

*** OPTOMETRY ON WHEELS ***

The Sattelite Alternative

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Senior Project by

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INTRODUCTION

The idea of a 'traveling doctor' is not new. America's pioneer settlements were serviced by doctors and dentists who traveled from town to town, more out of necessity rather than by choice. This concept of mobility has more recently been replaced by another form of diversification, the satellite clinic. Optometrists, in particular, seem to be especially motivated to expand their territories by operating part-time satellite offices in neighboring communities.

To the average skeptic, the thought of a Mobile Optometry Clinic conjures the image of a spectacle vending 'shlock outfit' selling eyeglasses from the backseat of a station wagon. Actually, the mobile clinic, in this case, consists of a remodeled travel trailer, fully equipped to perform most of the functions of a typical optometric office. It is the intent of this paper to realistically evaluate the feasibility of a mobile clinic as an alternative way to deliver primary care.

MODE OF PRACTICE

Other attempts to utilize mobile clinics in the health care field have included medicine, dentistry, optometry and public health nursing. Most of these programs are government subsidized, aimed at servicing distinct populations, such as the mobile clinics being used by the Indian Health Services. Some mobile clinics are sponsored by large corporations, institutions or special interest groups, such as the Lions Club 'Sight-Mobile' program. However, very few attempts have ever been made to operate such clinics in the private sector.

A mobile clinic has many uses, ranging from mass institutional screenings, to primary care for homebound individuals. The possibilities are plentiful. For instance, contracts could be arranged to provide services for large institutions, such as schools, nursing homes, civic groups, factories or prisons. On the other hand, the clinic could be operated on a fee-for-service basis, to examine isolated, homebound individuals, or on a larger scale, entire communities.

The types of services offered can vary from simple screenings, to complete eye examinations. Generally, most of the services available in an optometric office can be included in the mobile unit.

If the unit is to be used primarily for screenings, consider a small trailer, with a floorplan that allows for smooth patient flow. By using a trailer with two doors, patients enter through the front, pass through several screening stations, and exit through the back, minimizing congestion.

If the plans call for more specialized testing, as in a general practice, the trailer must be larger, with appropriate space designated for each piece of equipment. A refracting lane can be installed, complete with chair and a wall mounted bracket for a phoropter and other instruments. Because of limited space, a mirror projector chart is advisable.

For contact lens fittings, a slit lamp and keratometer are necessary. The slit lamp should be set up in the exam room, where the doctor will be working most of the time. The keratometer may be placed out in the screening area for oper-

Specialties such as low vision and orthoptics require equipment which can be stored away, and pulled out as needed. The luxury of a Non Contact Tonometer would be nice, but if money or available space is limited, substitute a more affordable applanation device. A dispensary, with a modest frame selection and workbench can also be squeezed in easily.

DEMOGRAPHIC INFORMATION

Although it appears that most general optometric services can be provided in a trailer, the establishment of a successful mobile practice depends on many other factors. A very important consideration is matching the right area with the types of services to be offered.

A mobile clinic which is designed strictly for visual screenings can be successful in any type of area. In large metropolitan areas, there are many institutions that would benefit from mass screenings, all within a very reasonable driving distance. In rural areas, the institutions are much less concentrated, requiring greater driving time. However, these remote sites are more inclined to accept mobile services since alternative care is not as accessible.

For a mobile clinic which is designed for general optometric care, choosing the correct area is much more critical. In large cities, or more densely populated suburban areas, alternative eye care is readily accessible. A mobile clinic will not be successful with such competition, unless specialty services are provided, which are not already

available. However, in rural areas, where alternative eye care is not as accessible, the mobile clinic stands a much greater chance for success. Small, remote communities are usually very pleased when a new doctor decides to practice in town, however, this is not a guarantee that patients will be knocking down the door as soon as the clinic rolls into town. Keep in mind that rural residents, in general, are accustomed to driving great distances for many commodities. So Quality eye care is essential, because the clinic is still competing with the nearest larger cities, in an indirect manner.

