Microcomputer Applications in the Management of Paratransit Operations

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INTRODUCTION

Small paratransit systems have provided a substantial amount of transportation services for elderly and handicapped persons in both the urbanized and nonurbanized areas of the United States. To be successful, these systems must function as small businesses in a hostile economic and geographic environment for transportation operations. All of these systems are facing a complete cutoff of transit operating subsidies in urban (Section 5 of the Urban Mass Transportation (UMT) Act, as amended) and rural areas (Section 18 of the UMT Act), as well as other cutbacks in local, state, and Federal human services budgets. On the expense side of the ledger, costs of labor, petroleum products, insurance, and materials used in the production of transportation services have risen to unprecedented levels. In the face of these reduced financial resources and upwardly spiralling costs of operation, managers of paratransit systems are asked to raise the level of service to meet accessibility and mobility requirements of a growing population of elderly and handicapped persons.

The technological advances in the field of microcomputer systems offer some real opportunities to assist in the improvement of small paratransit operations and management in practical and readily implementable terms. The retail outlet availability and low cost of microcomputer systems, combined with the low skill level requirements for their use, offer a great potential for short- and long-term solutions to the increasing productivity demands made on the management and operations personnel of these systems. However, recent experience in the adaptation of computer technology suggests that much depends on forethought and on sensitivity to the operational environment of paratransit systems for the successful insertion of this technology. This paper reports on a project which tries to provide the opportunity for some experimentation and analysis on the adaptation of microcomputer technology to the process of managing and operating paratransit services.

I. CONTEXT OF THE PROJECT

The setting for the project is the New England Region of the United States. It is an area which has consistently been active in cooperative intergovernmental efforts to search for and provide solutions to the problems of transportation service delivery for elderly and handicapped persons. A principal focus of this activity has been the Office of Technology Sharing of the U.S. Department of Transportation's Transportation Systems Center (TSC) in Cambridge, Massachusetts.

In the past, TSC's Office of Technology Sharing has been particularly successful at defining problems in the provision of public transportation services and providing the opportunity for the private sector to find a solution through state-of-the-art, or near start-of-the-art, technology. In the context of this project, it was the position of TSC's Office of Technology Sharing that, if a technology gap existed, and if the microcomputer industry could be shown the management information needs of the paratransit industry and the size of the potential market, the private sector could close the gap faster than the Federal government could. Thus, the project proceeded on an informal basis to test the following on the application of microcomputer technology for paratransit operations:

- the availability of low-cost, off-the-shelf microcomputer hardware,
- the availability of low-cost, off-the-shelf microcomputer software,
- the absence of the necessity for any previous experience in the operation or programming of computers for application in a business environment;
- given the above, the application of microcomputer systems would provide a positive total cost/benefit ratio for small paratransit operations.

A. CONVENOR ROLE

TSC's Office of Technology Sharing assumed the role of the convenor authority for the project. It took on the responsibility for:

- providing a centrally located meeting facility,
- assisting in definition of the problem,

- assisting in the analysis and synthesis of findings, and
- liaison for technical assistance within TSC and the private sector.

The Chief of TSC's Office of Technology Sharing assumed the role of project director.

B. USERS' GROUP

A users' group was formed by three organizations from three private nonprofit operators of elderly and handicapped transportation services for the first phase of the project. They are: Regional Transportation Program, Inc. (Portland, Maine); Call-A-Ride of Barnstable County, Inc. (Hyannis, Massachusetts); and the Human Services Transportation Consortium (Bridgeport, Connecticut). All members of the users' group had organized and maintained manual management information systems and were at various stages of considering computerization of those systems.

C. THE PROTOTYPE SYSTEM

The project principals were all cognizant of the hazards of conducting a demonstration project or implementing a computer system in an operational environment. Therefore, it was decided to develop and test a prototype microcomputer system using the Call-A-Ride of Barnstable County, Inc., (CAR) system as the test facility or laboratory. CAR, a research and training private nonprofit corporation, had initiated a first round elderly and handicapped transportation system under the first round of the Section 16(b)(2) (UMT Act) program (1975), and a second round rural public transportation project under the Section 147 (Federal-Aid Highway Act) program (1977). In 1979, the recently formed Cape Cod Regional Transit Authority awarded the fleet operations to a private-for-profit provider.

