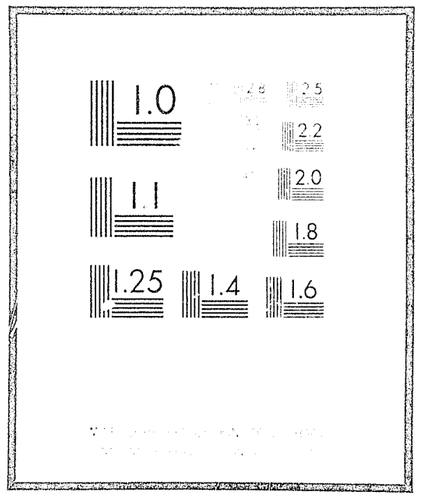

ATLANTA HIGH IMPACT PROGRAM
PROJECT EVALUATION
JANUARY 1, 1974 - DECEMBER 31, 1975

FINAL REPORT

EXPANSION OF HELICOPTER PATROL

73-DF-04-0023

PREPARED BY

ATLANTA CRIME ANALYSIS TEAM

AUGUST, 1976

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INTRODUCTION

This report represents the final evaluation of the Atlanta Helicopter Expansion Project, grant number 73-DF-04-0023. The primary purpose of this report is to provide a comprehensive documentation and analysis of the project's operations during the time period of January 1, 1974 through December 31, 1975.

In order to accomplish the evaluation task, the Crime Analysis Team has incorporated two evaluation perspectives. As the primary evaluation mechanism, the evaluation structure adheres to the prescribed grant evaluation component. In this respect, an objective interpretation of the data elements is provided within the parameters of the project goal and objectives. As a secondary alternative, the report provides a subjective interpretation of the project's results and effectiveness. For this purpose, the evaluation staff, through a personnel inquiry technique, relied upon structured feedback from the primary recipients of the helicopter's services, the field patrol officer. In addition, the report identifies other law enforcement activities and projects that assist in clarifying and delineating the extent and magnitude of the helicopter project's impact. The final assessment of Atlanta's application of police helicopter patrol is rendered after considering the results of both evaluation approaches.

SUMMARY OF FINDINGS

PROJECT GOAL

The designated project goal of a 15% reduction for residential burglary, commercial burglary, and robbery was not achieved. There was, however, an absolute reduction for residential burglary and robbery from the 1973 base year compared to the final year of helicopter project activity. When 1973 base line data is compared to the 1975 data, residential burglary decreased by 10.9%, robbery decreased by 3.8% and commercial burglary increased by 5%. As indicated in the body of the report, however, available data and information prohibits attributing the crime decrease solely to the helicopter program. (Refer to section Integrated Analysis: Inference/Explanation)

PROJECT OBJECTIVES

Objective 1 required that the ratio of target crime to non-target crime responses be no less than .6. For the project period, the applicable ratio was .467. The specified ratio of .5 was, however, achieved in the fourth, fifth, and eighth periods, .520, .500, and .522 respectively.

Objective 2 required that the success rate and area success rate increase by 20 percent during the project period. This objective was achieved with the success rate increasing from 4.7 to 6.0 and the area success rate increasing from 4.0 to 12.1 by the termination of the helicopter program.

Objective 3 required that the helicopter units provide aerial support at the rate of 60 hours of aerial patrol per day. For the project period, 44.7% of scheduled flight time was achieved. The low performance rating for this objective is partially attributable to the crash of two aircraft, one on June 19, 1975, and the second on July 24, 1975.

Objective 4 required a 20% increase in favorable, or positive, responses in regards to a public helicopter survey. Due to administrative constraints, a base survey was not established. The survey which was conducted indicated that 74% of those surveyed believed that the use of helicopters would assist police in doing a better job and 55% indicated that the police helicopter patrol provided an additional sense of security.

In addition to the specific goal and objectives, the following activities were conducted by the helicopter program.

FLIGHT HOURS

For the project period, the helicopter air units logged a total of 16,472.2 flight hours. Of this total, 11,196.5 hours were flown during the first project year, while 5,275.7 hours were logged for the second project year.

RESPONSES

For the two-year period, the project aircraft responded to a total of 24,996 calls. Of this total, 11,664 were target crime calls, while 13,332 were non-target crime calls.

ARRESTS

For the project period, the helicopter units assisted in a total of 1782 arrests of which 471 were for target offenders.

VEHICLE PATROL

Incidential to helicopter flight patrol, project personnel conducted ground patrol when either adverse weather conditions or maintenance problems persisted. During the grant period, project personnel in patrol units accomplished 1,397 arrests of which 155 were for target ofenses.

INTEGRATED ANALYSIS

An indepth correlation analysis has failed to prove that a correlation exists between helicopter flight hours and the number of burglaries and robberies reduced during the project period.

PATROL SURVEY

As an alternative evaluation approach, a patrol personnel survey was administered with specific questions pertaining to the helicopter project. Two of the questions generate specific support for the project. Of 176 responses to the question, "Do you think that the helicopter makes your patrol more effective?", 153 respondants, or 84.4% answered affirmatively, with 12 respondants, or 6.9% uncertain. The second question which was worded, "If the helicopter air unit assisted in the arrest, do you think the arrest(s) could have been made without the helicopter's assistance?", 72, or 49.3% of the 146 respondants indicated that the arrests could not have been effected without the air unit's assistance; 60 respondants or 41.1% indicated that they were uncertain, and only 14 or 9.6% of the respondants answered affirmatively.

[illegible]MATION

In review of the project results, the project achieved the prescribed project goal or objectives in only one instance, the success rate and area success rate (Objective 2). The project goal of a 15% reduction for burglary and robbery was not achieved although a significant percentage reduction was noted. The crime reduction cannot, however, be specifically attributed to the helicopter program. The patrol personnel survey, does however, indicate that the use of police aerial patrol represents a great advantage to the beat patrol officer. In its primary use as a support function, the aerial patrol enhances the effectiveness of the ground units. The rapid response of the aircraft to the crime scene as well as the increased observation capabilities appears to definitely

effect more criminal apprehensions. In addition, the presence of an air unit provides the patrol officer with an increased sense of security.

PROJECT DESCRIPTION

The concept of helicopter patrol for law enforcement operations first emerged in Atlanta in 1969. The utilization of helicopter patrol was perceived as an alternative whereby the effectiveness of police operations and more specifically police patrol operations could be increased without substantially expanding manpower requirements. This assumption was predicated upon the two superior operating characteristics of the helicopter air craft -- rapid response to calls and greater observation capabilities. In fact, Atlanta's first helicopter grant proposal (September 23, 1969) was entitled "Omnipresence" with an accompanying explanation that the application of police helicopter patrol was limited only by the imagination of the law enforcement agency.

The City of Atlanta received its first two police helicopters in May and June 1971. During the first year of operations, the two helicopter units logged a total of 2,348 flight hours and assisted field patrol units in 2,404 police incidences. As a direct result of their activities, the air units were credited with a total of 511 criminal arrests of which 166 were felony cases.

Even with the apparent success of the helicopter patrol, logistical limitations were realized that restricted the total effectiveness of a helicopter program. A serious limiting factor concerned the extent of the geographical service area in comparison to the patrol capabilities of the two air units. According to the LEAA sponsored publication "Sky Knight Project Report", the effective patrol area for a single helicopter unit is thirty five (35) square miles. As a means of comparison the two Atlanta police helicopters were responsible for 129 square miles or approximately twice the maximum recommended effective patrol area. In addition to the

geographical constraints, the project resources i.e. two air units and three flight crews prohibited a flight schedule whereby continuous helicopter services could be provided for each watch. If the level of flight activity for the twelve month project period is reduced to a daily average, the actual level of flight time is determined to equal an average of 6.5 hours per a day. This level of activity is not sufficient to imply that the helicopter program was supplementing or substantially complementing other police efforts. In retrospect however, the initial application of Atlanta's helicopter patrol, with consideration for the problem areas and constraints, did affirm the credibility and utility of the police helicopter concept.

