

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



PHYSICAL RESEARCH REPORT NO. 47

SUMMARY ANALYSIS:
"BEFORE" STUDY DATA COLLECTION
FOR THE I-80 MOTORIST AID
COMMUNICATION SYSTEM
(IHR - 002)



— SPRINGFIELD, ILLINOIS 62764 —

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16. Abstract <p>The Illinois Department of Transportation has the responsibility of evaluating the I-80 Motorist Aid Communication System, which consists of 302 telephones along 138 miles of Interstate 80. The evaluation utilizes the "before-after" study technique which is a comparison of two similar sets of data collected "before" implementation of the system and "after" implementation of the system.</p> <p>Data for the "before" study were gathered from various sources. The Illinois State Police furnished Assistance Rendered Reports and Accident Reports. The Illinois Department of Transportation conducted Stopped-Vehicle Surveys and a Public Opinion Survey, and cooperating service units furnished information concerning disabled vehicles on I-80.</p> <p>This report documents a summary of part of the analysis performed on the "before" study data which were collected from September, 1969 to May, 1972. The statistical information should be applicable to similar rural freeway situations.</p>					
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SUMMARY ANALYSIS:
"BEFORE" STUDY DATA COLLECTION
FOR THE
I-80 MOTORIST AID COMMUNICATION SYSTEM

by
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Interim Report
IHR-002 - Motorist Aid System for Rural Freeways

Study Conducted in Cooperation With
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policy of the U. S. Department of Transportation. This report does not constitute a standard, specification or regulation.

March 1974

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Summary Analysis:
"Before" Study Data Collection
for the
I-80 MOTORIST AID COMMUNICATION SYSTEM

Introduction

An experimental motorist aid communication system was undertaken in Illinois to assist motorists having some form of difficulty while traveling on Interstate 80, and to determine the applicability of such systems on other rural freeways throughout the state and the nation.

The specific objectives of the experiment are: (1) to ascertain the needs for assistance of operators of motor vehicles; (2) to provide or coordinate the necessary services to satisfy those needs; (3) to remove hazards and restore safe traffic operations; and (4) to provide an adequate communication subsystem to perform all of the three above objectives.

Motorists traveling on a 138-mile portion of Interstate 80, between Joliet and Rock Island, have access to a communication network that includes 302 roadside terminals placed at the outside shoulder edges, spaced at one-mile intervals. The State-owned communication system is a two-way voice carrier, hard-wire, installation operated through the headquarters of the two Illinois State Police Districts in which the section lies. Toll-free calls from motorists requiring assistance are answered by the police desk sergeants, who then dispatch the necessary services or provide the required information. The system is designed to accommodate both emergency and non-emergency situations: that is, whatever aid the motorist seeks under the signing of "motorist aid."

The overall experimental project was planned in three general phases: (1) Definition and Design; (2) Implementation; and (3) Evaluation and Operations. With the completion of the aid system installation in early 1973, only the evaluation phase remains to be completed. The evaluation phase compares representative data sets collected "before" and "after" system implementation. The overall effectiveness of the system is being assessed through the conduct of various surveys and analyses, primarily from the following sources:

- Illinois State Police: Assistance Rendered Reports
- Service Unit: Assistance Rendered Reports
- Public Opinion Questionnaire Surveys
- Illinois State Police: Accident Reports
- Stopped-Vehicle Surveys

This interim report documents the statistical information generated primarily from the analysis of data representing the "before" system implementation condition on Interstate 80. The analysis should not be considered as complete, but can be used as interim information pending completion of the "after" evaluation phase and final report covering system effectiveness.

The "after" study data collection began with full system implementation in the Spring of 1973, and will continue for one complete year. The primary data collection sources for actual aid phone system usage are tape recordings of all conversations made. The data collection period is followed by system effectiveness evaluation, where "before" and "after" data will be compared, with the Final Report due by March 1975.

The significance of the "before" study conditions presented in this interim report is difficult to assess, since the entire evaluation is based on whether changes occur as a result of the aid phone network. However, the data do describe the characteristics found on Interstate 80, and should

be applicable to similar rural freeway situations.

For example, for the travel characteristics along 138 miles of I-80, non-accident police assists averaged 4.3 per day, with the report detailing assist situations, actions taken, assist times, and other statistics. The accident records indicate 2.1 accidents per day, with further breakdowns in the report. Various statistics, as reported by service units, such as service times, types, vehicles involved, and distances, are included, as well as public opinion responses to a questionnaire survey.