Therefore, CAR had the opportunity to develop a microcomputer system prototype using actual operating data without having a disruptive effect on the operation of essential transportation services. The Massachusetts Executive Office of Transportation and Construction and the U.S. Urban Mass Transportation Administration provided the initial capital assistance through

an amendment to an existing Section 16(b)(2) grant to provide $5,706 (U.S.) of Federal funds for the initial microcomputer components. However, there was no financial assistance available for noncapital expenditures. The President of the CAR corporation assumed the responsibilities of principal investigator for the project.

II. MICROCOMPUTER CONSIDERATIONS

The application of computer technology is clearly helpful for meeting the requirements for the collection of large amounts of data on operations, the storage of that data, and the generation of a variety of reports in a short period of time. However, the significant capital requirements of computer systems and the absence of data processing technicians in an operation of this size rule out the installation of most large-scale and minicomputer-based systems. The unique and frequently changing reporting requirements of small paratransit systems also rule out the economical use of standard packages from service bureaus. Most importantly, any application of computer technology should utilize the present in-house capacity for conceptualization of data processing, design of data collection instruments, use of reports and analysis for decision-making operations, and administration of the manual information system. Implementation of any system would have to take place without any disruption of the present capacity for collection, storage, and retrieval of data.

Clear distinctions between the applicability of minicomputers and that of microcomputers to particular small business operations are becoming increasingly difficult as micro systems increase in power and capability, and as minicomputer manufacturers reach for the small business market. For an exploration of this phenomenon, and for a comparison of most mini- and microcomputer systems, refer to: Interface Age, "Looking at Micro-based Business Systems", June 1980, by Tom Fox, and "Make Way for Minis - Minis Merge with Micros in the Small Business Market", May 1981, by David Holcomb.

A. IMPORTANT FACTORS IN THE INITIAL CONSIDERATION OF THE APPLICATION OF MICROCOMPUTER HARDWARE

1. Internal Memory Capacity

Internal memory capacity, particularly Random Access Memory (RAM), is important for applications which require the active storage of the program and data. For example, complex social service agency budgets and lengthy government contracts require storage in RAM for manipulation and editing,

respectively. Secondly, some programs and computer languages consume large amounts of RAM in their operation. Therefore, one must make sure that one's applications can be accommodated by the internal memory capacity of the system.

2. External Storage

External storage is of particular importance for transportation providers with extensive record keeping requirements. Both the manner of storage and the ultimate data storage capacity of the systems are critical. For example, human service grantors require records on individual passengers, including program identification numbers, dates and destinations of trips, and other information. These records must be in storage and readily retreivable for a period of years, awaiting state and Federal audit. Hobbyists and personal computing applications have found storage on standard tape recorded cassettes to be adequate. However, in terms of storage capacity, reliability, and access, disk storage systems are mandatory for business applications. Particularly helpful articles about disks are: Scientific American, "Disk Storage Technology", August 1980, by Robert White, and Popular Electronics, "Basics of Computer Disk Systems," November 1980, by Les Solomon.

3. Programming

The ability to apply a microcomputer system to a real-world operational situation without any on-site programming expertise is a major distinguishing feature of the micro when compared to its larger cousins. The project revealed that, in virtually every area of business application, there is a program available for purchase. That is not to say that they are of universally high quality, nor that all are well documented for use by the novice. It does support the initial hypothesis that the private sector is rushing to meet the demand created by the small business market. In some isolated circumstances, the state of the art is at a mail-order-catalog level of utility.

4. Environmental Conditions

As most providers of elderly and handicapped transportation services eschew elegant environments in order to provide cost-effective levels of service to their clients, strict environmental controls and expensive installation requirements would not be appropriate. Microcomputers, in contrast to larger computers, have a fairly high tolerance for temperature and humidity changes and use standard household current.

5. System Cost

The bottom line consideration for the application of any microcomputer system for a paratransit operator is total system cost. The minicomputer-based management information systems are estimated at $25,000 to $70,000 (U.S.) for hardware and software, and that generally does not include system maintenance and training costs. This price range effectively prices out the majority of small paratransit operators who would generally put several vehicles on the road if they had that amount of money available. The promise of this project was that a microcomputer system could be implemented for under $10,000 (U.S.) for hardware and software components, and that maintenance and training would be acceptably low.