In order to fully implement the helicopter concept into the everyday activities of the Atlanta Bureau of Police Services, a grant application was submitted which would provide four additional air units. The intended full compliment of six air units was considered the minimum requirement whereby continuous helicopter support would be available to all geographic areas while simultaneously maintaining the necessary compliance with FAA mandatory maintenance checks. In addition, the grant proposal expanded the original staff of one sergeant and six police officers to one lieutenant, five sergeants, and thirty six police officers (18 pilots and 18 observers). The total projected resources were considered adequate to provide helicopter services in each patrol district (four) for five hours of each eight hour shift.

In June, 1973, the City of Atlanta received LEAA impact funding for the helicopter expansion project. The grant award provided $1,504,461 in federal assistance with a total 26 month operating budget of $2,016,298. The project, however, did not become fully operational until the latter part of December, 1973; the interim period being utilized for the administrative

tasks of equipment procurement, personnel selection, and training. Due to the start-up time requirements, the original grant period of June, 1973 through August, 1975 was eventually extended through December, 1975. In view of the adjusted grant period, the applicable evaluation period is established from January 1, 1974, the first full month of project operations, up to the termination date of December 31, 1975.

PROJECT EVALUATION

The previous evaluation reports for the Helicopter Expansion project have relied exclusively upon the designated evaluation component. (Refer to Appendix A for a copy of this evaluation component.) As an evaluation mechanism, the evaluation component has been instrumental in defining the project's activities and operating performance levels, however, the utility of this evaluation tool for measuring and defining the project's impact on the targeted crimes has diminished as changes occurred that were external to the operating entity. This change factor is particularly pertinent to the Atlanta Helicopter project in view of the project's duration (two years) and the implementation of other police projects that exhibit chronological, geographical, and target crime similarities. Therefore, the determination of the helicopter project's impact on the target crimes is, at best, estimated within certain defined limits.

In order to provide a meaningful comprehension of the helicopter project results, this final evaluation report provides two evaluation perspectives. First, the report provides an analysis of the project in adherence to the defined evaluation component. For this purpose, the applicable data elements are presented and analyzed for the project goal and each project objective. As a secondary procedure, the report recognizes and incorporate two important variable. In order to clarify and/or qualify the resultant analysis of the project goal and objectives, consideration is directed toward those external factors that tend to demonstrate an influence on the helicopter project evaluation criteria. In this perspective, attention is directed toward 1) major operational changes within the police agency, and 2) those police projects that exhibit similar target crime impact. The primary change include:

1) the design of a new beat structure in July of 1973; 2) the continuation of the Anti-Robbery project; and, 3) the implementation of the THOR program.

Of a necessary consequence, the evaluation report recognizes the significant supportive function of the helicopter project. As a method of determining the perceived level of service delivery, the evaluation staff designed and administered a survey form to obtain input from the primary recipient of the supportive service, the field patrol officer. And, even though the survey results are not explicitly quantifiable and are somewhat subjective in approach, the survey instrument provides a significant and vital level of interpretation in to the otherwise concrete, impartial findings of the associated project goal and objectives.

Project Goal

The original goal statement for the helicopter expansion project was established to achieve a 30 percent reduction in residential burglaries within the 24 month project period. After the first quarter of operations, however, it become evident that the goal statement would not provide an accurate assessment of the project's operations in regards to crime reduction efforts. This assumption is exemplified in that the helicopter project was providing 24 hour a day service, yet, residential burglaries were primarily a day time occurrence. Consequently, the project was not being credited for their activities toward other impact offenses which were occurring during the evening and morning shifts. Further, the actual grant proposal specified that the project's operations would be dedicated toward those crime incidences that were predominate during the particular watch. In the proposal, this fact was specifically defined as follows: day watch-residential burglary, evening watch-robbery, morning watch-commercial burglary. Therefore, in view of the circumstances the goal statement was revised to include commercial burglary and robbery.

The revised goal statement is to: Reduce residential and commercial burglary by 15 percent and reduce robberies by 15 percent within 24 months in those zones patrolled by the helicopter units.*

*Of the five police patrol zones, helicopter activity was restricted to zones 1-4. Zone 5 which includes the downtown area was excluded due to the physical obstruction of high rise buildings.

PERFORMANCE MEASURES

Let b_0 = number of residential and commercial burglaries during 1973 for zones 1-4

b_1 = number of residential and commercial burglaries during 1975 for zones 1-4

r_0 = number of robberies during 1973 for zones 1-4

r_1 = number of robberies during 1975 for zones 1-4

If $b_1 \leq .85b_0$, and $r_1 \leq .85r_0$,

then the project goal will be achieved.

TABLE 1

	BURGLARY			ROBBERY
	Commercial	Residential	Total	
1973	3644	10336	13980	2898
1974	4158	10614	14772	3118
1975	3662	9207	12869	2789

Table 1 contains the crime data by which to measure the project goals. The 1973 figures indicate the base line data while the 1975 figures provide the actual performance indicators. By inserting the crime data into the formula criteria, the following comparisons are provided.

BURGLARY

b_1 = 12869

b_0 = 11883 (.85 X 13980)

ROBBERY

r_1 = 2789

r_0 = 2463 (.85 X 2898)

Total burglary offenses and total robbery offenses for 1975 equals 12869 and 2789, respectively. In order to achieve the goal, burglary offenses for 1975 would be less than or equal to 11, 883 which equates to a 15 percent reduction of the 1973 base data (13,980), and robbery offenses for 1975 would be less than or equal to 2463 which equates to a 15 percent reduction of the 1973 base data (2898). Since 12869 is greater than 11,883 and 2789 is greater than 2463 the project goal was not achieved.

A review of the data elements indicates however, that there was an absolute reduction in both crime categories (robbery and burglary).

TABLE II

	BURGLARY			ROBBERY
	Commercial	Residential	Total	Total
1974	14.1	2.7	5.7	7.6
1975	.5	(10.9)	(7.9)	(3.8)

By utilizing the data in Table 1, Table II illustrates the percentage of increase or decrease for each target crime. The comparisons are made in reference to the 1973 baseline target crime data. In comparing the 1974 data to 1973 baseline data, each target crime category increased commercial burglary 14.1%, residential burglary 2.7%, total burglary 5.7%, and robbery 7.6%. In comparing the 1975 data to the 1974 base line data, the following decreases are noted--residential burglary 10.9%, total burglary. 7.9% and robbery 3.8%. For the period, commercial burglaries increased by .5 percent.

Project Objectives

Objective I

Objective I indicates the concentration of helicopter patrol activity on the target crime categories as opposed to other helicopter activity. The criteria for Objective I states that the ratio of target crime to non-target crime responses will be no less than .50.

Let c = Total number of crime calls responded to by helicopter

t = Total number of target crime calls responded to by helicopter

If $t \geq .5c$ the objective will be achieved

For the project period, the helicopter units responded to a total of 11,664 target crime calls while the total number of calls (target and non-target) responded to was 24,996. For the performance criteria, t equals 11,664, c equals 24,996 and .5 c equals 12,498. In application 11,664 is not greater than or equal to 12,498; therefore, the objective was not achieved.

Table III illustrates the ratio of target crime calls to total crime calls for each quarter of the project. Appendix B contains a complete list of the data elements for Objective I

TABLE III

Ratio of Target Crime Responses to Total Crime Responses

	1st Year								2nd Year								Total Project Period
	1	2	3	4	5	6	7	8	5	6	7	8					
Ratio	.406	.422	.476	.520	.500	.488	.374	.522	.500	.488	.374	.522	.478				.467
Target Crime	1593	1367	2305	2429	1779	1075	552	564	1779	1075	552	564	3970				11664
Non-Target Crime	2330	1876	2539	2246	1776	1127	922	516	1776	1127	922	516	4341				13332
Total	3923	3243	4844	4675	3555	220:	1474	1080	3555	220:	1474	1080	8311				24996

While the ratio of target crime calls to total crime calls for the project period was .467 as opposed to the minimum performance measure of .5, the objective was achieved in three of the project quarters. These quarters were the fourth, fifth, and eighth periods with the respective performance measures of .520, .500, and .522. With the exception of the seventh quarter (.374), this performance measure maintained a minimum level of .400.