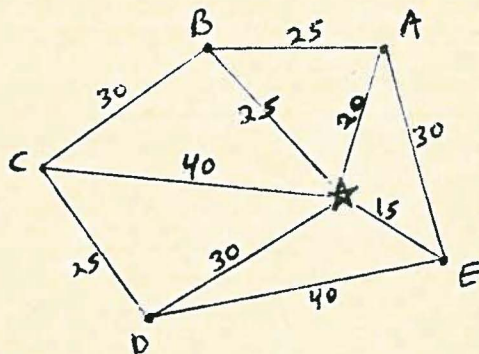
Just as satellite clinics are an extension of the main office, the mobile clinic also needs a home base, a place to originate the whole operation, to schedule appointments, and to refer the more difficult, time consuming cases that cannot be handled in the trailer. Ideally, this home office should be centrally located. Not necessarily geographically centered, but rather, it should be located in the midst of the most densely populated section of the area. The main office might have a full-time optometrist, while an associate operates the mobile clinic. Or if the main office is not as busy, a single optometrist could run the whole show.

The size of the area will depend on the number of mobile sites, and their distance apart. Each site should be carefully selected, taking into consideration the local population figures, and the distance to the nearest alternative eye care, including your own main office, since the mobile clinic will also be competing against it. Although mileage figures will vary, depending on the local population

density, each mobile site should be a minimum of 10 - 15 miles from the nearest alternative care, including your main office and the other mobile sites. Obviously, if the area is too small, the mobile clinic will only be competing against itself, making the effort fruitless.

On the other hand, if the area is too large, or too many sites are visited, it becomes difficult to visit each site frequently enough to provide adequate care. Ideally, in a general practice, each site should be visited at least once a month, preferably every two weeks. If the clinic is not available that often, patients will be inconvenienced, and drive to other sources of eye care where services are always available. So you must be careful not to spread yourself too thin.

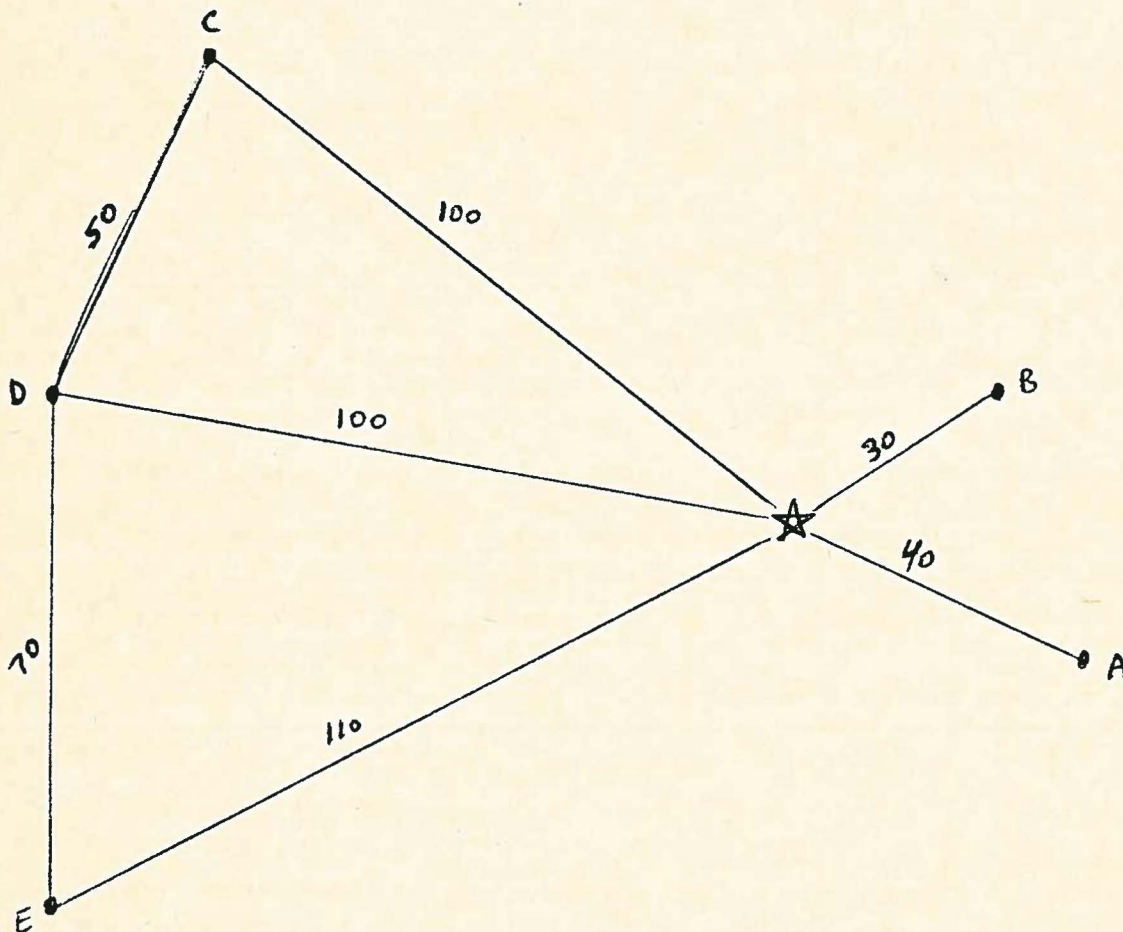
Lets examine several possible situations. First, a relatively small area, with a centrally located office.



