Converting a Compact Station Wagon to a Mobile Health Unit

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DESPITE the continuous advances in communicable disease control, significant clusters of persons in most communities either are not being provided with adequate health protection or are not availing themselves of these services. Repeated studies of communities by the Demonstration Program of the National Communicable Disease Center, Public Health Service, have substantiated the general belief that such clusters usually occur in the low socioeconomic areas.

It is generally accepted also that persons in these clusters are more difficult to motivate toward appropriate health behavior than other members of the community. To cope with this problem, public health agencies are continually searching for tools which will prompt these persons to use health services.

The search for practical public health tools for hard-to-reach low socioeconomic groups frequently has been frustrating. However, the mobile clinic concept repeatedly appears as a rational solution to providing convenient and acceptable service to a community's previously unresponsive members. Mobile clinics have been proved effective, especially in immunization programs. For example, in the Atlanta, Ga., poliomyelitis vaccination campaign of 1962 a much better response was observed in all age groups within the low socioeconomic stratum when a mobile van was used than when other methods were employed (I. L. Sherman: Unpublished report of the Statistics Section, Epidemiology Program to the director, National Communicable Disease Center, Public Health Service). Nevertheless, the term "mobile clinic" often implies prohibitive costs and numerous technical difficulties to health administrators.

The history of mobile clinics in the United States has not been bright. Programs using mobile clinics have been fraught with problems, often technical and economic. Vehicles for these programs have been expensive to purchase, operate, and maintain; they universally have been cumbersome. Often the vehicles have been single-purpose units with only a limited application, a luxury that many health departments could not afford. It is understandable that many public health people have been disillusioned about the mobile clinic approach.

However, the objections seem to be based

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Figure 1. Compact station wagon with expanding top lowered and automatic step retracted