Objective 2

The criteria for Objective 2 is segmented into two interrelated performance measures:

1. Success rate: The success rate is a percentage based on the number of target crime arrests where a helicopter unit participates versus the total number of actual target crime responses by the helicopters. For definitional purposes, the actual target crime responses equals the total target crime responses minus the total number of false responses to a target crime. The success rate measures the helicopters capabilities in assisting patrol in apprehending the criminal offenders for the target crimes. As a performance measure, the success rate is predicted to increase during the project period as the project personnel become more effective in performing their tasks.
2. Area success Rate: The area success rate is a percentage based on the target crime arrests by the uniform patrol officers versus the total number of actual target crimes reported. The actual target crimes reported is the total number of reported target crimes minus the number of unfounded target crimes. By using a base period prior to the expanded helicopter project period, the area success rate indicates the change in arrest rates between the base period and the helicopter project period. The inferential assumption is that the area success rate will increase during the project period as a result of the helicopter's support. In addition, the area success rate provides

a counterbalance effect on the helicopter success rate i.e. the success rate and the area success rate should illustrate within limits, a direct correlation.

The specific performance measure for the success rate and area success rate are:

Success rate: The success rate will be 20 percent greater for the second year of the project when compared to the success rate for the first year of project activity.

Area Success Rate: The area success rate will be 20 percent greater for the final year of project operations when compared to the area success rate for the base period.

Table IV contains the success rate and area success rate for each quarter of project operations; the respective rates have been included for the first year, second year, and total project periods. In addition, a six month base period (July-December, 1973) is illustrated for the area success rate. The helicopter success rate for the first year of project operations is 4.7 while for the second year, the success rate is 6.0. In order to successfully achieve the objective (20 percent increase), the success rate has to equal 5.64 (4.7 times 1.2 equals 5.64). Since the success rate for the final year (6.0) exceeds the established criteria (5.64), the objective was achieved.

For the area success rate, the base rate is established at 4.0 which is derived from the six month period preceding helicopter project implementation. As the established performance level, the area success rate must equal or exceed 4.8 which is a minimum increase of 20 percent (4.0 times 1.2 equals 4.8). The objective for the area success rate was achieved within the first year of project operations (6.2) and was exceptionally exceeded by the termination of the final year of project operations (12.1).

TABLE IV

	1973				1974				1975					
	June - Sept.	Oct. - Dec.	Six (6) month Average	One Year Average	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.	2nd Year Avg.	Project Average
Area Success Rate (%)	4.0	3.91	4.0	6.2	4.84	7.26	7.19	5.68	10.26	13.87	12.72	12.16	12.1	7.89
Success Rate (%)				4.7	5.5	5.4	4.9	3.8	7.4	5.6	5.7	2.7	6.0	5.2

As mentioned, it was assumed that the Success Rate and the Area Success Rate would display a causal relationship. However, a review of Table IV indicates that the Area Success Rate increased at a greater rate than the Success Rate. The only plausible reason for this factor is that the Bureau of Police Services redesignated the patrol beats in June of 1973. Without further research, it is assumed that the lower area success rate for the base period (June-December, 1973) was in part due to a readjustment of the patrol personnel. Appendix C contains the data elements for the Area Success Rate.

Objective 3

Objective 3 was established to measure the specific level of flight operations that was achieved by the helicopter project. The performance measure specified that aerial patrol would be provided to the patrol zones on a 24 hour a day, seven days a week basis. To achieve the objective, the helicopter project was required to provide aerial service for five hours of each eight hour shift in patrol zones 1 through 4 or a total of 60 flight hours per day (4 zones times 3 shifts times five hours equals 60 hours). A provision was included, however, which allowed for discounting flight time lost due to adverse weather conditions. The performance measure is computed as follows:

The achieved level of flight activity is a ratio of actual hours flown to the number of flight hours scheduled minus scheduled flight hours lost due to weather conditions. $\%\ \text{hours flown} = \frac{\text{Hours flown}}{\text{Total hours scheduled} - \text{Total hours lost to weather}}$

Table V illustrates the applicable average rates of flight activity for each quarter of helicopter operations. In addition, the flight rates are provided for the first year, second year, and total project periods. A review of Table V illustrates that the highest level of flight activity occurred during the fifth quarter with 69.3 percent of the scheduled flight time actually flown. The extremely low performance for the sixth, seventh, and eighth quarter can be partially attributed to the crash of two helicopter units which occurred on June 19, 1975 and July 24, 1975.

In order to compensate for the reduction of two aircraft, a revised table (Table VI) was developed which allows for the loss of scheduled hours. The adjustment for hours scheduled reflects a direct reduction for the flight hours of two units. Therefore, if four air units provide 60 hours of service, the reduced level of activity would require 30 hours of service per a day.

Table VI which provides a monthly comparison for the adjusted schedule should be compared to Table VII which is also illustrated using monthly data.

Prior to project implementation, it was assumed that the level of flight activity with allowance for weather conditions would equal 100 percent, in fact, however, the achieved level was less than half of the anticipated flight hours. For the two year project period, the actual level of flight activity was 44.7 percent of scheduled hours. For the project period, 43,800 flight hours were scheduled, 16,472.2 hours were actually flown, and 6,977.1 hours were lost due to weather conditions. The range of achieved flight activity spans from a high of 81.6 percent (March, 1974) to a low of 6.4 percent (October, 1975). The applicable percentage of hours flown for the first and second years are 61.7 percent and 28.3 percent respectively. Of the total 16,472.2 hours flown for the project period, 11,196.5 or approximately 68 percent were obtained during the first year.

In retrospect, the project's capabilities in achieving a high level of flight hours was subordinated to a continuing maintenance problem. For the project period, an average of 553.5 hours per month or approximately 30 percent of scheduled flight hours were lost to helicopter maintenance. For the first and second years, the average monthly flight hours lost to maintenance were 421.2 and 685.9 hours, respectively. For the final three quarters, a monthly average of 867.4 hours or 47 percent of scheduled flight time was diverted to maintenance.

TABLE V

	% Hours* Flown	Hours Scheduled	Hours Flown	Hours Lost Weather	Hours Lost Maintenance
1974					
Jan-Mar	68.7	1800	898.5	492.5	402.2
Apr-June	49.5	1820	809.1	185.1	741.9
July-Sept	65.4	1840	1014.8	288.3	285.8
Oct-Dec.	64.9	1840	1009.8	284.6	254.8
First Year TOTAL	61.7	21900	11196.5	3751.4	5054.2
1975					
Jan-Mar	69.3	1800	832.1	598.9	141.3
Apr-June	30.7	1820	490.9	219.4	814.3
July-Sept	13.4	1840	232.6	103.5	1017.6
Oct-Dec.	12.1	1840	204.2	153.4	770.4
Second Year TOTAL	28.3	21900	5275.7	3225.7	8230.7
Project TOTAL	44.7	43800	16472.2	6977.1	13,284.9

TABLE VI

	% Hours* Flown	Hours Scheduled	Hours Flown	Hours Lost Weather	Hours Lost Maintenance
1975					
Jan.	66.9	1860	882.4	541.9	
Feb.	68.8	1680	830.6	473.3	
Mar.	72.6	1860	783.3	781.5	
Apr.	50.8	1800	766.6	292.1	
May	20.9	1860	430.9	256.3	
June	18.1	1635	275.3	109.8	
July	22.3	1290	270.9	77.5	
Aug.	30.6	930	256.5	91.5	
Sept.	22.5	900	170.5	141.5	
Oct.	14.2	930	109.6	157.2	
Nov.	31.8	900	243.1	134.4	
Dec	34.2	930	260	168.7	
One Year	39.5	16575	5275.7	3225.7	

*Please refer to page #21 for an explanation of this formula.