III. USER REQUIREMENTS FOR MICROCOMPUTER APPLICATIONS

Based on a review of the Call-A-Ride manual management systems, the following list of requirements was drawn up for a prototype microcomputer application.

A. DATA BASE MANAGEMENT

- Individual client records,
- system use records (see Tables 4a and 4b on pages 20 and 21),
- vehicle scheduling,
- vehicle and equipment maintenance records,
- inventory control, and
- communications interface.

B. PLANNING AND EVALUATION

- Vehicle utilization matrix analysis (see Table 1 on page 17),
- direct and indirect cost allocation (see Table 1 on page 17),
- individual program budgeting (see Table 3 on page 19),
- unit cost pricing estimation (see Table 3 on page 19),
- personnel requirements (driver schedules),
- performance measurement (see Tables 4a and 4b on pages 20 and 21), and
- multicolor graphic displays (CRT) (see Tables 5 and 6 on page 22).

C. FINANCIAL MANAGEMENT

- Double entry accounting systems,
- monthly program income and expense sheets,
- cash flow projections, and
- aging of accounts.

D. WORD PROCESSING AND MAILING LISTS

IV. SEARCH OF THE LITERATURE AND THE MARKETPLACE

A search of the periodical and popular literature on personal computing and microcomputer applications was conducted over a 12-month period. It revealed a plethora of readily available publications with a wide range in consumer interest, from the novice to the microcomputer technician. In addition, users' groups, such as the Boston Computer Society and manufacturer-supported groups, have been active in disseminating information about this burgeoning technology.

An informal survey of the marketplace was accomplished by the project principals by visiting retail outlets in the Northeastern United States, attending computer shows, contacting manufacturers, and sharing the research from related projects in progress at TSC. The survey revealed that those technological gaps which existed at the conception of the project in 1979 (in terms of the application of the microcomputer technology to the management of small paratransit services) were now state-of-the-art technology. What remained was the application of that technology through the prototype development, and the proper insertion of that technology into an operating environment.

V. COMPONENTS OF A MICROCOMPUTER BUSINESS SYSTEM

Based on the specifications of the CAR system and the review of the literature and the marketplace, the following minimum components for a paratransit system were designed.

A. HARDWARE

- A central processing unit with a minimum of 48K RAM,
- a video monitor,
- a Disk Operating System (DOS) with at least two disk drives,
- a high quality printer, and
- a modem for communications interface.

B. SOFTWARE

- A data base management system including mailing lists and a user-formatted reports generator,
- a financial planning or statistical analysis program,
- a graphics program, and
- a word processing program.

VI. SELECTION OF HARDWARE AND SOFTWARE CRITERIA

In view of the potential for replication among the regional members of the users' group, and possibly among peer providers across the nation, some care was taken in formulating the criteria used to evaluate the available microcomputer hardware and software. The criteria used is as follows.

- The initial microcomputer system should have the capacity described in Section V, and have the capacity for expansion of software and peripherals.
- The manufacturer should have nationwide product availability through retail outlets.
- There should be nationwide availability of service (repair) and applications support.
- The system should have a reputation for reliability.
- The prototype system should be highly portable and tolerant of environmental extremes.
- The prototype system should have a color graphics capability to enhance the educational/implementation process.
- Most importantly, the hardware should be supported by high-quality, high-reliability, well documented software.

VII. STATUS OF PROTOTYPE DEVELOPMENT

During the preparation of this paper, a microcomputer system was purchased and is currently in service at the CAR test facility.

A. SELECTION

A microcomputer system (Apple II Plus), containing all the components noted in Section V with the exception of a modem and financial management software, was selected. These important elements of the project will be implemented when additional funding is available.

B. STATUS OF THE PROTOTYPE SYSTEM DEVELOPMENT

While awaiting the delivery of the Apple II, the project has had the availability of an Apple III Information Analyst package to initiate the project. Because of the opportunity to use the Apple III's powerful 128K RAM with the equally powerful analytical software (Visicalc III), initial work started on the planning and evaluation (Section III) specifications.

The project experience showed that, as a software package, Visicalc takes about four hours for the novice to master. Visicalc is a large "electronic worksheet" with 60 columns and 254 rows. This lends itself to the CAR management system which is built around a series of matrices, as are most paratransit systems.