The two stopped-vehicle surveys demonstrated that 83 percent of all vehicles stopping along the freeway were stopped for short duration; 55 percent of the stoppages were for unknown or undetermined reasons; 96 percent either did not need service or were not observed as having received service. The report includes further statistical breakdowns, and provides comments on the future work anticipated in analyzing each data source, particularly relating to the potential impact of the aid phone system.

ILLINOIS STATE POLICE
ASSISTANCE RENDERED REPORTS

Background

The Illinois State Police cooperated in the "before" study by filling out a form (Figure 1, Appendix) each time an assist was made on Interstate 80. The information on the form can be correlated with other sources of data to get a better overall picture of the number of stops made on the route, the duration of each stop, and the reasons for the stops. Data were collected from August, 1969, to October, 1971, resulting in 3340 assist records.

Analysis

The data were analyzed with two objectives in mind. The first objective is to determine the average times associated with an assist rendered by the State Police (i.e., time that a motorist waited before detection by the police unit on patrol, and the time spent on the scene by the police). After determination of these times, the data can be used to estimate the level of service that the State Police provide in assisting motorists, compared with police assist times in the "after" study related to usage of the motorist aid telephones. The second objective is to determine the number and type of assists rendered by the State Police, compared to the number and type rendered during the "after" study. This also requires an analysis of patrol service levels for each comparison period.

Objective number one was satisfied by calculating the following times:

Average Motorist Waiting Period:	13,4 minutes
Average Police-on-Scene Time:	<u>22,3</u> "
Total Average Police Assist Time:	35,7 minutes

A sub-stratification of these data was performed to determine if the average times differed greatly by lighting and weather conditions.

	<u>Daylight</u>	<u>Darkness</u>
Average Motorist Waiting Period	12.8 min.	14.1 min.
Average Police-on-Scene Time	<u>22.0 "</u>	<u>22.0 "</u>
Total Average Police Assist Time	34.8 min.	36.1 min.
	<u>Dry</u>	<u>Rain/Snow</u>
Average Motorist Waiting Period	13.6 min.	12.4 min.
Average Police-on-Scene Time	<u>22.0 "</u>	<u>21.9 "</u>
Total Average Police Assist Time	35.6 min.	34.3 min.

The above calculations show that the service of the State Police did not vary greatly under different visibility and weather conditions.

Objective number two was determined by calculating the average number of reported assists rendered per day by the State Police. The number of days covered by the data set is 780. Therefore: $3,340 \text{ assists} / 780 \text{ days} = 4.3 \text{ assists/day}$.

The number of assists during the "winter" months, from November through March, covering 302 days, was 1430, giving 4.7 assists/day; during the "non-winter" months there were 4.0 assists/day. The seasonal difference implies that daily police assists are almost 20 percent higher in winter, despite substantially higher traffic volumes during the summer.

The reasons for the State Police assists and the actions taken to help the stranded motorists were analyzed for comparison with similar data to be collected in the "after" study. The 3340 assists by situations were as follows:

Tire/Wheel	797	(23.9%)
Direction/Information	556	(16.6%)
Cooling System	465	(13.9%)
Out of Gas	418	(12.5%)
Ignition Trouble	246	(7.4%)
Fuel Pump	100	(3.0%)
Deliver Message	6	(0.2%)
Illness/Injury	2	(0.1%)
Other	750	(22.4%)

The actions taken by the State Police were as follows:

Provide Transportation	979	(29.3%)
Call Tow Truck	785	(23.5%)
Assist in Tire Change	373	(11.2%)
Assist with Repair	273	(8.2%)
Transfer Fuel	51	(1.5%)
Other (Info, Direc, etc.)	879	(26.3%)

Future Work

With the motorist aid telephone system in operation, one aspect of the evaluation will determine whether police assists decreased. Many calls, such as requests for direction or information, have potential to reduce patrol assists, since the assist can be handled by the state trooper at the motorist aid telephone operating console.

The Illinois State Police will supply the same information during the "after" study. Similar summaries will be made with the "after" study data and comparisons will be made with the "before" study data to determine the effect of the aid phone system on police assists.

SERVICE UNIT
ASSISTANCE RENDERED REPORTS

Background

The system of motorist aid on Interstate 80 before the installation of motorist aid telephones consisted of state police patrols, assists by passing motorists and "off-the-road detection," such as calls from farmhouses along the roadside. Regardless of how a motorist with a disabled vehicle is detected, a service vehicle is usually required to supply the needed help. The total delay that a disabled motorist experiences is one of the measures that can be used to determine whether or not one system of aid is better than another.

