Cost/Benefit Analysis at NHTSA - DOT

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What is NHTSA

- National Highway Traffic Safety Administration
- Regulates motor vehicle safety and sets fuel economy standards
- Sets performance standards that require manufacturers to provide air bags, electronic stability control, etc.
Role of cost/benefit analysis

• Executive Order 12866 requires agencies to prepare cost benefit analyses to justify rulemakings.
• Regulatory Impact Analyses are reviewed by OMB and put into a docket for comment.
• Cost benefit analysis used to select the most cost effective alternative.
Planning function

- Mainly benefit side examined to determine agency priorities for planning future rulemakings.
- Combination of target population, are countermeasures available, how effective might they be, and costs
Cost/Benefit Factors

• Benefits in motor vehicle crashes include injuries at different levels from minor to severe, fatalities, and in some cases property damage reductions.

• Costs occur when vehicle is purchased, but benefits occur over the vehicle lifetime.
Equivalent lives

- Willingness to pay to avoid specific levels of injury are compared to the willingness to pay to avoid a fatality and injuries are turned into equivalent lives.
- This allows us to compare alternatives on a “cost per equivalent life saved” basis.
Value of a Statistical Life

- Set by DOT policy at $6.2 million in $2011.
- NHTSA adds to VSL, the economic costs associated with crashes of about $300,000 per fatality and calls that comprehensive costs.
- Economic costs include EMS, legal, insurance, property damage, travel delay.
What goes into an Analysis?

• Fatality, injury and crash data are used to determine the target population.
• Effectiveness is estimated by statistical analysis of crash data if available or by combining data from research testing; biomechanics; driver reaction; and survey data.
• Costs are determined by tear-down studies, sales estimates and testing to determine current compliance with the proposal, fuel economy effects also estimated.
• Conducts small business/ regulatory flexibility analyses.
• All this information is combined using engineering principles, statistics, and economic theory into a logical flowing analysis.
Analysis Challenges

- CAFE analyses
- Determine the effectiveness of new crash avoidance technologies (e.g. V-2-V communication)
- Gathering small business information when these companies constantly merge/are bought, etc.
CAFE Analyses

• Currently working on setting fuel economy levels for MY 2017-2025 passenger cars and light trucks
• Previously set standards based on maximum net benefit to society. Huge model pulled together costs and benefits of 40+ technologies.
Fuel Economy vs. Safety

- Examining effects of smaller vehicles on safety
- Examining effects of making vehicles lighter, but keeping same size through material substitution.
Fuel Economy vs. Safety

- Cross-sectional analyses of the societal fatality rate per billion vehicle miles of travel (VMT) by mass and footprint
- Mass reduction in smaller cars increases fatality rate, mass reduction in larger light trucks reduces fatality rate.
Vehicle-to-Vehicle Communication

- Challenge is to estimate benefits for vehicle to vehicle communication.
- Short range radio communication and software to analyze data to determine when to warn driver of potential crash, to brake the vehicle, etc.
V-2-V Communication

- Need to know what types of crashes will a warning be given
- Driver reaction to warning
- Timing of the scenario to determine whether crash will still happen at lower speed, or crash avoided.
V-2-V Communication

- No systems on the road to provide real data.
- Fleet operational test starting soon in Ann Arbor. But will have few crashes.
- Need to determine what test data are useful for analysis – balloon car on the test track.
Driver reaction to V-2-V

- Simulator data will be used to help determine what type of warning to provide drivers and how they react to those warnings.
- Need to determine driver acceptance of vehicle taking over control and braking.
Questions?

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