Lets say the clinic drives from home base (★), to site A, then back on Monday; to B and back on Tuesday; to C and back on Wednesday, etc. Total mileage for all five sites is 260 miles. Now, lets say the clinic drives from home to A on Monday, directly from A to B on Tuesday, directly from B to C

on Wednesday, etc. Now the total mileage is only 155 miles, a savings of approximately 100 miles. At about 10 MPG, you have saved 10 gallons of fuel. On the other hand, four nights on the road make the savings insignificant, even if you slept in the trailer and prepared your own meals.

Now lets consider another situation, with a larger area and a main office less centrally located.



Obviously, sites A and B can be covered without overnight stops. However, from base to C and back, base to D and back, etc. covers 620 miles, while base to C, to D, to E and back is only 330 miles. Considering driving time and distance, it is now worthwhile to stay overnight and take the direct route from C to D to E.

As you can see, there are many factors to consider when choosing sites and arranging a schedule. Careful scheduling and cost controls are necessary to maximize the effectiveness of the mobile clinic.

SCHEDULING

The clinic schedule will depend, to a great extent, on the demographic aspects of the area, as just discussed. For large areas with just a few sites, it may be more effective to visit each site once a month, for several days at a time, rather than a single day every two weeks. In general, the schedule should reflect the relative demand at each site, allotting greater time for the more densely populated areas.

The traveling schedule should be "advertised" well in advance. Local newspapers, radio, and community bulletin boards can be utilized to announce the upcoming schedule at each site. The clinic schedule is easily remembered by patients if you visit on a routine basis, for instance, every first and third Tuesday of the month. This way, patients can plan ahead for routine office visits such as frame adjustments, dispensing and other follow-up care.

Ideally, patient scheduling should be handled by the main office, since it is impractical to employ individual answering services at each site. In large areas, a toll-free number to the main office will encourage patients to make the long-distance phone call for an appointment. A mobile telephone in the trailer will allow communication between the main office and the clinic. This is convenient in case of last minute schedule changes, or office emergencies.

If the clinic will be used overnight, personnel scheduling becomes a factor. Although the trailer is equipped for overnight accommodations, and completely self-contained, personal arrangements for employees have to be agreed upon ahead of time.

VEHICLE INFORMATION

There are several types of vehicles available, any of which could be remodeled into a clinic. But some of them have serious disadvantages, which make them quite impractical.

First, there is the 'Winnebago' type RV, with its self-contained engine and driving compartments. These vehicles make very beautiful, impressive clinics. But the major disadvantage is their lack of mobility. A trip to the corner restaurant requires moving the entire clinic. It is possible to tow a compact car behind the RV, just for local driving, but this even further reduces the poor mileage which these RV's are notorious for. Mileage with an RV varies from 2 - 10 MPG, depending on driving conditions, vehicle weight and design, and whether the engine is diesel or gasoline. The price for a 30'-32' RV with standard equipment, before remodeling, ranges from \$35,000 to over \$100,000, somewhat more expensive than the other alternatives.