A total of 154 service units, consisting of service stations, wreckers, fire departments, police departments and ambulance units, were contacted with a request to provide details of any service calls made on Interstate 80. These service units were selected as the most probable units by location to serve I-80. Of the 154 units contacted, only 76 responded favorably to the request. These 76 units were supplied with Service Unit-Assistance Rendered Report forms (Figure 2, Appendix), which contained questions about each assist.

Analysis

From December, 1969, to May, 1972, a total of 521 forms were returned. The forms were coded, keypunched, verified and corrected, and a computerized listing was compared to computerized listings of the public opinion questionnaires and the Illinois State Police Assistance Rendered Reports to correlate the assists and fill in some gaps in the data.

Means were calculated for applicable service times and distances as follows: All data were not always recorded for all 521 reported service assists; therefore, all averages shown are for variable sample sizes less than 521.

<u>Vehicle Type</u>	<u>Assists</u>	<u>Average Time on Scene (Minutes)</u>
Passenger Cars	304 (58.3%)	19.4
Combination Unit Truck	64 (12.3%)	38.8
Station Wagon	48 (9.2%)	19.7
Tractor (no trailer)	20 (3.8%)	54.8
Single Unit Truck	17 (3.3%)	36.6
Pickup/Panel Truck	15 (2.9%)	25.4
Bus	5 (1.0%)	34.0
Motorcycle	1 (0.2%)	3.0
Other	7 (1.3%)	18.3
Not Recorded	40 (7.7%)	18.3
Total	521 (100.0%)	23.4

<u>Service Type</u>	<u>Assists</u>	<u>Average (minutes)</u>			
		<u>Time to Scene</u>	<u>Time on Scene</u>	<u>*Time to Aid Center and/or Base</u>	<u>Total Aid Time</u>
Tow Disabled Vehicle	306 (58.8%)	22.9	23.9	31.8	72.0
Service Vehicle on Scene	169 (32.4%)	20.5	24.5	17.7	64.6
Ambulance Response	24 (4.6%)	12.5	8.9	27.6	48.6
Fire Unit Response	22 (4.2%)	9.1	24.5	15.5	43.4
Total	521 (100.0%)	20.9	23.4	27.7	68.3

<u>Service Distance</u>	<u>Mean</u>
Mileage from Base to Scene	6.3 miles
Mileage to Aid Center and/or Base of Operation*	7.9 miles

(*These average figures include trips from the scene of the assist, to the aid center, then back to the base of operation, and also trips from the assist scene directly to the base of operation. Repair times at an aid center or base are not included for towed vehicles.)

Future Work

Work to be done on the service unit data includes stratifying the data according to weather conditions, performing an analysis of variance on all stratified data, calculating frequency distributions for the response times, and plotting regression lines for the distance versus time parameters. The means, standard deviations, regression slopes and correlation coefficients will be compared with the same parameters in the "after" study set. Comparisons will also be made of the composition of the traffic stream versus the composition of vehicles requiring service.

PUBLIC OPINION SURVEY SUMMARY

Background

A public opinion survey was made to determine the motorist attitude toward the pre-phone system of aid on Interstate Route 80. Survey questionnaires (Figure 3, Appendix) were distributed by the Illinois State Police to motorists who received assistance or had some contact with the police that required a stop along the side of the road. Survey questionnaires were also sent to motorists whose vehicles were spotted along the roadside during a stopped-vehicle survey in March of 1970. License plate information was used to find the owner of the vehicle for those questionnaires that were mailed. Approximately 1700 questionnaires were distributed over a period of 30 months, with 231 returned. (The questionnaires were coded, keypunched, listed, corrected and analyzed.)

Analysis

Of the 231 questionnaires returned, only 198 stated that aid was required. Of the remaining 33 questionnaires, only 3 failed to state whether aid was needed or not. A breakdown by vehicle type for all returned questionnaires gave the following results:

Passenger Car	188	(81.4%)
Pickup/Panel	17	(7.4%)
Motorcycle	10	(4.3%)
Bus	6	(2.5%)
Tractor-Trailer	2	(0.9%)
Single Unit Truck	2	(0.9%)
Other	4	(1.7%)
Not Recorded	<u>2</u>	<u>(0.9%)</u>
Total:	231	(100,0%)

The 231 returned questionnaires were broken down by the state in which the vehicle was registered. The following results were obtained:

Illinois	138	(59.8%)
Iowa	15	(6.5%)
Michigan	10	(4.3%)
Indiana	10	(4.3%)
Wisconsin	5	(2.2%)
19 other states	43	(18.6%)
Not Recorded	10	(4.3%)

Of the 231 questionnaires, 216 stated they stopped on the right shoulder, 7 on the left shoulder, 3 in the traffic lanes and 5 questionnaires had no record of the position of the stop.

