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Introduction

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The OTA study Technology ***and Handicapped People*** concentrated on an examination of technologies developed for and used by people with handicaps. An alternative, or complementary focus, would be on technologies designed to prevent handicaps. There are literally hundreds of prevention technologies that constitute familiar aspects of 20th century American life. Many prevention technologies have derived from scientific research; the vaccines that prevent crippling childhood diseases are among these. Others represent a more prosaic application of common sense to everyday problems; an obvious example is the ubiquitous rubber bathtub mat. Some prevention technologies require the installation of elaborate safety equipment, such as that found in a nuclear power plant, others require only the installation of a simple idea in people's minds—e.g., the advice not to drink and drive.

Regardless of their diverse technical characteristics, all prevention technologies can be viewed in a common perspective vis-a-vis the class of technologies designed to treat, restore, rehabilitate, and palliate handicapped individuals. Prevention technologies complement these "after-the-fact" technologies in the battle to ameliorate the consequences of handicaps. But prevention technologies also compete with treatment technologies, for a primary goal of the former is to obviate the need for the latter. Thus, physicians can exhort their patients not to smoke, or years later they can attempt to assist them to learn to live with emphysema.

Obviously, from a humane perspective, society wants to prevent all preventable handicaps. But here, as in so many other desirable human endeavors, practical considerations enter—in particular, what will prevention cost? In the coldest of analytical perspectives, the purely economic costs of preventing handicaps can be compared with the purely economic costs of dealing with preventable handicaps after they are realized. But the challenge of social resource allocation decisionmaking calls for a more complex and somewhat "warmer" cost-benefit calculus, one which blends the economic and humanitarian concerns. In the effort to minimize the adverse consequences of handicaps, analysts must develop measures (or at least concepts) of social cost which incorporate both pecuniary and nonpecuniary costs, which add the costs of suffering to the costs of materials.

The purpose of this background paper is not to develop such a social cost-benefit calculus, nor even to array the attributes of alternative prevention and treatment technologies in a comparative framework. Rather, the paper is intended merely to complement the main body of the OTA study by introducing the prevention perspective through a case study of a single prevention technology. It is hoped that this will enrich policymakers' deliberations, implicit or explicit, on the social costs and benefits of alternative strategies for dealing with the problems of handicaps.

This case study examines issues in the debate on whether passive restraint systems—air bags and automatic belts—should be required in all new automobiles sold in the United States. In 1977, Federal Motor Vehicle Safety Standard (FMVSS) 208, as amended, decreed that all new cars would have to have a passive restraint system capable of meeting a 30-mph crash performance requirement by September 1, 1983 (1984 model year), with phase-in beginning with the largest 1982 model cars by September 1, 1981.

On April 9, 1981, the National Highway Traffic Safety Administration (NHTSA) announced a delay of 1 year in implementation of FMVSS 208, and new hearings were held in August 1981 to consider whether the (delayed) rule should be put into effect or one of three alternatives should be adopted. Two of the alternatives involved a reordering of implementation dates for the various sizes of cars; the third involved elimination of the passive restraint requirement.

***NOTE: The writing of this background paper on passive restraints in automobiles was completed in May 1982. As the paper went to press in September 1982, the situation regarding passive restraints had been further altered by court decisions but had not yet been finally resolved.**

On October 29, 1981, NHTSA announced that it was rescinding the requirement altogether. Lawsuits to reverse the decision have been filed, and congressional action with a similar intent has been threatened. Thus, though the passive restraint requirement has been eliminated by administrative fiat, the issue is not entirely dead.

Congressional hearings have been held only once since the 1977 decision, but several agency hearings have been held, and debate has raged over issues as diverse as effectiveness, safety, cost, and individual liberty. The automobile, the quintessential symbol of American affluence and individualism, has thus become a battleground for a major political issue of the early 1980's—governmental regulation.

The preceding paragraph should suggest the multidimensional significance of the outcome of the Federal rulemaking, but the raison d'etre of passive restraint systems links the debate integrally into a consideration of technology and handicapped people: motor vehicle accidents annually kill more than 50,000 Americans (over half of them frontseat occupants of vehicles) and inflict disabling injuries (ranging from temporary and minor to permanent and serious) on an additional 2 million people. Automobile accidents are the leading cause of death and accident-produced handicaps among young people. Some analysts have estimated that passive restraint systems could prevent up to half of the deaths of frontseat occupants and over 100,000 moderate to critical injuries each year.

The remaining chapters of this paper explore the issues and evidence in the passive restraint system debate. Chapter 2 considers the nature and extent of the automobile safety problem, examining accident, death, and injury data and reviewing the record of automobile safety standards and devices, including the current ("active") seatbelt system. Chapter 3 offers a glimpse at approaches to improving the use of passenger restraints by means other than mandating passive restraints. Attention then turns in chapter 4 to a description of the two passive restraint systems—air bags and automatic belts—and a presentation of data on their estimated costs, safety, and effectiveness in reducing deaths and disabilities. The fifth chapter reviews and compares cost-benefit analyses of these systems. Chapter 6 identifies and discusses the philosophical and ethical issues related to mandating passive restraint systems. Concluding thoughts are presented in chapter 7.

In closing this introduction, it seems worthwhile to reflect momentarily on a peripheral but important theme—20th century technology and its impact on health (a theme which is well illustrated by the case of the automobile). Certainly, overall, technological developments in this century have enhanced the quality of life and added years to its average duration. Many developments have directly attacked common sources of disability and mortality (polio vaccine is one prominent illustration), while other developments have reduced health hazards indirectly (for example, the affluence bred of modern industrialization has improved our diets and thereby rendered us more resistant to disease). But 20th century technology has not invariably reduced health hazards. Rather, the history of new technology is one of continual redefinition of the types and sources of risks to health, with new hazards replacing old, and the gains generally exceeding the losses: the overall trend in disability and mortality has been downward.

The automobile serves as a prime example of the complexity of modern technology's role in health. Its invention introduced an era in which the time distance between a health crisis and curative medical care would be reduced by critical minutes, in which timely rescue from a burning building would become increasingly feasible, and in which distribution of life-sustaining food and medicine would occur ever more rapidly and inexpensively. Accompanying these health benefits of motor vehicles, however, have been the significant health costs of street and highway travel, and the deaths and injuries which reflect the size, structure, and velocity of the vehicles, as well as characteristics of the roads and of the operators of the vehicles. The disproportionate impact of motor vehicle accidents on the young is particularly tragic, as thousands of lives are cut short in their prime and healthy bodies are committed to decades in beds and wheelchairs. The economic costs of treatment and rehabilitation as well as lost future productivity are substantial. The emotional toll is enormous. It is toward reducing these burdens that the technology of passive restraints is directed.