TABLE VII

	% Hours* Flown	Hours Scheduled	Hours Flown	Hours Lost Weather	Hours Lost Maintenance
1974					
Jan.	52.0	1860	593	719.6	507.8
Feb.	68.1	1680	849.7	432.7	400.5
Mar.	81.6	1860	1252.7	325.3	298.3
Apr.	50.0	1800	752.2	296.7	667
May	36.2	1860	638.6	93.7	1108.8
June	63.4	1800	1036.4	164.8	449.8
July	61.3	1860	1032.5	175.7	243.5
Aug.	63.6	1860	974.5	328.2	364.3
Sept.	72.1	1800	1037.5	361	249.7
Oct.	70.3	1860	1283.5	35.2	395.4
Nov.	64.8	1800	995.3	264.4	270.2
Dec.	57.5	1860	750.6	554.1	98.8
1975					
Jan.	66.9	1860	882.4	541.9	126.9
Feb.	68.8	1680	830.6	473.3	112.6
Mar.	72.6	1860	783.3	781.5	184.4
Apr.	50.8	1800	766.6	292.1	482.9
May	26.9	1860	430.9	256.3	973.3
June	16.3	1800	275.3	109.8	986.6
July	15.2	1860	270.9	77.5	1386.5
Aug.	14.5	1860	256.5	91.5	933.3
Sept.	10.3	1800	170.5	141.5	733
Oct.	6.4	1860	109.6	157.2	983.1
Nov.	14.6	1800	243.1	134.4	753.6
Dec.	15.4	1860	260	168.7	574.5
TOTAL	44.7	43800	16472.2	6977.1	13284.9

*Please refer to page #21 for an explanation of this formula.

Objective 4

Although the primary intent of the helicopter project was the detection and prevention of criminal activity, a secondary purpose was to provide an increased sense of security to the citizens of Atlanta. In order to measure this objective, it was proposed that two citizen attitude surveys be conducted - one survey prior to project implementation and a second survey after an interim period of helicopter operations. The specific objective was to achieve a 20 percent increase in favorable or positive responses as related to the helicopter project.

Due to administrative and coordination procedures, a survey was not conducted prior to the implementation of the helicopter program. In the spring of L974, however, a criminal justice class at Georgia State University designed and administered a citizen attitude survey with specific questions concerning the helicopter patrol in the Atlanta area. A copy of the survey and a graphic illustration of the responses are presented in Appendix D. The survey inquiries and results that are particularly pertinent to the helicopter program are as follows.

	Number	Percent
1) Do you believe the use of police helicopter patrol will help the police do a better job?		
No Comment	1	0%
Yes	200	74%
No	40	15%
No Opinion	30	11%
2) Do you believe the helicopter patrol will be more effective than policemen on foot?		
No Comment	21	8%
Yes	99	37%
No	122	45%
No Opinion	29	11%
3) Do you believe the helicopter patrol will be more effective than policemen in patrol cars?		
No Comment	16	6%
Yes	96	35%
No	125	46%
No Opinion	34	13%
4) Do you feel the Atlanta Helicopter patrol is a misuse of the taxpayer's money?		
No Comment	2	1%
Yes	38	14%
No	206	76%
No Opinion	25	9%
5) Is a sense of security gained by the public through the use of helicopter patrol?		
No Comment	6	2%
Yes	149	55%
No	71	26%
No Opinion	45	17%
6) Do you feel the helicopter patrol distracts the driver of the car?		
No Comment	3	1%
Yes	41	15%
No	206	76%
No Opinion	21	8%
7) Do you feel the police helicopter patrol invades the privacy of citizens?		
No Comment	4	1%
Yes	51	19%
No	195	72%
No Opinion	21	8%

Survey Summary

The survey contained the responses of 271 separate individuals on seven specific questions with four possible replies to each inquiry. The total number of responses represents 1897 replies. The following chart summarizes the responses. For the purpose of the summary, a "No" response on questions 4, 6, and 7 were considered a positive reply.

No Comment	53	3%
Positive Reply	1151	61%
Negative Reply	488	26%
No Opinion	205	11%

If the "No Comment" and "No Opinion" responses are deleted from the survey, the following illustration is represented.

Positive Reply	1151	70%
Negative Reply	488	30%

NOTE: Percentages are rounded to the nearest whole number.

INTEGRATED ANALYSIS

Inference/Explanation

The project evaluation section of this report provided a strict representation of the relevent operational data for the program goal and objectives. As mentioned previously, however, specific alterations external to the helicopter project occurred either prior to or during the project period. In order to clarify and/or qualify the data documentation and analysis, it is imperative that these external factors be noted and explained. In order to pursue this purpose, two main topics will be introduced for discussion:

1. Identification of helicopter flight activity and crime reduction.
2. Recognition of other Police Impact Projects.

As indicated in the evaluation section, the project goal of an absolute reduction of 15 % in commercial and residential burglary and 15 % in robbery during the 24 months of the project period was not achieved, even though absolute reductions of 10.9 % and 3.1% were realized in residential burglary and robbery respectively. Due to unavoidable circumstances, the helicopter units recorded only 44.7% of the total projected flight time. Contentions may prevail that flight time lost during the project period contributed to less than the anticipated reduction in crime. However, analysis of data show that there is no correlation between the hours flown by the helicopter units and the number of burglaries and robberies reduced during that period.

The following table shows the percentage of total hours flown in each of the four six month periods and the corresponding decrease (increase) in burglary and robbery during those periods. In order to more accurately measure successive changes between periods, the robbery and burglary data was deseasonalized. Appendix E contains the applicable data periods.

TABLE VIII

	% Flown	Change-Commercial Burglary	Residential Burglary	Total Burglary	Robbery
Period 1	31.1	4.8	4.0	4.2	-3.8%
Period 2	36.9	4.2	4.7	4.6	-5.5%
Period 3	24.1	-6.1	-5.6	5.0	-2.4
Period 4	7.9	-14.6	-18.7	-17.5	-8.7

The greatest percentage reduction in all categories of burglaries and robbery occurred during the periods when the helicopter units recorded its least flight time.

To further accentuate the absence of a direct correlation between the number of hours flown by the helicopter units and the number of burglaries and robberies committed in the four zones, correlation analysis between flight time and deseasonalised crime incidences, by month was performed. The resulting matrix is as follows:

	Flight Time	No. of Burglaries	No. of Robberies
Flight Time (hours)	1	.714	.329
No. of Burglaries	.714	1	.519
No. of Robberies	.329	.519	1

The correlation co-efficients between the number of hours flown by the helicopter units and the corresponding number of burglaries and robberies, by month, are .714 and .329 respectively. These positive correlation coefficients are interpreted to indicate that in those months when helicopter activity was high, measured in terms of number of hours flown, the number of burglaries and robberies committed were higher than the other months. In other words, increases in flight hours were accompanied by increases in burglaries and robberies. This does not, however, suggest

any causal relationship between helicopter activity and crime incidences. The point to be emphasized is that both burglaries and robberies were showing upward trends at the inception of the helicopter project and that successive increases in flight time hours did not result in a reverse trend in those crimes.

The absolute reductions which were realized during the latter part of 1975 may have been effected by two impact programs that were operating parallel with the helicopter project. During the helicopter project period of January 1, 1974, through December 31, 1975, two police projects which were targeted toward robbery and burglary were either implemented or continued under the LEAA Impact Program. These projects were the Anti-Robbery project and the THOR project. As an additional constraint, both projects were operating on a city wide basis.

The Anti-Robbery project was a continuation of the Anti-Robbery/Burglary (ARB) program. The ARB project was implemented prior to the helicopter expansion project (April, 1973) and continued until April of 1974. Between the termination of ARB and the implementation of the Anti-Robbery project (December, 1974) an interim robbery reduction program was fielded by the Atlanta Bureau of Police Services. The present Anti-Robbery project continued past the termination of the helicopter project (December, 1975), therefore, during the entire helicopter program, a robbery reduction effort was in operation. In addition, the AR project operating concurrently with the final helicopter project year (1975) was the most intensive robbery reduction effort, to date, in the City of Atlanta.

The Anti-Robbery project was, however, specifically directed toward commercial and open-space robberies. As noted, total robberies decreased by 3.8 percent when 1975 data is compared to 1973 data base data.

A closer examination of robbery sub-categories will assist in clarifying the achieved crime reduction.