The reason for stopping was broken down with the following results:

Mechanical	81	(35.1%)
Tire/Wheel	68	(29.4%)
Gas or Oil	39	(16.9%)
Electrical	8	(3.5%)
Accident	3	(1.3%)
Other	31	(13.4%)
Not Recorded	1	(0.4%)

In addition to the above information, the questionnaire contained 13 questions which were aimed at determining the motorist viewpoint concerning the system of aid which was used to help them and also their preference for any other aid system. The breakdown of each question follows:

Question No. 1 (1st of 2 parts) Did you need assistance?

Yes	198	(85.7%)
No	30	(13.0%)
No Response	3	(1.3%)

(2nd part) Did you get assistance?

Yes	201	(87.0%)
No	13	(5.6%)
No Response	17	(7.4%)

Question No. 2 How would (did) you try to summon help?

Signals on Vehicle	84	(36.3%)
Police	52	(22.5%)
No Opinion	23	(10.0%)
Walk to Service	20	(8.7%)
Passing Vehicle	19	(8.2%)
Other	15	(6.5%)
No Response	18	(7.8%)

Question No. 3 Were you (or would you be) hesitant to leave your vehicle?

Yes	143	(61.9%)
No	80	(34.6%)
No Response	8	(3.5%)

Question No. 4 How long did you have to wait for assistance? (in minutes)

1-10	78	(33.8%)
11-20	37	(16.0%)
21-30	22	(9.5%)
31-45	19	(8.2%)
46-60	11	(4.8%)
Over 60	15	(6.5%)
No Response	49	(21.2%)

Question No. 5 (1st of 2 parts) Were you unduly delayed in being detected?

Yes	34	(14.7%)
No	176	(76.2%)
No Response	21	(9.1%)

(2nd part) Were you unduly delayed in receiving service?

Yes	28	(12.1%)
No	162	(70.1%)
No Response	41	(17.8%)

Question No. 6 How long did you expect to wait for a police patrol to stop? (in minutes)

1-10	11	(4.8%)
11-20	34	(14.7%)
21-30	57	(24.7%)
31-45	3	(1.3%)
46-60	34	(14.7%)
Over 60	7	(3.0%)
No Response	85	(36.8%)

Question No. 7 Who provided you with assistance and/or service?

Police	118	(51.1%)
Service Truck	56	(24.2%)
No Aid Needed	27	(11.7%)
Passing Motorist	24	(10.4%)
Other	4	(1.7%)
No Response	2	(0.9%)

Question No. 8 Were you fairly charged for service?

Yes	135	(58.4%)
No	13	(5.6%)
No Response	83	(36.0%)

Question No. 9 Were the service personnel courteous and competent?

Yes	179	(77.5%)
No	6	(2.6%)
No Response	46	(19.9%)

Question No. 10 Would you like to see increased motorist aid systems, such as? (1 or more responses possible)

Free Aid Telephones	146	(63.2%)
Along Road		
Increased Police Patrol	76	(32.9%)
Pay Telephones Along	71	(30.7%)
Road		
Push Button Boxes Along	59	(25.5%)
Road		
Patrol by Public Trucks	41	(17.8%)
Existing System is Best	22	(9.5%)
Patrol by Private Trucks	17	(7.4%)
Other	7	(3.0%)
No Response	10	(4.3%)

Question No. 11 How far would you consider walking from a disabled vehicle to reach a roadside phone or call box?

0 ≤ 1/4 mile	13	(5.6%)
1/4 ≤ 1/2 mile	51	(22.1%)
1/2 ≤ 1 mile	86	(37.2%)
1 ≤ 2 miles	35	(15.2%)
> 2 miles	15	(6.5%)
No Response	31	(13.4%)

Question No. 12 How much would the convenience of a roadside phone or call box be worth to you in obtaining future service?