1. Vehicle Utilization Chart

A printout of CAR's vehicle utilization chart, on Visicalc, can be found in Table 1 (see page 17). The matrix enables the paratransit manager to organize the hours per day of each vehicle's use according to the program funding source.

2. Allocation of Costs

By comparing the program totals of vehicle use to the total available vehicle hours, a percentage figure can be obtained for allocating indirect costs among programs. (See the bottom line of totals in Table 1 on page 17.)

3. Program Budgeting

CAR's program involved a number of distinct transportation services with multiple funding sources in a constant state of change. (See Table 2 on page 18 for a statement of Visicalc's capacity to automatically recalculate the entire model, make accomodation of these changes readily apparent, and assist in the determination of their impact on the total program.)

4. Individual Program Budgets and Unit Cost Determination

Table 3 (see page 19) shows a printout of an individual program budget (health care) loaded on a Visicalc model. What cannot be shown is the interactive relationship among the values in the budget. Any change in the items automatically changes the subtotals and totals. The unit cost determination value is derived from a simple algebraic formula (rather than an arithmetic expression), so that any change in total costs or projected units of service automatically changes the unit cost value.

5. Statistical Analysis and Performance Measurement

Using CAR's standard monthly statistical report from April 1976 to May 1979, a matrix was devised on Visicalc consisting of some 40 columns and 76 rows. Due to obvious space limitations, only the beginning and end of the matrix can be printed for this publication (see Tables 4a and 4b on pages 20 and 21). Beyond having the capability to scan your operating statistics readily over an extended period of time, Visicalc allows the manager to create his/her own performance measures. The model allows him/her to compare values simply by locating them by column and row (not shown in the printout). Thus, by simply locating the value for the number of passengers for a month and the

number of trips in the respective column and row, he/she can create a passenger/trip performance indicator for the month. Then, through a "replicate" command, the program performs the same function on all the monthly statistics. Based on these statistics, graphics can be produced using a graphics program (see Tables 5 and 6 on page 22).

Other elements of the prototype development are underway. A data base management program has been purchased and will be implemented when all system components have arrived. Several financial management packages have been reviewed and will be tested if sufficient financial resources can be obtained to purchase them. Word processing programs are being analyzed and one, the Apple Writer, is being tested.

At this stage in the development of the prototype system, it is clear that the increased management analysis and program control capability that the microcomputer and programs like Visicalc can give the paratransit manager is of major importance in providing cost-effective management. The utility of microcomputer data base management systems appears to be dependent on the ability to organize a program's data requirements and operations, and on the ultimate dimensions of the required data base. The financial management software, particularly the capacity for timely invoicing and communications interfacing, has particular promise for lowering the cost of operation.

TABLE 1. CALL-A-RIDE OF BARNSTABLE COUNTY, INC.,
VEHICLE UTILIZATION CHART - FY 1979

CALL-A-RIDE OF BARNSTABLE COUNTY, INC.
VEHICLE UTILIZATION CHART - FY 1979

Vehicle Code #	Transportation Program d-r E&H	Therapy	Ad Day Ca	Dialysis	Nutrition	Food Del.	Sh. wkshp	OCM-Bos.	OCM-Pond.	Daily TOTv/hrs.
A1	5	0	5	0	0	0	0	0	0	10
A2	5	0	0	0	0	0	3	0	0	8
A3	3	5	2	0	0	0	0	0	0	10
A4	5.6	0	2	2.4	0	0	0	0	0	10
A5	0	0	0	0	0	0	0	0	0	0
B1	0	0	3	0	4	1	0	0	0	8
B2	0	0	0	0	3.5	1.5	0	0	0	5
B3	0	0	0	0	4	.5	5.5	0	0	10
B4	0	0	0	0	4.5	.5	2	0	0	7
C1	0	0	0	0	0	7	0	0	0	7
C2	0	0	0	0	0	0	0	0	6	6
C3	0	0	0	0	0	0	0	4	0	4
C4	0	0	0	0	0	0	0	0	0	0
TOTALS	18.6	5	12	2.4	16	10.5	10.5	4	6	85
c.f.TVH	21.88	5.88	14.12	2.82	18.82	12.35	12.35	4.71	7.06	100.00