There are several types of trailers which could be used. A semi trailer would provide plenty of room, but extensive remodeling would be necessary, including windows, electricity, lighting, plumbing and heating. These trucks also require a special drivers license.

Fifth wheel trailers, with the overhanging front end, have plenty of storage space, but less usable clinic space, which is more important when the clinic gets crowded. They are also considerably heavier, requiring special suspension on the towing vehicle.

Finally, the standard travel trailer, which is the best choice since it does not have most of the disadvantages already mentioned. The price for a 30' trailer with standard equipment ranges from \$12,000 to \$16,000.

Remodeling will involve adding or removing a few partitions, adding more specialized lighting, and replacing some furniture with office equipment. With careful planning, the handyman carpenter might venture to remodel it alone, but for a very professional result, consider hiring a contractor for the finish work, particularly the electrical modifications.

Some trailer manufacturers will customize trailers to any floorplan desired, right in the factory. Also, some manufacturers will provide an unfinished trailer shell, which then can be customized by a company which specializes in van and trailer conversions. The least expensive way is to buy a trailer with standard equipment, and a floorplan that can be easily converted, and remodeling it yourself as much as possible.

The clinic for a general optometric practice should contain four basic areas: reception, screening, refracting and a restroom. Included at the end of this paper is one of many floorplans which are possible, utilizing these four areas.

The reception/waiting area has room for six people comfortably. The typical booth and table seating arrangement has been replaced by a sofa and three chairs. The room needs a lot of windows, so the waiting patients will not feel too claustrophobic. This area doubles as a living room, and the sofa folds out into a bed for sleeping.

The screening area should be quite large, since in a general practice, this area is used for preliminary testing, frame selection and dispensing, and all business affairs. The area doubles as a kitchen and dining room. Counter space can be increased by using a small refrigerator that fits underneath, and by covering the stove with a portable counter top. This allows room for lensometer, typewriter, salt box, etc. For screening instruments such as the NCT, keratometer and Titmus screener, consider using a rotating table, which allows the patient to take all tests from one seat. The Snellen acuity chart is located down the hall, on the bathroom door. Storage is provided by overhead cabinets above the kitchen appliances.

As already mentioned, the refraction lane should have a mirror projection system and wall mounted instrument stand because of limited space. Storage cabinets and countertops are installed where ever possible. To help control lighting, inside shutters or shades can be placed over the windows. This room doubles as a bedroom, by using a folding cot, or an overhead folding bed.

The bathroom requires at least 20 square feet of space for a shower, chemical toilet and sink. Needless to say, this room does not double as anything else.

All utilities are self-contained, including water, sewer, gas and electric. Water and sewage must be handled by an appropriate service station. LP gas operates the furnace, water heater, stove and generator. The electrical generator can be supplemented by an extension cord if external power is available.

Other minor modifications to consider are sliding doors, to save space. A removable wheel chair ramp at the front door may be necessary if the clinic visits nursing or handicapped facilities. However, a wider door will have to be installed to accommodate wheelchairs.

If this sounds like a lot of equipment to fit into a travel trailer, you are correct. A minimum trailer length of 25' is required, and that will be tight. Trailers are available up to 40' long, but the added weight and length make it very impractical to tow. A good compromise is a 30' trailer, which is enough space to adequately suit the purpose. The approximate interior width is 7'6", and interior height is 6'4". The hitch weight can range from 500-850 pounds, and the total weight from 5500 - 7500 pounds, for a 30' trailer fully equipped. The fuel economy is affected more by wind resistance and weight, rather than trailer length. Trailer manufacturers are happy to provide exact specifications and floorplans upon request.

One disadvantage of a trailer is that, because of its weight, a special vehicle is required to pull it. In general, the towing vehicle will need heavy duty suspension, brakes, and cooling system; a high horsepower engine

combined with a high axle ratio; and a weight distributing hitch with sway bar. Automatic transmission is recommended over manual, for ease of operation, especially on hills. Four-wheel drive is a good option, if the trailer is to be used in inclement weather. A diesel engine will result in better gas mileage, but that advantage is offset by the greater expense of a diesel option, approximately \$1500 - \$2000 more.