\$0.01 - 0.50	3 (1.3%)
0.51 - 1.00	11 (4.8%)
1.01 - 2.00	4 (1.7%)
2.01 - 4.00	3 (1.3%)
4.01 - 6.00	14 (6.1%)
"Very Much"	19 (8.2%)
No Response/Opinion	177 (76.6%)

Question No. 13 If you need help at the roadside, how long should you have to wait for service of the following type? (in minutes)

	<u>Ambulance</u>	<u>Fire Dept.</u>	<u>Service Truck</u>
1-15	130 (56.2%)	113 (48.9%)	29 (12.6%)
16-30	36 (15.6%)	34 (14.7%)	107 (46.3%)
31-45	2 (0.9%)	2 (0.9%)	9 (3.9%)
46-60	6 (2.6%)	6 (2.6%)	47 (20.3%)
Over 60	0 (0.0%)	0 (0.0%)	5 (2.2%)
No Response	57 (24.7%)	76 (32.9%)	34 (14.7%)

In addition to the above breakdown, the proportion of answers for each question out of the returned questionnaires was calculated and is listed below. This information will be used to develop confidence limits for each question when they are analyzed in more detail and compared with results of the public opinion survey in the "after" study.

	<u>Proportion of Answers for Each Question</u>
#1 (1st part)	98.7%
(2nd part)	92.6%
#2	92.2%
#3	96.5%
#4	78.8%
#5 (1st part)	90.9%
(2nd part)	82.2%
#6	63.2%
#7	99.1%
#8	64.0%
#9	80.1%
#10	95.7%
#11	86.6%
#12	23.4%
#13 (Ambulance)	75.3%
(Fire Dept.)	67.1%
(Service Truck)	85.3%

Using the data from Question 4, the average estimated time spent by motorists waiting for assistance was 27.9 minutes. The data from Question 6 were used to calculate the average time that motorists expected to wait for assistance as 38.3 minutes. Question 11 was used to determine that 1 mile was the average distance that a motorist would walk to reach an aid phone or call box, and Question 12 was used to calculate the average cost that a motorist was willing to pay for the use of an aid phone as \$4.81.

Sixty-one percent of all reported stops were made in daylight hours, 36 percent at night, with the remaining three percent not indicated. Sixty-three percent of the stops were made in clear weather, 24 percent in rain, six percent in snow or sleet, and seven percent not indicated.

Future Work

Comparisons will be made with similar public opinion data collected in the "after" study, and proportions will be calculated with other common measures to determine the effects of the new system. Consideration will be given to the adequacy of the sample, and its relationship to the composition of traffic.

INTERSTATE 80 ACCIDENT ANALYSIS

Background

The Illinois State Police furnished 2132 reports of accidents occurring on Interstate 80 from August 1, 1969, through May 31, 1972. These accident data were coded and keypunched and a listing was made on the computer. Included in the accident report data base was pertinent information about each accident (i.e., license numbers and types of vehicles involved and the service unit that cleared the roadway).

Analysis

Of the 2132 accidents recorded during the study period, 199, or 9.3 percent, were analyzed as having been caused by a previous incident. There was an average of 2.1 accidents per day for the entire 1035 days included in the "before" accident data base. The average property damage costs based on police report estimates, and a breakdown of accidents by severity type, were as follows:

	<u>Fatal</u>	<u>Injury</u>	<u>Damage Only</u>	<u>Total</u>
Number of Accidents	32	686	1414	2132
Average Property Damage	\$8865	\$3055	\$1034	\$1802

Future Work

The remaining analysis of the accident data includes a breakdown by weather and vehicle types, by accident severity rates and the composition of traffic, by location and cause of accidents related to other incidents, and by the proportion of accidents involving pedestrians. Analysis of variance methods will be used to determine whether there is a location, cause, and/or interaction effect on those accidents that were caused by a previous incident or accident.

The accident statistics and analyses, on a comparative "before" and

"after" basis will help determine whether the existence of motorist aid telephones contributes to more accidents, due to the increased exposure of pedestrians on the shoulder and exposure of the aid telephones themselves as obstacles, or fewer accidents due to decreased exposure time of disabled vehicles and motorists using the aid system,

STOPPED-VEHICLE SURVEY

Background

Two "before" stopped-vehicle surveys (SVS) were conducted on a 9-mile section of I-80 to determine the incidence of vehicles stopping along the freeway that required some assistance. One survey was conducted during the summer (September) of 1969 and another during the winter (March) of 1970, with each survey lasting continuously for seven consecutive days. Data were collected by observers in "floating" cars, continuously circulating on the study section at about 6-minute headways (section coverage averaging 3-minute intervals). The observers recorded information concerning any stopped vehicles on audio tapes, which were later transcribed and edited to produce a completed coding form for each observed stopped vehicle.