The robbery category is composed of four sub-categories: commercial, open-space, residential, and miscellaneous. The following table illustrates the specific robbery occurrences by sub-category for the base year (1973) and the two project years*

TABLE IX

	1973	1974	% Change	1975	% Change	% Change 73-75
COMMERCIAL	1244	1167	-6.19	697	-40.27	-43.97
OPEN SPACE	2033	2020	- .64	1738	-13.96	-14.51
RESIDENTIAL	435	583	34.02	666	14.24	53.10
MISC.	428	587	37.15	786	33.90	83.64
TOTAL	4140	4357	5.24	3887	-10.79	-6.11

A review of the robbery sub-categories indicates that the total robbery reduction is a result of the substantial decrease in commercial and open-space robberies, i.e., those robbery categories that were impacted by the Anti-Robbery project. The difference in the percentage decrease between City data and helicopter project data can be attributed to the inclusion of Zone 5, which tends to account for a disproportionate number of commercial and open-space robberies. As a future reference point, it should be noted that the decrease for total robbery reduction for both project data and city data occurred in the second year of project operations.

In contrast to the Anti-Robbery project that operated during the entire period of the helicopter project, the Atlanta THOR project, though implemented during the first quarter of 1974, did not actually get underway until the third quarter of 1974. By the end of the 1974 calendar

*Robbery data represents city figures as opposed to Zones 1-4

year, the THOR project had completed the following activities: 4,026 residential surveys; 1,333 commercial surveys; 811 operation ID's; and 212 community presentations, with 11, 163 citizens attending. By December 31, 1975, the following activities had been accomplished by THOR: 50,869 residential surveys; 18,169 commercial surveys; 17,820 operation ID's; and 1,933 community presentations with 84,548 citizens in attendance. Therefore, in review of the THOR activity, the major emphasis of THOR occurred during the 1975 calendar year.

A review of the applicable burglary data for the 1973 base year and the 1974 and 1975 project years indicate that one; both residential and commercial burglary increased from 1973 to 1974, 2.7 percent and 14.1 percent, respectively, and two; residential burglary decreased by 10.9 percent (1973-1975) and commercial burglary increased by .5 percent (1973-1975). Therefore, residential and commercial burglary increased during the first year of the expanded helicopter project while residential burglary decreased during the second year and commercial burglary decreased for the second year when compared to the first project year, but displayed a slight increase when compared to 1973 base commercial burglary data.

While a final evaluation of the THOR project is yet to be done, a preliminary analysis of the project data indicates that direct crime reduction was achieved as a result of the residential and commercial survey done by the THOR unit.

The following table shows the number of commercial and residential surveys done for four quarters and the number of burglaries during each successive quarter. The rational behind lagging the number of surveys done by one quarter is to allow for the affects of the surveys to be realized.

TABLE X

	Commercial Surveys	Residential Surveys	Commercial Burglary	Residential Burglary
Oct-Dec 74	588	2663	1049	2682
Jan-Mar 75	4677	9131	937	2483
April-June 75	3633	9692	957	2277
Jul-Sep 75	3233	16321	745	1924

Correlation analysis between the number of commercial and residential surveys conducted by the THOR Unit in each quarter (starting Oct 74) with the number of residential and commercial burglaries committed in the next quarter was performed. The resulting correlation matrix is:

	Commercial	Residential	Commercial	Residential
No. of Commercial Survey	1	.604	.451	.427
No. of Residential Survey	.604	1	-.970	-.967
No. of Commercial Burglary	-.451	-.970	1	.944
No. of Residential Burglary	-.427	-.967	.944	1

The correlation coefficients between number of commercial surveys and number of commercial burglaries is -.451 and between number of residential surveys and number of residential burglaries is -.967.

While the strength of the correlation co-efficients are important, as measured by the absolute value of the coefficient, in this particular analysis emphasis is being laid on the sign of the coefficient. Negative correlation coefficients are indicative of the fact that increasing the number of surveys conducted was accompanied by a decrease in the number of burglaries committed in the next period. This inverse relationship is particularly strong in the residential burglary category. While more

detailed analysis is imperative to establish firm and conclusive statements about the relationship between the number of surveys and burglaries, the captioned analysis is an indication of the THOR effects in the reduction of burglaries.

Therefore, while an absolute reduction in burglary and robbery was realized during the helicopter project period, detailed data analysis indicates that the crime reduction cannot be solely attributed to the helicopter program.

HELICOPTER SURVEY

Patrol Personnel

In an effort to provide a more meaningful comprehension of the helicopter project as well as to provide input from the primary recipients of the air unit's support, the evaluation staff designed and administered a personnel survey to the patrol officers in Zones 1 through 4. While the survey form was designed with adherence to the project's designated guidelines, the survey allows for and solicits a free expression of ideas and comments from the respondants. The primary purpose of utilizing the survey instrument is to compliment the hard data approach to evaluation via the evaluation component. In view of the many changes affecting a concrete evaluation approach, the survey assists in defining the project's impact in assisting the patrol personnel in performing their task of crime reduction.

The survey which was administered in March, 1976, contains the responses of 176 police officers in Zones 1-4. A copy of the survey form is contained in Appendix F; the survey results are as follows.

1. Total number of police officers surveyed equals 176.

	Number	Percent
Day Shift	70	39.8
Evening Shift	64	36.4
Morning Shift	42	23.9
Total	176	100.0

2. Of the personnel surveyed, 72.7 percent had more than 18 months in the patrol section. This indicates that these personnel were in the field during the period of concentrated helicopter activity.

Length of Patrol Assignment

Months	Number	Percent
0 - 6	12	6.8
7 - 12	23	13.1
13 - 18	13	7.4
18 plus	128	72.7
Total	176	100.0

3. Survey question number 2 is to measure the respondant's awareness of the helicopter patrol in their respective zones. Due to the decreased helicopter activity prior to the survey, the question was structured to imply both present and past awareness for the helicopter patrol. It was anticipated that 100 percent of the respondants would reply affirmatively to the inquiry.

Question 2. Are you or have you been aware of the helicopter patrol in your zone?

	Number	Percent
YES	171	97.7
NO	3	1.7
UNCERTAIN	1	0.6
TOTAL	175	100.0

4. Question number 3 was to determine the level of interaction between the helicopter patrol and the field patrol units.

Question 3. Have you personally received any assistance from a helicopter air unit?

	Number	Percent
YES	168	95.5
NO	8	4.5
UNCERTAIN	-0-	-0-
TOTAL	176	100.0

Of the total 176 respondants, 168 or 95.5 percent had received assistance from the helicopter patrol. Of the 8 no responses, 4 of the respondants had less than six months on patrol.

5. Survey question number 3A was designed to measure the level (quantity) of assistance provided to the patrol units.

Question 3A. If you have received assistance; how many times?

Assists	Number	Percent
1	6	3.7
2-5	55	33.7
6-10	30	18.4
10 plus	72	44.2
Total	163	100.0

Of the 163 responses to this question, 72 or 44.2 percent had received helicopter assistance in 10 or more incidences.

6. The purpose of question 3b was to determine the types of activities where the helicopter units assisted the ground patrol.

Question 3b. If you received assistance, for what types of major crime or activity?

	Number	Percent
Commercial Robbery	97	18.3
Residential Robbery	47	8.9
Open-Space Robbery	41	7.8
Commercial Burglary	108	20.4
Residential Burglary	114	21.6
Homicide	23	4.3
Assault	73	13.8
Rape	26	4.9
Total	529	100.0

From the results, it appears that burglary received the greatest activity for the helicopter patrol with residential and commercial burglary accounting for 21.6 percent and 20.4 percent of the self-reported 529 incidences. Other areas of assistance that were commonly noted are as follows: high speed chases, alarms, stolen vehicles, hit and run, and police emergency assistance calls.

7. Questions 3C and 3D were utilized to measure the effectiveness of the helicopter patrol in assisting ground units in apprehending criminal offenders.

Question 3C. If you received assistance, did it result in an arrest?

	Number	Percent
YES	106	64.6
NO	33	20.1
UNCERTAIN	25	15.2
TOTAL	164	100.0

Question 3D. If the helicopter air unit assisted in the arrest, do you think the arrest(s) could have been made without the helicopter's assistance?