The estimated mileage while pulling the trailer with a large diesel engine is 12-15 MPG, highway, and 7-9 MPG in the city. A gasoline engine of comparable horsepower gets approximately 8-12 MPG highway, and 4-7 MPG in the city. Assuming an average of 12 MPG, diesel, and 8 MPG, gasoline, it will require about 30,000 miles before the diesel has paid for itself, depending on the fluctuating price of fuel.

The cost of a suitable towing vehicle, without diesel, four-wheel drive, or other luxuries, is a minimum of \$9,000 to \$12,000 for a pick-up truck. The price may rise to \$15,000-\$18,000 for a fully loaded truck with the above options. For best performance, provide the auto dealer with the trailer type, length, hitch weight and total weight, and he can design the best towing vehicle for your specific needs.

PARKING

Since the clinic is self contained, it does not require any external hook-ups when it is parked. Some needy communities may donate a parking space, and sometimes they may even provide electricity. However, if parking space must be rented, it is best to choose a site with plenty of traffic, for maximum exposure, and adequate patient parking. Check with the local government for zoning restrictions and any other limitations they might impose.

Parking rental should be determined on a daily basis, for instance, two days per month, per location. Lets assume the clinic will be used an average of three days a week. A parking fee of \$20 per day results in an annual fee of about \$3000. Suppose the daily fee was \$30 per day, because of a better location, or an outside electrical source. Now the annual fee is \$4500. The fee will depend on how good of a working relationship you develop with each community. If you can really promote the clinic positively, do not be surprised if the parking space is provided at no charge.

LEGAL INFORMATION

State laws are so variable, that a legal consultation is advised, to interpret the public health code, and any restrictions that might apply. The state optometric association usually has a legal counsel who would be able to find this information. Also check with the state optometric board to determine if there are any restrictions in the optometry law. Finally, the local government at each mobile site should be checked for any local limitations.

The Michigan optometry law, part 174 of the Public Health Code (333,17401-.17431), does not state any specific restrictions regarding a mobile optometry clinic. The Public Health Code, in general, does not prohibit the use of mobile clinics, provided that qualified, licensed personnel are performing all diagnostic tests. For example, the Lions Club 'Sight Mobile' has had problems because of unqualified personnel performing tonometry.

In general, as long as no other laws are being broken, such as misleading advertising, or trailer regulations, then a mobile optometry clinic is not restricted by the Michigan Compiled Laws of 1979.

EXPENSES/COST-EFFECTIVENESS

Initial Costs:

A 30' trailer with standard equipment costs \$12,000-\$16,000. Remodeling will be \$1000-\$3000, depending on how much is done by yourself, and the extent of remodeling required. An LP generator costs about \$3000. Optometric and business equipment can cost anywhere from \$20,000-\$30,000, depending on whether it is new or used, and whether it is deluxe or standard. Total trailer costs, fully equipped, ranges from \$36,000-\$52,000. Add the cost of a towing vehicle, \$10,000-\$18,000, and the total initial investment is \$46,000-\$70,000.

Annual Costs:

Travel costs, based on mileage of 10 MPG, fuel at \$1.25 per gallon, maintenance at \$500 per year, and an average of 15,000 miles per year, calculates to about 16¢ per mile, or a total of \$2400. Parking rental ranges from \$0 - \$4500. And one employee at \$10,000-\$12,000 for a 3-4 day week, brings the annual operational expense to \$12,400-\$19,000.

Total expenses over a five year period can range from \$108,000-\$165,000, including the initial cost of the vehicles. At \$30 per exam, and a three day clinic week, it will require 5-8 exams per day to break even. If the demand is great enough to provide an average of 10 exams per clinic day, the profits may range from \$9,000- \$22,500, not including profits from materials.