Figure 2. Top extended for 6-foot headroom. Top windows are screened

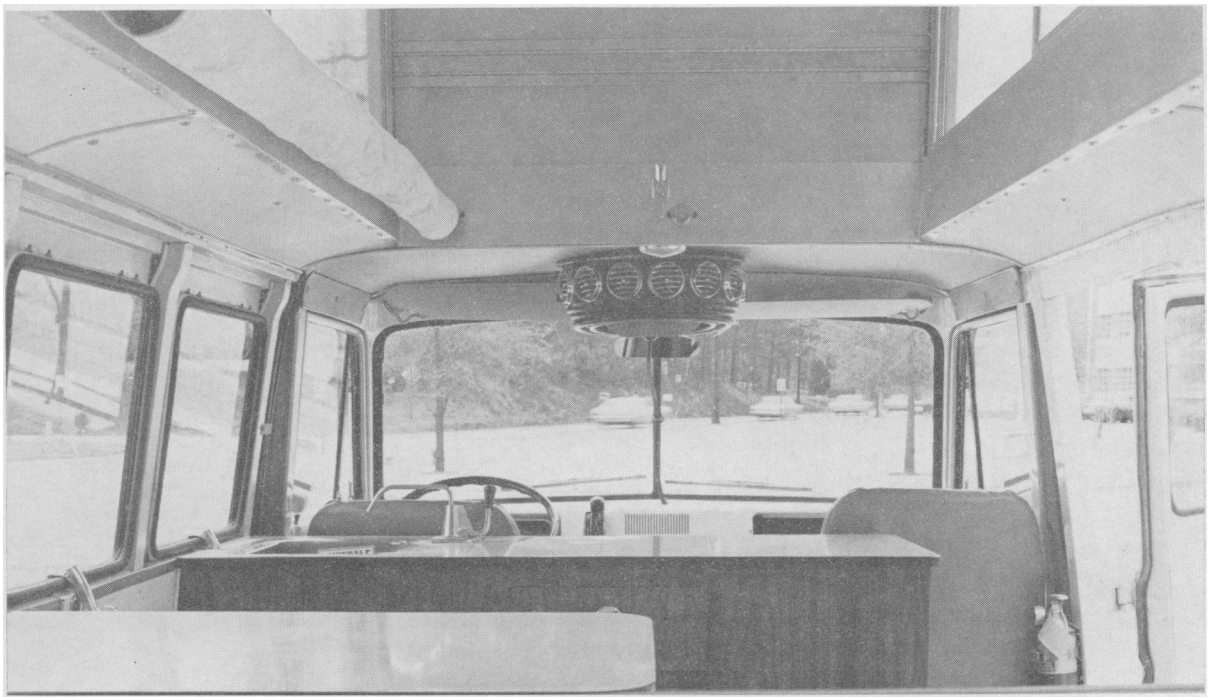

Figure 3. Small desk table and work counter with sink

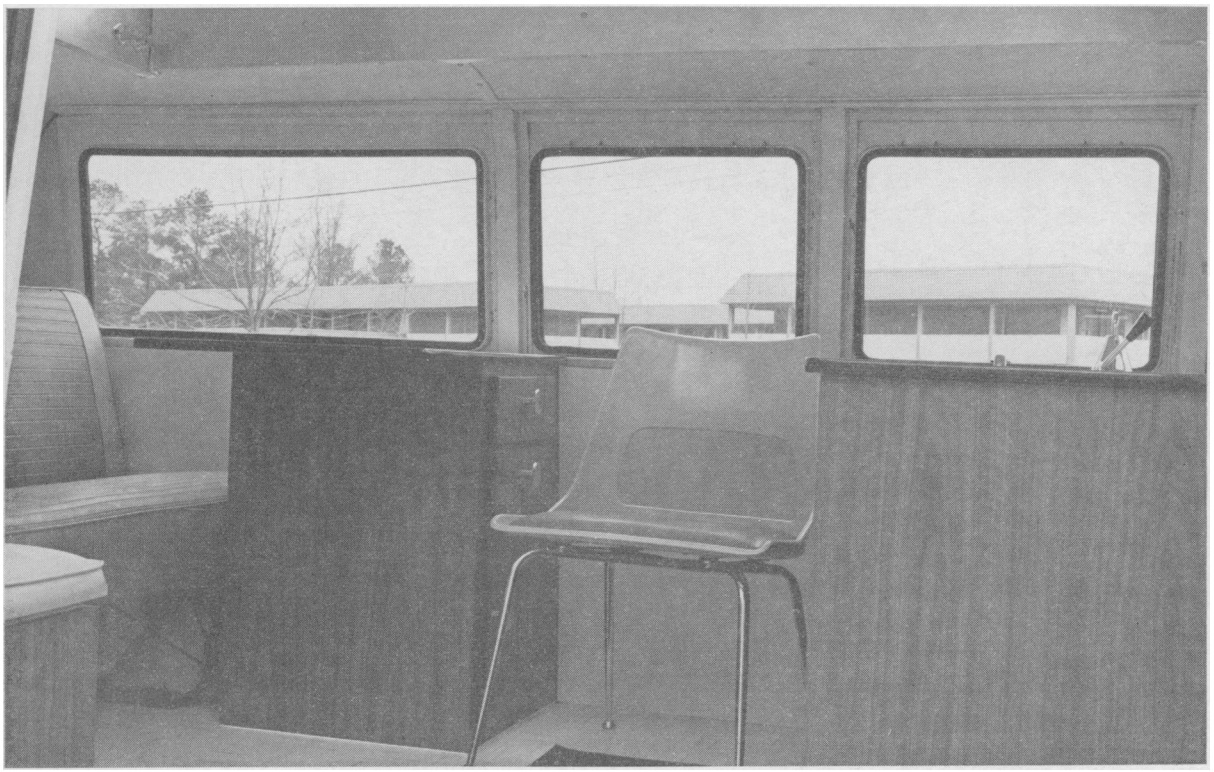

Figure 4. View from side door showing work counter and desk table. Storage seat over rear wheel is partly visible at left

largely on engineering and not on philosophy. Within recent years several available commercial vehicles have been particularly suitable for conversion to mobile clinics. These vehicles are compact, highly mobile, economical, and easily operated by a nurse. Such vehicles can be multifunctional, with uses such as immunization, tuberculin testing, blood testing for syphilis, health education, chronic disease screening, and even family planning (*1–3*).

The converted vehicles, perhaps better designated as "curbside health units" to distinguish them from the bulkier mobile clinics, are operated on a block-by-block or door-to-door basis. Their presence can be announced by a household visit or by the use of sound equipment on the van.