	Number	Percent
YES	14	9.6
NO	72	49.3
UNCERTAIN	60	41.1
TOTAL	146	100.0

The responses to question 3D are exceptionally interesting. In those situations where an air unit assisted in an arrest, approximately 50 percent of the respondants indicated that the arrest could not have been made without the air units assistance. As a comparison, 9.6 percent of the respondants indicated that the arrest could have been effected without the helicopter's assistance and 41.1 percent were not certain if the helicopter's assistance aided them in effecting an arrest.

8. The series of questions in number 4 are intended to illustrate the level of activity that was initiated by the air units.

Question 4. Has the helicopter unit ever called on you to investigate suspicious activity?

	Number	Percent
YES	159	91.9
NO	11	6.4
UNCERTAIN	3	1.7
TOTAL	173	100.0

Question 4A. If yes, how many times?

Request	Number	Percent
1	9	5.6
2 - 5	58	36.0
6 - 10	44	27.3
10 plus	50	31.0
Total	161	100.0

Question 4B. If you have responded to the helicopter's request to investigate suspicious activity, did your presence result in an arrest or the prevention of a crime?

	Number	Percent
YES	78	47.9
NO	38	23.3
UNCERTAIN	47	28.8
TOTAL	163	100.0

Question 4C. If the helicopter's presence resulted in an arrest or the prevention of a crime, what type of crime or activity was involved?

	Number	Percent
Commercial Robbery	15	11.8
Open Space Robbery	7	5.5
Residential Robbery	9	7.6
Assault	17	13.4
Commercial Burglary	34	26.8
Residential Burglary	34	26.8
Homicide	3	2.4
Rape	8	6.3
Total	127	100.0

Other categories frequently mentioned are as follows: Auto Theft, Larceny from Auto, and Driving Under the Influence.

Question five was an attempt to determine the level of support for the helicopter project from the field units.

Question 5. Do you think that the helicopter makes your patrol efforts more effective?

	Number	Percent
YES	153	88.4
NO	8	4.6
UNCERTAIN	12	6.9
TOTAL	173	100.0

Approximately 90 percent of the surveyed patrol officers indicated that the utilization of police helicopters contributed to their effectiveness.

Question number 5A is perhaps the most interesting of all the survey questions. The question allows for a subjective interpretation of the primary contributions of the helicopter patrol in law enforcement as perceived by the patrol personnel.

Question 5A. If you think helicopter patrol makes your efforts more effective, select and prioritize from the following list those factors which determine your attitude?

Of the 176 completed surveys, only 93 respondants had adequately completed question 5A for the proper analysis of determining the relative importance of police applied helicopter patrol.

The respondants were asked to rank in order those aspects of helicopter patrol that contributed to the increased effectiveness of field patrol operations. The respondants were asked to rank from 1 - 5 in order of importance the following factors: preventive measures, apprehension measure, response capabilities, observation capabilities, officer security measure. In addition, the respondants were asked to specify other factors which they considered important.

FREQUENCY OF PRIORITIZED RESPONSES

		PRIORITY 1	2	3	4	5
Preventive Measure	FREQUENCY	11	16	20	20	26
Apprehension Measure		17	20	19	27	10
Response Capabilities		15	21	25	17	15
Observation Capabilities		23	17	15	16	22
Officer Security Measure		27	19	14	13	20

PERCENTAGE DISTRIBUTION OF FREQUENCY

	1	2	3	4	5
Preventive Measure	11.8	17.2	21.5	21.5	28
Apprehension Measure	18.3	21.5	20.4	29	10.8
Response Capabilities	16.2	22.6	26.9	18.3	16.2
Observation Capabilities	24.7	18.3	16.2	17.2	23.7
Officer Security Measure	29	20.4	15.2	14	21.5

By limiting the determination of helicopter contribution or utility to the selected first priority, it appears that the officer security aspect of helicopter patrol receives the greatest support. Of the possible 93 selections for priority number 1, officer security was noted 27 times. By using the frequency of the first selection, the distribution of the suggested helicopter utility in descending order is as follows: Officer Security, Observation Capabilities, Apprehension Measure, Response Capabilities, Preventive Measure.

As another method of determing the relative importance of each factor, an average of the total score was derived.

This was accomplished by aggregating the sums of each priority multiplied by the stated frequency. The limits of such a computation ranges in descending order of importance from 1 - 5.

	Weighted Average	Total Score
Preventive Measure	3.37	313
Apprehension Measure	2.92	272
Response Capabilities	2.96	275
Observation Capabilities	2.97	276
Officer Security	2.78	259

A review of the weighted average indicates that the respondants selected officer security as the most important factor of police helicopter patrol. The least contributing factor was the crime prevention aspect of helicopter patrol. Second to officer security was the apprehension assistance capabilities of the air units. It should be noted that both the response factors and the observation function of the air units contribute to the abilities of criminal apprehension.

As a means of comparison, the weighted average was computed for each watch.

Weighted Average by Watch

	Day	Evening	Morning
Preventive Measure	3.32	3.45	3.33
Apprehension Measure	2.76	3.23	2.79
Response Capabilities	2.82	3.	3.13
Observation Capabilities	3.29	2.68	2.83
Officer Security Measure	2.82	2.65	2.92

Priority by Watch

	Day	Evening	Morning
Preventive Measure	5	5	5
Apprehension Measure	1	4	1
Response Capabilities	2*	3	4
Observation Capabilities	4	2	2
Officer Security Measure	2*	1	3

In an attempt to determine the perception of the field units in regard to the helicopter's activities, the survey contained a question asking the respondants to explain the helicopter's operations. The responses were varied on this point but generally indicated that the helicopter units were conducting various types of patrol activity. When asked what types of additional activity the helicopter units should perform, the most frequently mentioned activity was the use of helicopter support for emergency medical support.

As a final question, the respondants were asked for any additional comments that pertained to the helicopter project.

In reviewing the replies to the inquiry, it was possible to segment the responses into three broad categories: general comments, recommendations, complaints. The following are excerpts from the survey forms.

General Comments

1. On the morning watch, the helicopter units are effective in assisting the beat officer in locating fleeing perpetrators.
2. The helicopter units assist in making arrests that may not be possible with just ground units.
3. Helicopter patrol gives the patrolmen the advantage in apprehending criminal offenders.
4. Helicopter patrol provides the police with an advantage that the criminal element cannot equal.
5. The helicopter unit can secure the crime scene when the perpetrators are expected to be in the area.
6. Once an air unit spots the criminal, it is very difficult for the offender to escape.
7. The helicopter's rapid response decreases the available avenues of escape for the criminal.

8. When back up from other patrol units is not available, the helicopter unit provides a feeling of security on serious calls.
9. On a busy night, the air unit can back up the beat officer on serious calls when other units are out of service.
10. The air unit can locate an officer in an emergency situation faster than regular patrol units.

Recommendations

1. If observers are qualified, helicopters are beneficial to the beat officer.
2. More qualified police observers are needed for effective helicopter patrol and assistance.
3. The helicopter units should remain over high crime areas when not on call.
4. The helicopter units should spend more time over specific beats and alternate on an irregular basis.
5. It would be a good idea for each beat officer to ride in the helicopter in order to point out problem areas in the respective beat.
6. The helicopter units should spend more time over specific beats, such as beats that have a high burglary rate, etc.

Complaints

1. The helicopter units are never airborne when they are needed.

CONCLUSIONS

It is particularly difficult to make recommendations for the future operations of the Atlanta Police Helicopter Unit based on the Operation and Evaluation Analysis of current Atlanta Helicopter Expansion Project (Impact Grant: 73-DF-04-0023). The fact that no direct correlation was found to exist between helicopter flight hours and reductions in burglary and robbery incidents might lead one to the conclusion that the helicopters are not a viable unit within a Police Bureau. In arriving at this conclusion, however, one has focused on only one aspect of helicopter usage: Preventive Patrol.