During the September SVS, 952,384 vehicle-miles of travel were monitored; in the March SVS, 696,256. Traffic stream classification counts recorded 62 percent passenger cars in September and 69 percent in March, most of the remaining vehicles having been classed as various truck types. In September, 89 percent of the study was conducted in fair weather, with 8 percent as rain and 3 percent fog. In March, 87 percent of the time was fair, with the remaining 13 percent as snow flurries.

Analysis

The following stopped-vehicle information was obtained from the two surveys:

	<u>September</u>	<u>March</u>
Total number of stopped vehicles observed	857	438
Number of stopped police vehicles in sample	44	35
Number of highway department vehicles in sample	17	9
Number of vehicle-miles per stopped vehicle	1,111	1,590

	<u>September</u>	<u>March</u>
Directional distribution:		
Westbound	509 (59.4%)	237 (54.1%)
Eastbound	318 (37.1%)	178 (40.6%)
Unrecorded	30 (3.5%)	23 (5.3%)

Daily distribution:		
Monday	130 (15.2%)	75 (17.1%)
Tuesday	123 (14.4%)	51 (11.7%)
Wednesday	101 (11.8%)	58 (13.2%)
Thursday	97 (11.2%)	63 (14.4%)
Friday	132 (15.4%)	61 (13.9%)
Saturday	137 (16.0%)	53 (12.1%)
Sunday	137 (16.0%)	77 (17.6%)

Hour in which vehicle stopped:

12 MIDNIGHT up to 1 AM	34 (4.0%)	13 (3.0%)
1 AM up to 2 AM	27 (3.2%)	5 (1.1%)
2 " 3	26 (3.0%)	9 (2.1%)
3 " 4	16 (1.9%)	15 (3.4%)
4 " 5	20 (2.3%)	8 (1.8%)
5 " 6	20 (2.3%)	11 (2.5%)
6 " 7	42 (4.9%)	18 (4.1%)
7 " 8	34 (4.0%)	9 (2.1%)
8 " 9	43 (5.0%)	16 (3.6%)
9 " 10	52 (6.1%)	22 (5.0%)
10 " 11	50 (5.8%)	30 (6.9%)
11 " 12 NOON	42 (4.9%)	30 (6.9%)
12 NOON up to 1 PM	51 (6.0%)	17 (3.9%)
1 PM up to 2 PM	53 (6.2%)	23 (5.2%)
2 " 3	48 (5.6%)	35 (8.0%)
3 " 4	51 (6.0%)	18 (4.1%)
4 " 5	37 (4.3%)	33 (7.5%)
5 " 6	32 (3.7%)	24 (5.5%)
6 " 7	28 (3.3%)	34 (7.8%)
7 " 8	37 (4.3%)	18 (4.1%)
8 " 9	32 (3.7%)	19 (4.3%)
9 " 10	44 (5.1%)	13 (3.0%)
10 " 11	20 (2.3%)	13 (3.0%)
11 PM up to 12 MIDNIGHT	18 (2.1%)	5 (1.1%)

Vehicle type distribution:

Passenger Car/Station Wagon	512 (59.7%)	226 (51.6%)
Combination Truck	220 (25.7%)	131 (29.9%)
Single Unit Truck	103 (12.0%)	66 (15.1%)
Motorcycle	9 (1.1%)	5 (1.1%)
Bus	2 (0.2%)	3 (0.7%)
Unrecorded	11 (1.3%)	7 (1.6%)

	<u>September</u>	<u>March</u>
Apparent reason for Stop:		
Police Action	55 (6.4%)	40 (9.1%)
Tire/Wheel	50 (5.8%)	42 (9.6%)
Change Drivers	40 (4.7%)	11 (2.5%)
Assist Others	36 (4.2%)	34 (7.8%)
Adjust cargo	36 (4.2%)	17 (3.9%)
Mechanical	34 (4.0%)	9 (2.1%)
Consult Map	25 (2.9%)	9 (2.1%)
Road Maintenance	17 (2.0%)	9 (2.1%)
Sleep	17 (2.0%)	8 (1.8%)
Gas/Oil/Water	7 (0.8%)	1 (0.2%)
Toilet Stop	6 (0.7%)	2 (0.5%)
Hitchhiker	4 (0.5%)	0 (0.0%)
Accident	2 (0.2%)	0 (0.0%)
Illness	1 (0.1%)	1 (0.2%)
Motor/Engine	0 (0.0%)	10 (2.3%)
U-Turn	0 (0.0%)	4 (0.9%)
Fire	0 (0.0%)	0 (0.0%)
Unknown (See Note A)	496 (57.9%)	218 (49.7%)
Other	31 (3.6%)	23 (5.3%)