The National Communicable Disease Center has now developed and field tested several of these compact mobile clinics. The largest curbside clinic is the size of a common milk delivery truck and is equipped with its own 110-volt powerplant, air conditioning, electric heat, running hot and cold water, electric refrigeration, and public address system. A portable X-ray unit recently has been added.

This paper will describe a smaller unit which, because it contains less space and fewer conveniences, is within the budget of more health departments.

The Basic Vehicle

A compact station wagon that has a wheelbase of approximately 90 inches can be supplied by the Chrysler, Ford, General Motors, and Volkswagen companies (fig. 1). If the vehicle is to be equipped with an air conditioner, a V-8 engine is essential to provide the additional power needed. Also, an automatic transmission facilitates driving in city traffic.

This vehicle, with optional seating for eight passengers, has the added advantage of being useful for transporting personnel and for bulk hauling when the two rear seats are removed. Therefore, health departments which cannot afford or do not need a full-time mobile clinic can use the same vehicle for other purposes.

The addition of an expanding top of aluminum and glass by the factory or a local customizer permits rapid conversion to an interior with full headroom (fig. 2). This insulated top can tolerate speeds up to 25 miles per hour without being lowered. The extension or retraction of the top is simple and requires only a few seconds.

These vehicles may require air conditioning or additional heating, depending on the climates in which they are used. Sufficient cooling usually can be achieved by using two large 12-volt ventilating or defrosting fans. An auxiliary heater can be added and operated off the engine cooling system.

When air conditioning is added, it usually is operated for long periods while the vehicle is parked, so that heavy-duty engine-cooling options, such as a 7-blade fan, extra capacity radiator, and a fan shroud, are important. Also a hand throttle must be provided to permit idling speeds of approximately 1,800 r.p.m. High-output alternators and batteries are desirable. Tinted glass reduces the glare and need for air conditioning. The optional 14-inch wheels with 6-ply tires are a good investment for economy and safety.

Modifications for Clinic Use

The ceiling may be insulated with batts of fiberglass held in place by ¼-inch plywood, flexed to fit the contour of the ceiling if such insulation is not available from the manufacturer. The plywood may in turn be painted or covered with washable plastic material and affixed by sheet metal screws driven into the ribs of the roof. The side panels can be similarly insulated and covered if desired. This reduces moisture and temperature control problems inside the vehicle and improves its appearance.

The vehicle can be used as a clinic by replacing the middle seat with a card table and one or two folding chairs. However, the efficiency of the mobile clinic is improved by adding simple cabinets. The cabinets can be customized by any company that outfits station wagons as campers. Such cabinets should be lightweight and designed to unfasten easily from the floor and removed.

To add the cabinets the floor should be covered with ¾-inch plywood, extending from the front seat and motor compartment to the rear doors. The plywood can be covered with a material such as flexible tile or carpeting.

The rear seat is moved farther back to the position immediately in front of the rear doors. More room could be obtained by building a narrower rear bench. The middle seat is removed.

Cabinets in the vehicle consist of two main units. One unit is placed over the rear portion of the engine compartment, directly behind the front seats (fig. 3). A slip-out panel over the engine compartment permits the hood to be raised for servicing the engine. This cabinet may contain a small sink equipped with a marine type pump-faucet A 12-gallon water tank, refillable from the outside, can be concealed in the base of the cabinet. Refrigeration is supplied by portable ice chests. The rear cabinet unit is placed over the left rear wheel well, providing a working desk adjacent to the rear seat (fig. 4).

Both cabinets can be constructed of plywood and covered with 1/16-inch washable simulated wood laminated plastic. Their top surfaces may also be covered with laminated plastic. Drawers and doors of cabinets should be equipped with catches to prevent opening while the vehicle is moving.

The front cabinet unit may be used as the nurse's working area and for supplies such as vaccines and syringes. If the nurse sits on a typist's or swivel chair between the two cabinets against the left wall, she will be facing the side rear door through which the patients enter.

Another worker may sit on the left side of the rear seat; the rear cabinet provides a desk top for this worker. The right rear fender is covered with a small cabinet about the height of a foot stool and padded on the top to serve as an auxiliary seat. A door permits the use of this cabinet for storage. A portable oxygen tank can be stored in one cabinet. A fire extinguisher and a canister type first aid kit complete the interior furnishings.