Quite possibly it is true that the Helicopter is not a good patrol vehicle. For example: helicopters cannot operate during inclement weather; the cost of operations has increased greatly (from a low of $18.50/hour to over $30.00/hour); helicopters require more scheduled maintenance per operating hour than do automobiles; helicopters require two personnel (pilot and observer) for operation; a helicopter crew without landing cannot effect an arrest without assistance from a ground unit; and the very mobile nature of a helicopter unit does not allow for close supervision of the crew in carrying out its preventive patrol function. As mentioned previously, the patrol function is only one aspect of helicopter usage. In Atlanta the helicopters have provided assistance through aerial observation to ground units both at crime scenes (bank robberies, burglaries, etc.) and at natural disasters (tornados, floods, etc.). Further, helicopters of larger personnel capacity than those currently employed by the Atlanta Police (helicopters currently used have a seating capacity of only two) could be used to evacuate people from the roofs of burning buildings, to transport

seriously injured persons to hospitals, and to transport police/fire personnel to the scenes of emergencies.

In summary, absent supporting statistics for the use of helicopters as a preventive patrol vehicle, this function for helicopters should probably be deemphasized. The helicopter's utility as an aerial observation platform during emergencies however, should not be minimized. Finally the consideration of obtaining larger capacity helicopters for emergency situations should be strongly encouraged.

APPENDIX A

HELICOPTER EVALUATION COMPONENT

GOAL

Reduce residential and commercial burglaries by 15% within 24 months from those zones being patrolled by helicopters. Robberies will be reduced by 15% within the 24 months for the zones being patrolled. The evaluation period will begin January 1, 1974.

OBJECTIVES

1. The ratio of target crime to non-target crime responses will be no less than .50.

2. The success rate on target crimes responded to by the helicopter will be 20% greater than that for target crimes responded to the previous year.

$$\text{Success rate} = \frac{\text{Number of arrests for target crimes where helicopter involved}}{\text{Total target crimes responded to minus the number of false calls for target crimes}}$$

$$\text{Area Success Rate} = \frac{\text{Number arrests for target crimes in zones patrolled}}{\text{Total target crimes in Zones patrolled less unfounded target crimes}}$$

3. Provide city-wide aerial patrol on a 24-hour/day, seven days per week basis. Aerial service will be considered provided to a district if a minimum of 5 hours of flight time within each 8 hour shift if provided at all times when visibility is not below one mile and ceiling not below 1000 feet.

4. On a random city-wide survey conducted before and during the time the project is operational, there will be a 20% increase in favorable or positive responses to the following questions:

   A) During the last week, have you seen or been aware of helicopter police patrols?

   B) Do you believe the use of helicopter police patrols will help the police do a better job? Why?

PERFORMANCE MEASURES

GOAL 1

Let b_0 = Number of residential and commercial burglaries during 1973 for the zones patrolled by helicopters.

b_2 = Number of residential and commercial burglaries during 1975 for the zones patrolled by helicopters.

Let r_0 = Number of robberies during 1973 for the zones patrolled by helicopters.

r_2 = Number of robberies during 1975 for the zones patrolled by helicopters.

If $b_2 \leq b_0$

and $r_2 \leq r_0$ the goal will be met.

OBJECTIVE 1

Let c = Total number of crime calls responded to by helicopter

t = Total number of target crime calls responded to by helicopter.

If $c \geq .5\ t$ the objective will be met.

OBJECTIVE 2

Let a_0 = Number of 1974 arrests for target crimes in zones patrolled by helicopters.

t_0 = Total number of 1974 target crimes reported in zones patrolled by helicopters.

ℓ_0 = Total number of 1974 target crimes unfounded in zones patrolled by helicopters.

a_2 = Number of 1975 arrests for target crimes in zones patrolled by helicopters.

t_2 = Number of 1975 target crimes reported in zones patrolled by helicopters.

ℓ_0 = Total number of 1975 target crimes unfounded in zones patrolled by helicopters.

$$\text{If } \frac{a_2}{t_2-\ell_2} \geq 1.2 \frac{a_0}{t_0-\ell_0}$$

OBJECTIVE 3

$$\% \text{ hours flown of hours scheduled} = \frac{\text{Hours flown}}{\text{Total Hours Scheduled-Total hours lost to weather}}$$

$$\% \text{ complete shifts flown of shifts scheduled} = \frac{\text{Full shifts flown}}{\text{Total shifts scheduled-Shifts not completed due to weather}}$$

These percentages should increase through the duration of the project. 100% for both ratios indicates the helicopter force operating at the expected level of activity.

OBJECTIVE 4

Let n_0 = Number of people surveyed on the initial survey.

x_0 = Number of yes answers to Question A on the first survey.

y_0 = Number of yes answers to Question B on the first survey.

n_1 = Number of people surveyed on the second survey.

x_1 = Number of yes answers to Question A on the second survey.

y_1 = Number of yes answers to Question B on the second survey.

$$\text{If } \frac{x_1}{n_1} \geq 1.2 \frac{x_0}{n_0} \text{ and}$$

$$\frac{y_1}{n_1} \geq 1.2 \frac{y_0}{n_0} \text{ the objective will be met.}$$

APPENDIX B

Helicopter Response-1974

	January	February	March	Qtr. 1
Target Crime	318	575	700	1593
Non-Target Crime	416	686	1228	2330
Total	734	1261	1928	3923

	April	May	June	Qtr. 2
Target Crime	397	353	617	1367
Non-Target Crime	520	472	884	1876
Total	917	825	1501	3243

	July	August	Sept.	Qtr. 3
Target Crime	742	739	824	2305
Non-Target Crime	852	843	844	2539
Total	1594	1582	[illegible]	4844

	October	November	Dec.	Qtr. 4
Target Crime	965	894	570	2429
Non-Target Crime	996	740	510	2246
Total	1961	1634	1080	4675

Helicopter Response-1975

	January	February	March	Qtr. 1
Target Crime	647	616	516	1779
Non-Target Crime	655	660	461	1776
Total	1302	1276	977	3555

	April	May	June	Qtr. 2
Target Crime	563	285	227	1075
Non-Target Crime	520	370	237	1127
Total	1083	655	464	2202

	July	August	Sept.	Qtr. 3
Target Crime	234	191	127	552
Non-Target Crime	369	362	191	922
Total	603	553	318	1474

	October	November	Dec.	Qtr. 4
Target Crime	75	220	269	564
Non-Target Crime	106	191	219	516
Total	181	411	488	1080

APPENDIX C

Target Crimes Reported
Zones 1-4

	Rape	Robbery	Aggravated Assault	Burglary	Total
1973					
July	34	276	182	1204	1696
Aug.	50	268	180	1224	1722
Sept.	23	280	179	1228	1710
Oct.	30	261	172	1267	1730
Nov.	43	302	156	1232	1733
Dec.	30	328	166	1281	1805
1974					
Jan.	38	344	200	1345	1927
Feb.	30	236	151	1130	1547
Mar.	36	246	256	1096	1634
Apr.	29	196	217	1036	1478
May	41	203	223	1008	1475
June	29	222	218	945	1414
July	21	230	248	1223	1722
Aug.	31	231	241	1249	1752
Sept.	42	216	229	1422	1909
Oct.	26	237	207	1509	1979
Nov.	21	339	211	1290	1861
Dec.	15	418	194	1515	2142
1975					
Jan.	19	291	214	1530	2054
Feb.	19	248	179	1170	1616
Mar.	19	257	248	1079	1603
Apr.	22	206	211	852	1291
May	41	192	232	1018	1483
June	29	220	255	907	1411
July	50	266	260	1118	1694
Aug.	45	240	278	1113	1676
Sept.	29	188	201	969	1387
Oct.	47	182	239	968	1436
Nov.	20	225	209	992	1446
Dec.	17	274	196	1016	1503