TABLE 2. CALL-A-RIDE OF BARNSTABLE COUNTY, INC., PROGRAM FUNDING MATRIX - FY 1979

CALL-A-RIDE OF BARNSTABLE COUNTY, INC.
PROGRAM FUNDING MATRIX FY 1979

Transport Program	Funding Sources								
	Title III	Title VII	Title XIX	Title XX	Nurs Hms.	CC Collab	Hndsr NH	Yar CETA	Kelley Fnd.
d-r E & H	20000	0	10000	18000	0	0	0	0	0
Therapy	0	0	10000	1500	0	0	0	0	0
Ad. Day Care	0	0	18000	1500	0	0	12000	0	0
Dialysis	0	0	6000	1000	0	0	0	0	0
Nutrition	0	49600	0	0	0	0	0	0	0
Food Del	0	23300	0	0	0	0	0	0	0
Sp. Educ.	0	0	0	0	0	27000	0	0	0
OCH/Boston	0	0	2000	0	0	0	0	5490	0
OCH/Pondvill	0	0	0	0	0	0	0	7630	0
Sp E & H Grp	0	0	0	0	4000	0	0	0	950
Trainins	0	0	0	0	0	0	0	6575	0
TOTALS	20000	72900	46006	22000	4000	27000	12000	19695	950
Fnd S/TOT S	6.86	25.00	15.78	7.55	1.37	9.26	4.12	6.76	0.33

Priv.Don.	Voc. Rehab.	Trainins	Other	CCRTA/S.18	TOTALS	PROG /TOT. P
0	0	0	0	20357	68357	23.45
2000	0	0	0	0	13500	4.63
2000	0	0	0	0	33500	11.49
1000	0	0	0	0	8000	2.74
0	0	0	0	11969	61569	21.12
0	0	0	0	5674	28974	9.94
0	2000	0	0	0	29000	9.95
6000	0	0	0	0	13490	4.63
5000	0	0	4000	0	16630	5.70
2000	0	0	0	0	6950	2.38
5000	0	0	0	0	11575	3.97
						0.00
23000	2000	0	4000	38000	291545	100.00
7.89	0.69	0.00	1.37	13.03	100.00	

TABLE 3. CALL-A-RIDE OF BARNSTABLE COUNTY, INC.,
HEALTH CARE TRANSPORTATION PROGRAM BUDGET - FY 1979

CALL-A-RIDE OF BARNSTABLE COUNTY, INC.

HEALTH CARE TRANSPORTATION PROGRAM BUDGET FY79

PART I Direct Costs:			
A. Personnel			
Dispatcher	5164		
Drivers	19372		
Sub-Drivers	4312		
Fringe(15%)	3803		
sub-total		32651	
B. Other Direct Costs:			
Veh. and Office Equipmnt	800		
Gas and Oil	5000		
Maint and Repair	2000		
Insurance	5659		
Licenses	65		
Communications	2888		
Space	1000		
Utilities	500		
sub-total		17912	
Total Direct Costs:			50563
PART II Overhead Costs:			
25% of Total Direct Costs			12641
TOTAL COSTS (Parts I & II)			63204

UNIT COST DETERMINATION:

Estimated Units of Serv:	7200
Unit Cost (Cost/trip):	8.78

TABLE 4a. CALL-A-RIDE OF BARNSTABLE COUNTY, INC., S. 16(bX2) STATISTICAL REPORT OF: HEALTH AND NUTRITION TRANSPORTATION

CALL-A-RIDE OF BARNSTABLE COUNTY, Inc.
S. 16(bX2) Statistical Report of:

Health and Nutrition Transportation

1976 APR	MAY	JUNE	JULY	AUG	SEPT
DIRECT SERVICE						
Health Care:						
Undup PAX this mo.	83	97	125	168	190	243
New PAX this mo.	83	69	91	87	106	129
Cumltiv Undup PAX	83					
Undup E PAX	77	78	88	117	127	165
Undup E&H PAX	6	19	33	37	44	55
Undup H(n-E) PAX	0	0	4	14	19	23
NutritionTranspt:						
Undup PAX this mo.	0	0	0	0	0	0
New PAX this mo.	0	0	0	0	0	0
Cumltiv Undup PAX	0	0	0	0	0	0
Undup E PAX	0	0	0	0	0	0
Undup E&H PAX	0	0	0	0	0	0
FREQ. OF SERVICE						
Health Care:						
No. Med. trps(1wy)	231	269	486	669	718	1058
No. E Med trps	NA	NA	313	400	394	621
No. E&H Med trps	NA	NA	136	161	206	278
No. H(n-E) Med trp	NA	35	37	106	118	148
No. no-shows (mo.)	0	5	9	2	3	11
No. not possible	NA	NA	NA	NA	NA	NA
No. missed trips	NA	NA	NA	NA	NA	NA
Freq/PAX (0-4)	73	88	105	NA	157	199
Freq/PAX (5-10)	10	6	11	NA	20	23
Freq/PAX (11-15)	0	3	5	NA	4	9
Freq/PAX (16-20)	0	0	3	NA	7	6
Freq/PAX (21+)	0	0	1	NA	2	6
Nutrition Transprt						
No. site trips	0	0	0	0	0	0
No. shopping trps	0	0	0	0	0	0
No. home del. trps	0	0	0	0	0	0
No. other trips	0	0	0	0	0	0
No. of no shows	0	0	0	0	0	
VEHICLE STATISTICS						
Total miles:						
d-r Health	4900	4315.9	9162.4	11159	12561	16421
nutri sites	0	0	0	0	0	0
food del (HOW)	0	0	0	0	0	0
Total vehicle hrs:						
d-r Health	344	352	544	632	672	664
nutri sites	0	0	0	0	0	0
food del (HOW)	0	0	0	0	0	0
PERFORM. MEASURES						
AV. Mi/veh/day:						
d-r Health						
nutri sites						
food del (HOW)						
PAX/veh hr:						
d-r Health	0.67	0.76	0.89	1.06	1.07	1.59
nutri sites						
CONSOL. HST STATS.						
Total HST PAX(und)	83	97	125	168	190	243
Total HST TRPS	231	269	486	669	718	1058
HST PAX/HST V HRS	0.67	0.76	0.89	1.06	1.07	1.59

TABLE 4b. CALL-A-RIDE OF BARNSTABLE COUNTY, INC., S. 16(bX2) STATISTICAL REPORT OF: HEALTH AND NUTRITION TRANSPORTATION

CALL-A-RIDE OF BARNSTABLE COUNTY, INC.
S. 16(BX2) Statistical Report of:

Health and Nutrition Transptation

	1978 DEC	'79 JAN	FEB	MAR	APR	MAY
DIRECT SERVICE						
Health Care:						
Undup PAX this mo.	234	244	212	236	227	222
New PAX this mo.	42	55	37	31	28	44
Cumltiv Undup PAX	945	1030	1067	1098	1126	1170
Undup E PAX	103	109	80	84	108	87
Undup E&H PAX	109	112	104	119	88	105
Undup H(n-E) PAX	22	23	28	33	31	30
NutritionTranspt:						
Undup PAX this mo.	197	218	175	190	195	180
New PAX this mo.	13	29	18	18	16	7
Cumltiv Undup PAX	461	490	508	526	542	549
Undup E PAX	130	176	137	147	146	135
Undup E&H PAX	67	42	38	42	49	45
FREQ. OF SERVICE						
Health Care:						
No. Med. trps(1wy)	1535	1654	1490	1661	1425	1865
No. E Med trps	449	528	399	405	400	527
No. E&H Med trps	818	834	858	934	691	814
No. H(n-E) Med trp	268	292	233	322	334	524
No. no-shows (mo.)	14	6	8	4	12	15
No. not possible	0	6	28	31	11	18
No. missed trips	0	0	0	0	0	0
Freq/PAX (0-4)	167	172	140	158	163	141
Freq/PAX (5-10)	19	25	21	27	20	27
Freq/PAX (11-15)	10	6	15	6	9	9
Freq/PAX (16-20)	19	15	13	24	16	13
Freq/PAX (21+)	19	26	23	21	19	32
Nutrition Transprt						
No. site trips	2710	2937	2700	3565	3044	3405
No. shopping trps	164	169	140	179	152	147
No. home del. trps	67	89	44	84	82	56
No. other trips	6	14	3	4	3	4
No. of no shows	9	7	11	11	16	8
VEHICLE STATISTICS						
Total miles:						
d-r Health	11463	11871	11094	13320	9631	13966
nutri sites	5150	5985	6717	6678	5333	6328
food del (HOH)	5360	5160	2653	6670	5776	6268
Total vehicle hrs:						
d-r Health	610	596	833	662	560	740
nutri sites	427	464	410	493	442	396
food del (HOH)	250	273	247	368	250	242
PERFORM. MEASURES						
AV. Mi/veh/day:						
d-r Health						
nutri sites						
food del (HOH)						
PAX/veh hr:						
d-r Health	2.52	2.78	1.79	2.51	2.54	2.52
nutri sites	6.35	6.33	6.59	7.23	6.89	8.60
CONSOL. HST STATS.						
Total HST PAX(und)	431	462	387	426	422	402
Total HST TRPS	4482	4863	4377	5493	4706	5477
HST PAX/HST V HRS	4.32	4.59	3.52	4.76	4.70	4.82