Outdoor speakers clamped on a luggage bar can be readily mounted on the roof and connected to a battery-operated public address system by extension cables into the driver's compartment.

While disposable syringes and needles are well adapted to a field operation, we found that the use of a professional model windup jet injector had a promotional appeal which both aroused the curiosity and allayed the fears of the patrons. Ordinarily, the number of persons served in this unit would not justify the use of a jet injector, but we felt this motivational effect was worth the additional effort and expense.

While many modifications and options could be exercised in the development of such a vehicle, the estimated retail cost in Atlanta of a new vehicle complete with cabinetry, air conditioning and extra interior air-conditioning condenser, and the expanding top is approximately $5,000.

Public Health Operations

The vehicle described and an earlier model have been used extensively in Tampa, Fla., by the staff of the Hillsborough County Health Department. The curbside clinics have been taken to low socioeconomic areas where deficient immunization levels were defined by the community evaluation methods used in the National Communicable Disease Center's demonstrations. The mobile units have operated in conjunction with teams of community health workers who are nonprofessional employees of the health department. These women contact an adult in each house of the neighborhood and motivate them to seek immunizations for their children. Referrals are made directly to a nearby curbside unit, where the inoculations are administered by a nurse.

The effectiveness of teams of three or four community workers accompanying the mobile clinic was increased by equipping them with a walkie-talkie radio to provide instant communication with the curbside unit. Not only was personal protection thus afforded to the community worker, but it was possible to regulate the patient load by speeding up or slowing down the number of referrals. At the same time, the nurse was able to answer immediately any technical questions that the community worker encountered. The communication system can easily be extended to permit radio contact between the mobile clinic and the medical staff at headquarters.

In 11 months during 1965, a total of 7,600 children received 14,796 immunizations in the Tampa mobile clinic. Approximately 31 percent of these children received their initial immunization at the vehicle. Although more complete statistical evaluation of the effectiveness

of mobile clinics is needed, we believe that many preschool children who otherwise would not have been immunized were reached by the curbside clinic at a cost far less than usual for immunizations of this group.

Summary

Compact vans and station wagons can be modified for use as small mobile clinics which offer curbside accessibility of preventive services. Use of these station wagons as basic multipurpose units with optional amounts of clinic furnishings provides low initial cost, economy of operation, convenience for the staff, and public acceptance. These modified vehicles present a particularly appropriate response to rural and urban core public health priorities, affording an effective practical solution to inadequate facilities.

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Studies of Marihuana and Teenage Drug Users

How does drug use in suburbia differ from drug use in hippie communities? What prompts a teenager to use drugs? Are youngsters who use drugs basically different from teenagers who abstain? How do friends influence the decision to use drugs? Are parents involved in the decision?

The answers to these and other questions about teenage drug use are being sought in five separate studies recently launched at the Associated YM-YWHAS of Greater New York, the University of Vermont, Mount Zion Hospital and Medical Center, University of California, and the Langley Porter Neuropsychiatric Institute in San Francisco.

Teenagers and young adults in three areas of the country—California, including the southern portion of the State and Haight-Ashbury; the campus of the University of Vermont; and New York City and its suburbs—will be studied. Three of the studies will attempt to identify differences between drug users and nonusers; the New York study will compare drug use in suburbia with drug abuse in the East Village hippie community; and the Langley Porter Neuropsychiatric Institute will examine the effects of marihuana on thinking and perception and will also conduct research to learn more about naturally occurring psychosis.

Although the effects of marihuana on a person's outward behavior are well known, there has been little systematic study of how it alters the ability to think, concentrate, and perceive things. Also, no specific studies have been made of how personality factors, expectations, and past experience with marihuana influence a person's reactions to the drug.

Specific factors being studied include the social and psychological characteristics of the users and of the areas in which they live, sources of drugs, and how drugs have changed users' attitudes, values, and behavior.

The National Institute of Mental Health is supporting each of the studies. Information gathered from this research will enable the Institute and other concerned agencies to assess more accurately the extent and characteristics of drug abuse among adolescents, plan better prevention programs, clarify the way marihuana and other drugs work in the body to produce their effects, and also enable researchers to pinpoint similarities or differences between marihuana and other drugs such as alcohol.

Grants totaling $239,310 for the five grantee institutions will support the projects for the first year.