Examining Fuel Economy and Carbon Standards for Light Vehicles

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Research Round Table on The Cost and Effectiveness of Policies to Reduce Vehicle Emissions

International Transport Forum, Paris, France

January 31-February 1, 2008

Argonne National Laboratory is managed by
The University of Chicago for the U.S. Department of Energy

What are the key decisions?

- **Are carbon emission or fuel economy standards the right approach?**
- **Stringency of the emissions or fuel economy target?**
- **Timing – how soon?**
- **Structure of the regulations**
- **Complementary policies?**

Are carbon emission or fuel economy standards the right approach?

- **Already decided that EU will regulate carbon emissions, but issue is still worth examining**
- **Key factors:**
  - **How critical is the problem? SEVERE**
  - **Are potential damages incorporated in the current decision system? GENERALLY NOT, BUT THEY COULD BE**
  - **Are key decisions sensitive to costs? APPARENTLY ONLY MODERATELY SO**

Stringency of the target emissions/fuel economy?

- **Alternative approaches**
  - **Market basket of "Cost effective" technologies**
  - **"Top runner" approach**
  - **Projected top runners (for future fleet)**
  - **Comparable rate of improvement – based on historical rates or standards elsewhere**
- **Key issues**
  - **Whose definition of cost effective? If not vehicle purchasers' definition, will they buy?**
  - **Whither performance, luxury, size?**

Timing – how soon?

- What does the emissions target demand?
  - % of fleet requiring redesign
  - How extensive is the redesign?
  - Only technologies in current mass production, or requiring extensive product development?
  - Risk of consumer rejection?
- Some key timelines:
  - Time from lab success to first job – 2 to 3 years
  - Introduction to proliferation decision – 2 to 3 years
  - Integration into company fleet – 5 years +
- Must the future resemble the past? (new simulation capability, changed role of suppliers, etc.)

Structure of the regulations

- **Define Goals:**
  - **Economic efficiency**
  - **Focus primarily on technology or try to encourage mix shift?**
  - **“Fairness” to competing manufacturers**
  - **Avoid damage to individual manufacturers**
  - **Miscellaneous: encourage safety; avoid discouraging key technologies**

Uniform targets or attribute-based standards?

- **Uniform targets push mix shifts, but place different technical burdens on automakers**
- **Attribute-based standards tend to even out burdens, are more economically efficient…but offer no incentive for mix shifts**
- **Weight-based standards offer most even burden…..but no incentive for weight reduction**
- **Size-based standards incorporate incentive for weight reduction, but burden is less equal across different automakers**

Figure 2.
Automobile Fuel Consumption, gallons/100 miles, vs. curb weight, with truck trendline superimposed sales>1000

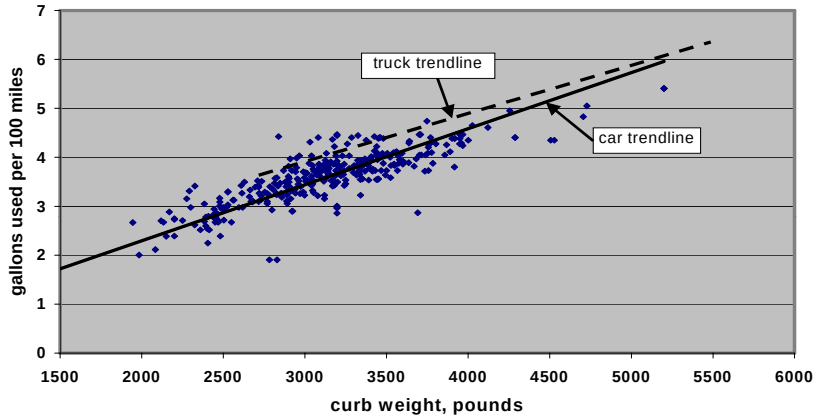
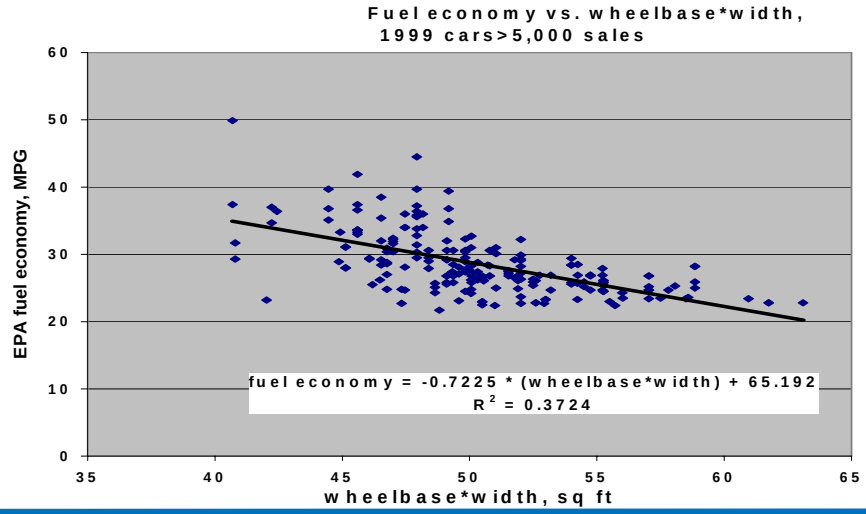


Figure 3.



What about potential fuel savings that are "outside" of the regulations?

- **Technologies that aren't accounted for in vehicle testing**
  - **Driver behavior**
  - **Accessories, and reduced accessory loads**
  - **Tire pressure**
- **Replacement tires**

Measures can be taken to move "outside" factors to the inside…..or deal with them in other ways.

Complementary policies?

- **Are these necessary?**
  - **Degree of societal buy-in**
  - **Stringency effects: first costs, loss of amenities (performance, etc.) vs. fuel savings**
  - **Do goals include protecting *all* manufacturers?**
- **For the European market:**
  - **Fuel costs are not the issue – they're already high, and raising them may have small effect**
  - **Sales and registration taxes, circulation taxes – more direct in combating consumer reluctance to pay for more efficiency**

One last point:

The costs of new regulations will be many billions of euros…..so getting the fine details right can have huge consequences….

A simple thought experiment: 15.5 million cars/yr (2006) @ 1000+ euros/car….do the math!