Minimum Durations of Stops: (see Note B)
(Maximum Intervals between observations)

0 to 10 minutes		
Observed only once	536 (62.5%)	292 (66.7%)
Observed more than once	173 (20.2%)	76 (17.4%)
11 to 20 minutes	48 (5.6%)	20 (4.6%)
21 to 30 "	25 (2.9%)	11 (2.5%)
31 to 40 "	12 (1.4%)	11 (2.5%)
41 to 50 "	5 (0.6%)	5 (1.1%)
51 to 60 "	7 (0.8%)	2 (0.5%)
61 to 110 "	22 (2.6%)	10 (2.3%)
111 minutes or more	29 (3.4%)	11 (2.5%)

Note A: Since most stopped vehicle were of short duration, most having been observed only once, the apparent reasons for stoppages, and services provided, if any, in these cases were difficult, if not impossible, to determine. Thus, short stoppages for unknown reasons, as well as for some apparent reasons, could be expected to be mostly of the "self-servicing" type.

Note B: The actual durations of stops, based on observations made from "floating" vehicles providing coverage averaging three-minute intervals, can be estimated as three minutes longer than minimum durations of stops (as determined from the maximum intervals between observations).

	<u>September</u>	<u>March</u>
Observed services received:		
State Police	12 (1.4%)	3 (0.6%)
Vehicle Towed	7 (0.8%)	11 (2.5%)
Service Truck	7 (0.8%)	9 (2.1%)
Passing Motorist	4 (0.5%)	0 (0.0%)
Fire Department	0 (0.0%)	0 (0.0%)
Ambulance	0 (0.0%)	0 (0.0%)
Unknown or None Needed (See Note A, preceding page)	827 (96.5%)	415 (94.8%)

Future Work

A similar analysis will be performed on data collected from an "after" stopped-vehicle survey. Comparisons will be made between the "before" and "after" data sets to determine whether the aid phones influence stopped-vehicle characteristics. All survey sample distributions will be related to the overall traffic stream distributions where applicable.

APPENDIX

FIGURE 1

Illinois State Police
Assistance Rendered Report Form

ILLINOIS STATE POLICE Assistance Rendered Report				1-80
Mile Post	Ramp 1. EE _____ 2. EL _____	Date	I. D. No.	Radio No.
	3. WE _____ 4. WL _____			
Motorist Waiting Period		Arrival Time	Completed Time	
Vehicle Registration No.		State	Vehicle Abandoned 1. Yes _____ 2. No. _____	
Situation: 1. Out of Gas _____ 4. Ignition Trouble _____ 7. Deliver Message _____ 2. Fuel Pump _____ 5. Cooling System _____ 8. Illness/Injury _____ 3. Tire/Wheel _____ 6. Direction/Info _____ 9. Other _____ (Describe)				
Action Taken: 1. Call Tow Truck _____ 4. Assist In Tire Change _____ 2. Transfer Fuel _____ 5. Assist With Repair _____ 3. Provide Transportation _____ 6. Other _____				
Person Left Vehicle:			No. of Persons In Vehicle	
1. Walked _____ 3. Unknown _____				
2. Rode _____				

FIGURE 2

Service Unit
Assistance Rendered Report Form

SERVICE UNIT - ASSISTANCE RENDERED REPORT I-80 MOTORIST AID STUDY		
NAME OF YOUR SERVICE UNIT _____		
DATE SERVICE WAS PROVIDED ON I-80 _____		
CALL REQUESTING YOUR SERVICE RECEIVED FROM: <input type="checkbox"/> State Police <input type="checkbox"/> Other _____		
LOCATION OF ROADSIDE SCENE _____ BY MILEPOST (be as specific as possible)		
MOTORIST'S VEHICLE IDENTIFICATION: (If known)		
Make _____	Color _____ Year _____	
State _____	License No. _____	
Type _____	Owner or Driver's Name _____	
TIME:		
Of receiving call requesting your service _____ am, pm		
Of arrival on I-80 scene _____ am, pm		
Of leaving I-80 scene _____ am, pm		
Of arrival at aid center (hospital, garage, etc.) if applicable _____ am, pm		
Of leaving aid center, if applicable _____ am, pm		
Of arrival at your base of operation _____ am, pm		
DISTANCE:		
From your base of operation to I-80 scene _____ miles		
From I-80 scene to aid center (if applicable) _____ miles		
From aid center to your base of operation _____ miles		
TYPE OF SERVICE YOU PROVIDED: (check those applicable)		
<input type="checkbox"/> Ambulance	<input type="checkbox"/> Extinguish Fire	<input type="checkbox"/> Assist with Repair of _____
<input type="checkbox"/> Fuel	<input type="checkbox"/> Towed to _____	
<input type="checkbox"/> Mechanical	<input type="checkbox"/> Assist in tire change	<input type="checkbox"/> Other _____
AMBULANCE AND/OR MEDICAL AID:		
Accident? _____ Other _____		
No. requiring first aid only _____	No. of Fatalities _____	
No. requiring hospitalization _____	Where taken _____	
SEND MORE CARDS _____ YES _____ NO		