TABLE 5. CALL-A-RIDE PRODUCTIVITY

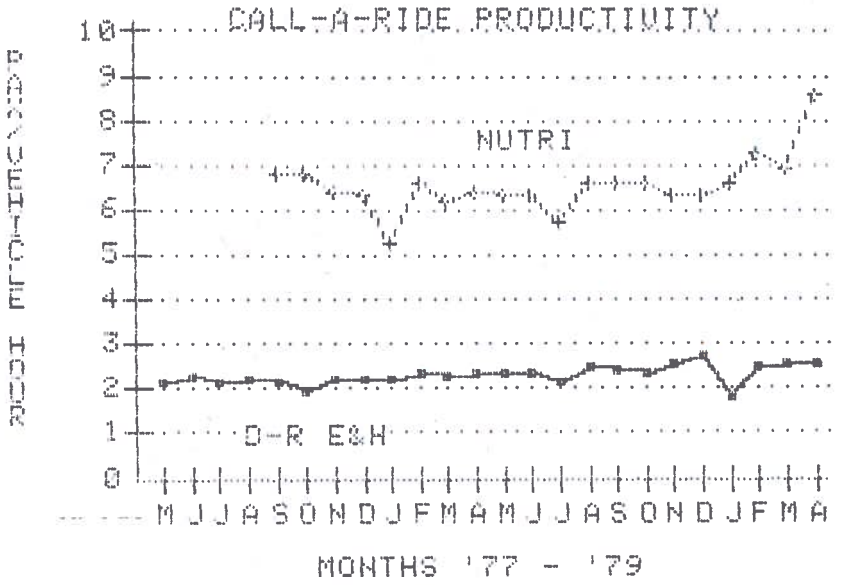
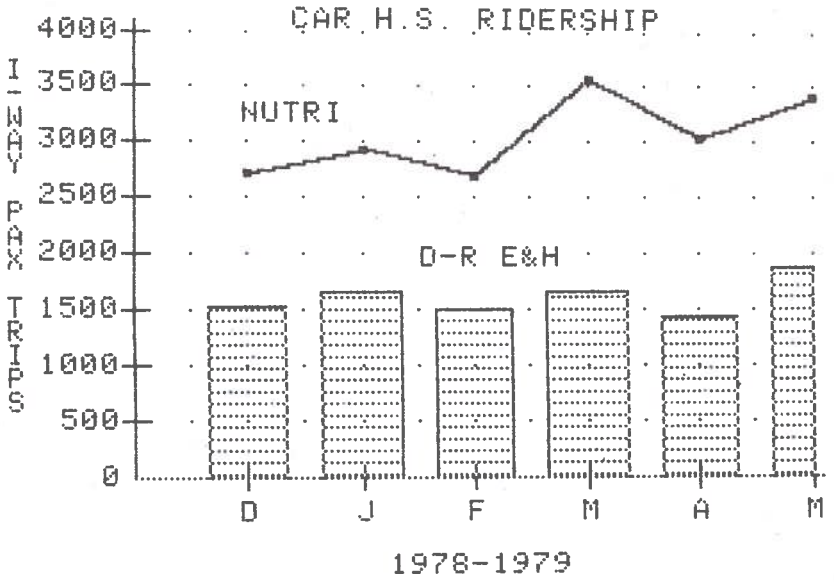


TABLE 6. CAR H.S. RIDERSHIP



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