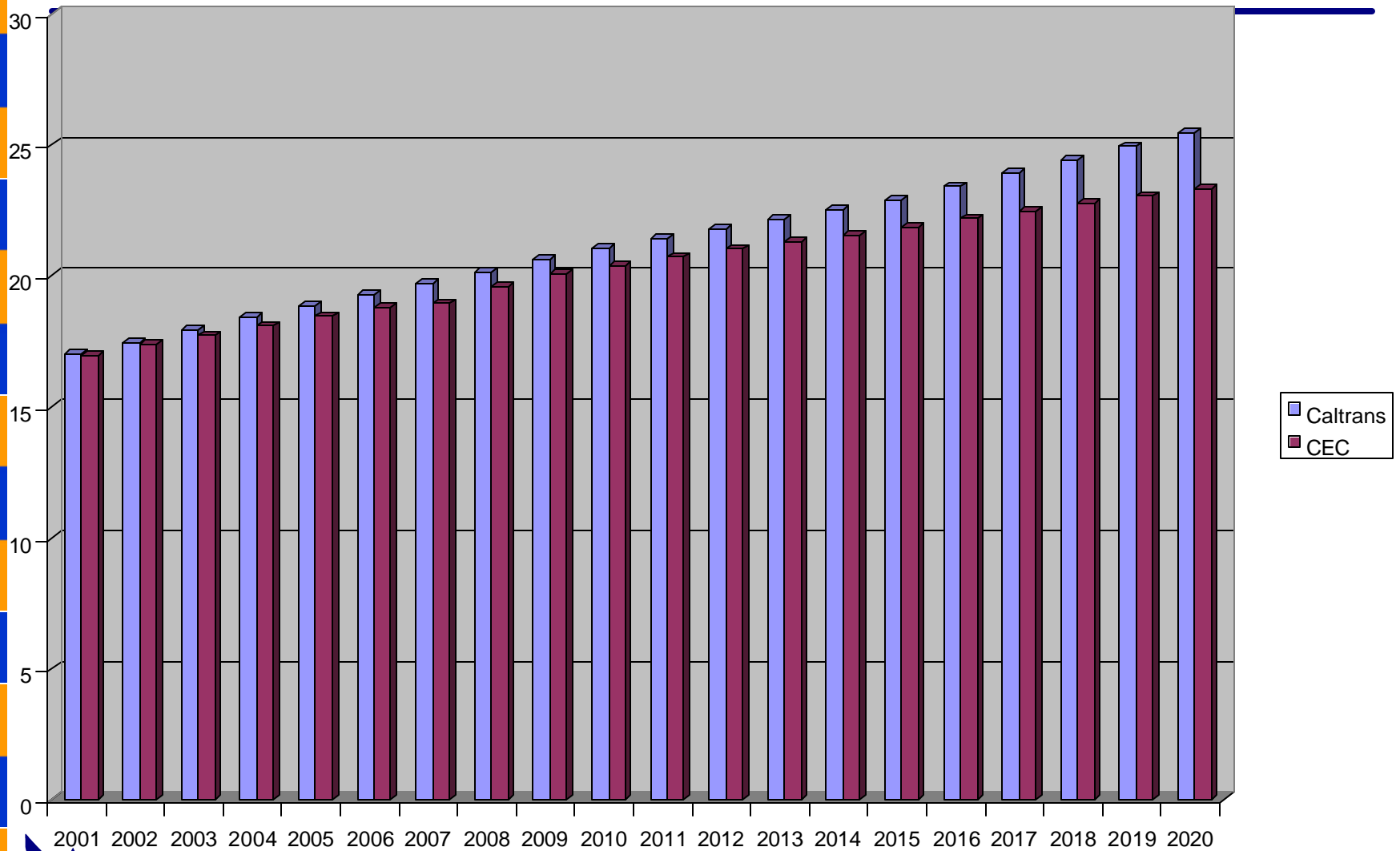


CALCARS Fuel Consumption Results

CALCARS: Projected Fuel Consumption



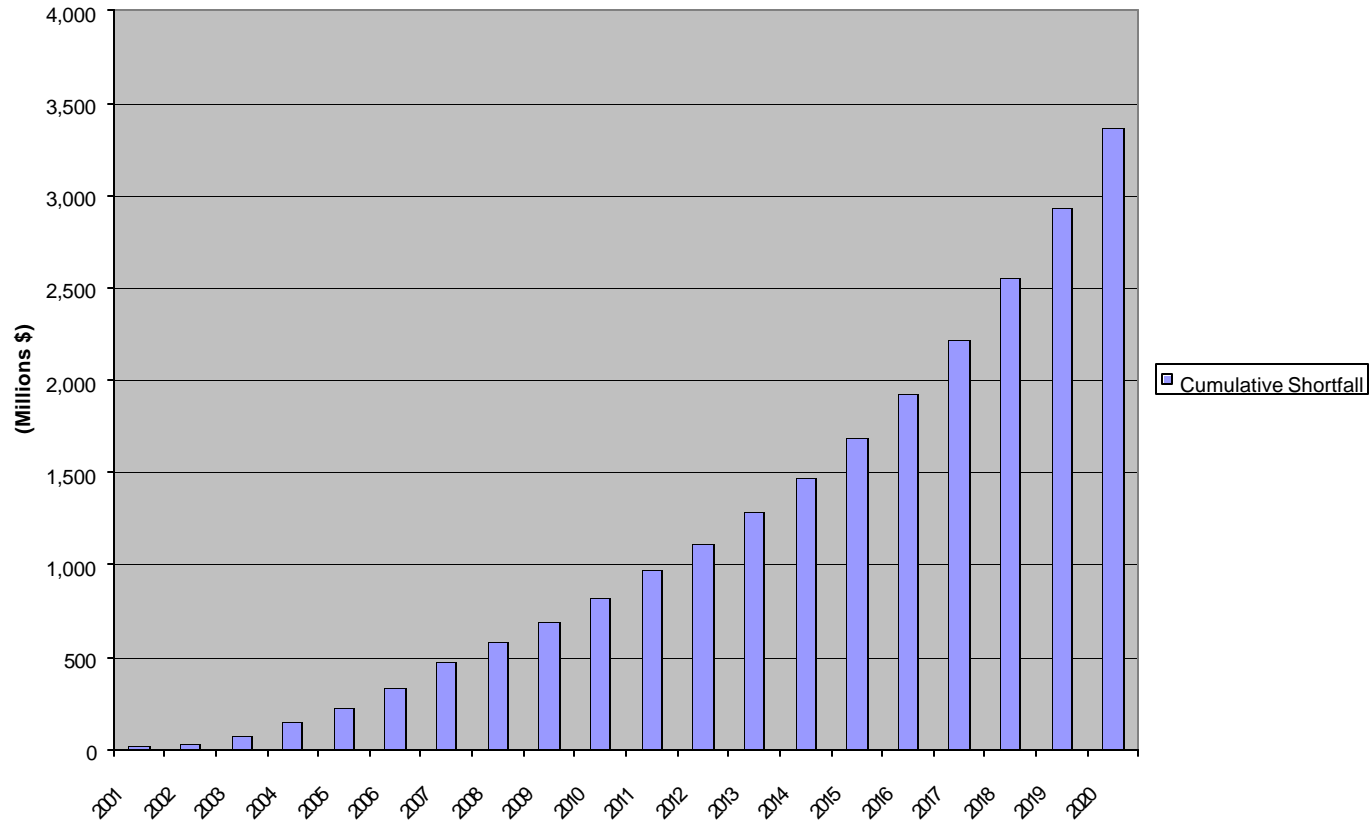
Fuel Consumption Forecasts



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Fuel Tax Implications

Cumulative Shortfall





Conclusions

- Transportation and Energy Planning Have Different Objectives
- Communication and Technology Sharing Would Improve Forecasting...for Both
- Lack of Understanding Can Lead to Miscalculation of Fuel Tax Revenue in the Long Term
- Adjustments to Tax Rates or New Methods Are Required to Maintain Revenue

