

## **AUTOMOTIVE AIDS FOR THE HANDICAPPED**

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In attempting to define the "state of the art" of automotive aids for the handicapped, let us first consider the type of equipment available to consumers. Although a small amount of custom-designed automotive control systems serves some handicapped drivers, almost all drivers who do not have the use of their lower limbs depend on hand controlled brake-accelerator systems manufactured by approximately 18 companies in the United States. These add-on hand-control systems represent a wide variety of mechanical linkage mechanisms, conceptually dating back to after World War II when the availability of an automatic transmission eliminated the clutch pedal. Some manufacturers provide additional adaptive equipment—a variety of electrical or mechanical dimmer switches, parking brake extension, turn levers, shift levers, and an assortment of steering assists—to give the handicapped driver the particular assistance needed in operating the controls of an automobile.

Essentially the "state of the art" of adaptive automotive aids described so far has not changed very much over the last 25 years, whereas automobiles have changed a great deal to comply with stronger demands for safety. We note the now existing Federal regulations on the use of seat belts, the requirement of a collapsible steering column, etc., which have resulted in a general incompatibility between newer automotive designs and older add-on control systems for handicapped drivers. The installation of many commercially available hand-control systems to the variety of modern interiors of passenger automobiles has therefore become a very critical problem that, in the interest of public safety, must be fully realized and eliminated. At best, many of these old automotive hand-control systems are a conglomerate of bulky metal components, further cluttering the already tight space under and in front of the dash, and generally contributing only additional hazards in case of inertial changes of the vehicle.

We note with some feeling of encouragement that a glimmer of hope has appeared with the introduction of a specially designed servo-system for handicapped drivers. A production model of a vehicle featuring this servo-system, built by the VOLVO Co. of Sweden, has recently been

introduced in the United States. In addition, several independent sources in the United States are currently working on advanced motor vehicle control systems for disabled drivers.

The "state of the art" of automotive aids for drivers who for one reason or another have chosen to operate van-type vehicles is very similar to the situation characteristic of commercially available add-on equipment. A variety of wheelchair access systems, wheelchair tie-down systems, and seating arrangements are advertised as specially equipped vans for the handicapped. Except for a few custom designs, these special vans are a more recently developed consumer item, and little is known as to the systems' reliability and performance. Considerable effort for further development of these vehicles is necessary, especially in areas of wheelchair transfer, tie-down systems, and seating arrangements for both handicapped drivers and passengers. The entire spectrum of automotive seating for the handicapped is a critical problem, requiring considerable work to provide adequate solutions. We strongly feel that current Federal Motor Vehicle Safety Standards should be implemented wherever possible to afford handicapped drivers and passengers at least the same protection given to the nonhandicapped motoring public.

We are confident that we are approaching an era where knowledge of the needs of the handicapped driver and passenger is no longer confined to a few groups, but that these needs are widely realized by many, including the automotive industry that must eventually play a major role in making available optional automotive systems for the disabled.