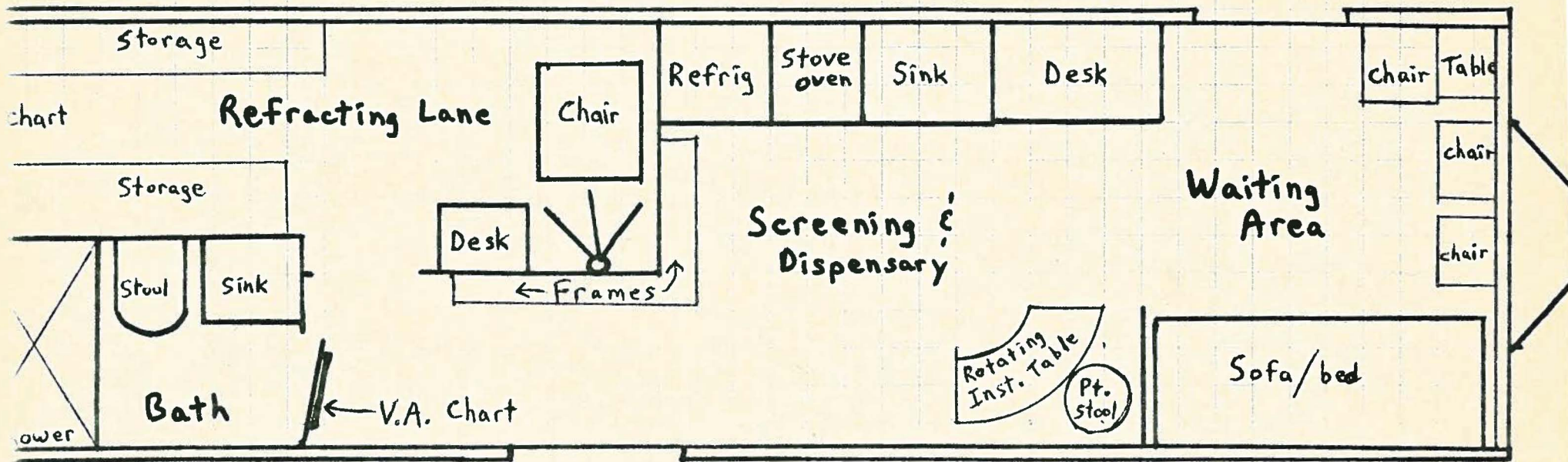
CONCLUSION

To the skeptical mind, this probably sounds like a far-fetched idea, and a lot of work for a limited return. However, I approached the whole project with an optimistic attitude, as an alternative practice mode that deserves serious consideration.

By far, the most important factor is finding the right area to operate the clinic. In some parts of the country, it is difficult to find large isolated areas that do not already have available eye care. However, there are areas which can support a mobile clinic, especially the Great Plains states, North-Central states, and rural Appalachian areas. In Michigan, the widely scattered population in the U.P. is a fine example of an area where a mobile clinic could be successful.

Although the initial investment is substantial, the range in price is great enough to accommodate most budgets. Actually, the expenses are not that different than those incurred while setting up a satellite office, and the flexibility is far greater with a mobile clinic. As seen in the cost-effectiveness totals, if the demand is sufficient, a reasonable profit can be made from the clinic. But more important is the satisfaction derived from providing services to a needy population, who otherwise might neglect their eye care because of a lack of local availability.

And finally, you can remove all of the optometric equipment and load up the family for a long camping vacation, which is not possible with a satellite office!



BIBLIOGRAPHY

Since this is an innovative idea that has not been utilized to any extent, the literature is virtually non-existent. The following people are to be credited with providing the pieces of information required to assemble this paper.

Dr. Ed Hamilton, who operated several mobile optometry clinics for the Indian Health Services.

Mrs. Morton Zucker, wife of the late Dr. Morton Zucker, who organized mobile clinics for the institutions in N.Y.

Mr. Lawrence Glazer, legal counsel for the MOA.

Dr. William Dansby, executive vice-president of the MOA.

Dr. Jack Hill, chairman of the Michigan state board.

Mr. Kevin Westcott, regional mgr. for LionsClub Sight-Mobile.

A dozen trailer manufacturers.

Several automobile and truck dealers.

Several librarians.

And finally, Dr. Robert Carter, for starting me in the right direction.

All prices are 1983 estimates.