FIGURE 3

Public Opinion Questionnaire Form

DATE _____ TIME _____ LOCATION _____	INTERSTATE ROUTE 80 MOTORIST AID QUESTIONNAIRE Your answers to the following questions will provide the Illinois Division of Highways with information on the travel needs of motorists on rural freeways. Please complete this card in relation to your vehicle stopping on Interstate Route 80 and mail it - postage free. Thank you for your cooperation.
VEHICLE TYPE: <input type="checkbox"/> Car <input type="checkbox"/> Bus or Taxi <input type="checkbox"/> Pickup or Panel Truck <input type="checkbox"/> Single Unit Truck <input type="checkbox"/> Tractor-Trailer or Semi-Trailer Truck <input type="checkbox"/> Other _____	1. DID YOU NEED ASSISTANCE? ___Yes___ No DID YOU GET ASSISTANCE? ___Yes___ No
STATE AND VEHICLE LICENSE NUMBER _____	2. HOW WOULD (DID) YOU TRY TO SUMMON HELP? ___Signals on vehicle; ___Walk to Service: ___Passing Vehicle; ___Police; ___Don't know; ___Other _____
POSITION OF VEHICLE: (when stopped) <input type="checkbox"/> Right Shoulder <input type="checkbox"/> Left Shoulder <input type="checkbox"/> In Traffic Lanes	3. WERE YOU (OR WOULD YOU BE) HESITANT TO LEAVE YOUR VEHICLE? ___Yes___ No
REASON FOR STOP: <input type="checkbox"/> Gas or Oil <input type="checkbox"/> Tire <input type="checkbox"/> Mechanical <input type="checkbox"/> Electrical <input type="checkbox"/> Accident <input type="checkbox"/> Other _____	4. HOW LONG DID YOU HAVE TO WAIT FOR ASSISTANCE? _____
	5. WERE YOU UNDULY DELAYED IN BEING DETECTED ___Yes___ No OR RECEIVING SERVICE? ___Yes___ No
	6. HOW LONG DID YOU EXPECT TO WAIT FOR A POLICE PATROL TO STOP? _____
	7. WHO PROVIDED YOU WITH ASSISTANCE AND/OR SERVICE? _____
	8. WERE YOU FAIRLY CHARGED FOR SERVICE? ___Yes___ No
	9. WERE THE SERVICE PERSONNEL COURTEOUS AND COMPETENT? ___Yes___ No
	10. WOULD YOU LIKE TO SEE INCREASED MOTORIST AID SYSTEMS, SUCH AS: <input type="checkbox"/> Increased police patrol <input type="checkbox"/> Patrol by public owned service trucks <input type="checkbox"/> Patrol by private service trucks <input type="checkbox"/> Pay telephones along road <input type="checkbox"/> Free aid-telephones along road <input type="checkbox"/> Existing system is best <input type="checkbox"/> Push button signal boxes along road <input type="checkbox"/> Other _____
	11. HOW FAR WOULD YOU CONSIDER WALKING FROM A DISABLED VEHICLE TO REACH A ROADSIDE PHONE OR CALL BOX? _____
	12. HOW MUCH WOULD THE CONVENIENCE OF A ROADSIDE PHONE OR CALL BOX BE WORTH TO YOU IN OBTAINING FUTURE SERVICE? \$ _____ <input type="checkbox"/> No opinion
	13. IF YOU NEED HELP AT THE ROADSIDE, HOW LONG SHOULD YOU HAVE TO WAIT FOR SERVICE OF THE FOLLOWING TYPE? Ambulance _____ Fire Dept. _____ Service Truck _____