Target Crime Arrests-Uniform Patrol
Zones 1-4

	Rape	Robbery	Aggravated Assault	Burglary	Total
1973					
July	3	4	18	25	50
Aug.	2	5	28	29	64
Sept.	2	5	42	42	91
Oct.	2	2	14	39	57
Nov.	3	4	38	36	81
Dec.	-	3	34	31	68
1974					
Jan.	1	5	20	28	54
Feb.	3	7	39	50	99
Mar.	7	4	42	41	94
Apr.	4	9	47	37	97
May	4	2	40	61	107
June	4	6	44	59	113
July	4	2	72	50	128
Aug.	3	5	57	56	121
Sept.	3	11	51	73	138
Oct.	-	7	32	61	100
Nov.	1	6	42	62	111
Dec.	-	11	29	89	129
1975					
Jan.	-	20	78	79	177
Feb.	2	22	61	100	185
Mar.	3	18	70	88	179
Apr.	1	3	53	73	130
May	-	6	80	113	199
June	1	14	91	81	187
July	2	15	88	92	197
Aug.	-	14	108	97	219
Sept.	-	11	70	108	189
Oct.	4	15	90	83	192
Nov.	-	24	61	100	185
Dec.	-	14	52	90	156

APPENDIX D

Survey on Atlanta Police Department
Conducted by Students - Criminal Justice Department
School of Urban Life - Georgia State University
Atlanta, Georgia

1. During the past week, have you seen or been aware of increased police helicopter patrol?

   Yes____ No____ No Opinion____

2. Do you believe the use of police helicopter patrol will help the police do a better job?

   Yes____ No____ No Opinion____

3. Why:_____

   _____

   _____

4. Do you believe the helicopter patrol will be more effective than policemen on foot?

   Yes____ No____ No Opinion____

5. Do you believe the helicopter patrol will be more effective than policemen in patrolcars?

   Yes____ No____ No Opinion____

6. Do you feel the Atlanta helicopter patrol is a misuse of the taxpayers' money?

   Yes____ No____ No Opinion____

7. Is a sense of security gained by the public through the use of helicopter patrol?

   Yes____ No____ No Opinion____

8. Should the helicopter patrol hours be decreased?

   Yes____ No____ No Opinion____

9. Should the helicopter patrol hours be increased?

   Yes____ No____ No Opinion____

10. Do you feel the helicopter patrol distracts the drivers of cars?

    Yes____ No____ No Opinion____

11. Do you feel the police helicopter patrol invades the privacy of citizens?

    Yes____ No____ No Opinion____

12. Is the crime in your residential area severe?

Yes_____ No_____ No Opinion_____

Is it increasing?

Yes_____ No_____ No Opinion_____ Remaining at same level_____

Is it decreasing?

Yes_____ No_____ No Opinion_____

13. Would you like to see more police in your area:

Yes_____ No_____ No Opinion_____

14. Have you had an occasion to call on the police for aid?

Yes_____ No_____ No Opinion_____

15. Were they helpful and readily available?

Yes_____ No_____ No Opinion_____

16. Do you feel the police are doing their best to combat crime in your area?

Yes_____ No_____ No Opinion_____

17. Is your general impression of the Atlanta Police Department favorable?

Yes_____ No_____ No Opinion_____

18. Do you have any suggestions for the better functioning of the police in your area?

_____

_____

_____

_____

19. Do you feel that the current 12-week police academy course is enough training for police candidates?

Yes_____ No_____ No Opinion_____

20. Race: Black_____ White_____ Other_____

21. Age:_____ 22. Sex: Male_____ Female_____

23. Education level: Grade School_____ High School_____ Attended College_____ College Graduate_____

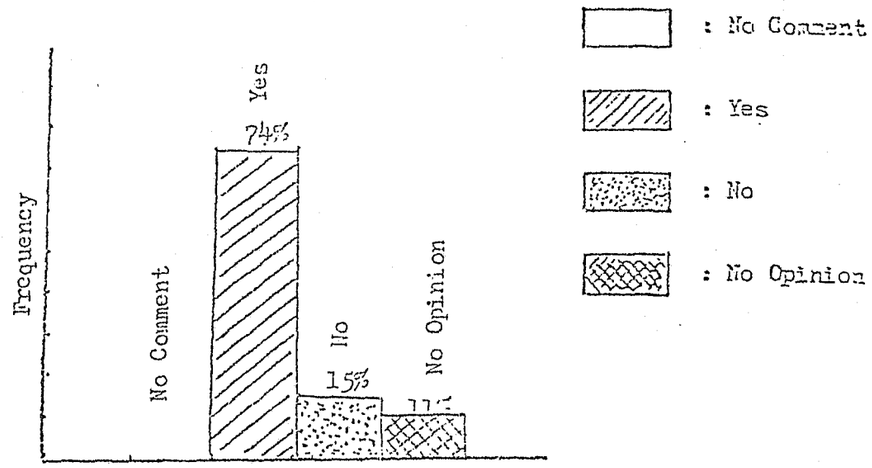
24. Area of residence in city:_____

25. Family income: To 4,000_____ 4,001 to 7,500_____ 7,501 to 10,000_____

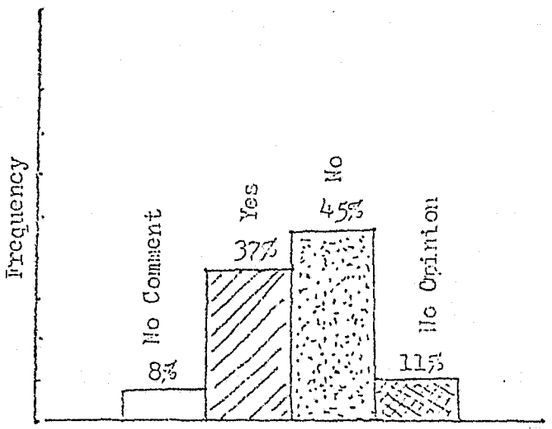
10,001 to 15,000_____ 15,001 to 20,000_____ 20,001 to 25,000_____ Over 25,001_____

CITIZEN ATTITUDE SURVEY

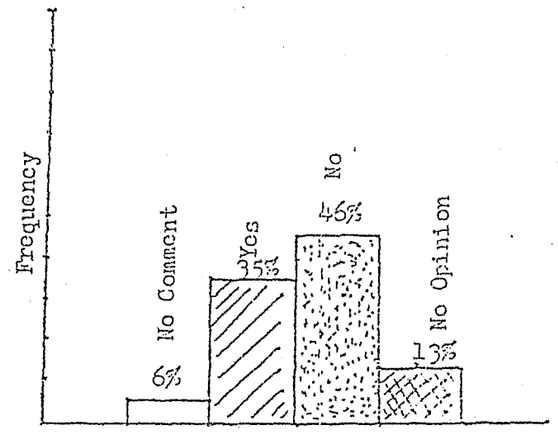
Q1 · Do you believe the use of police helicopter patrols will help the police do a better job ?



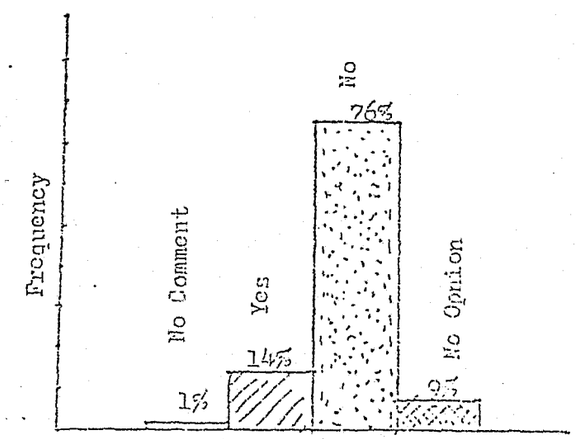
Q2 · Do you believe the helicopter patrol will be more effective than policemen of foot ?



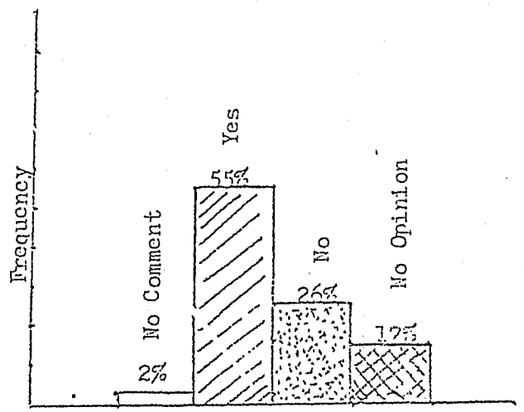
Q3. · Do you believe the helicopter patrol will be more effective than policemen in patrol cars ?



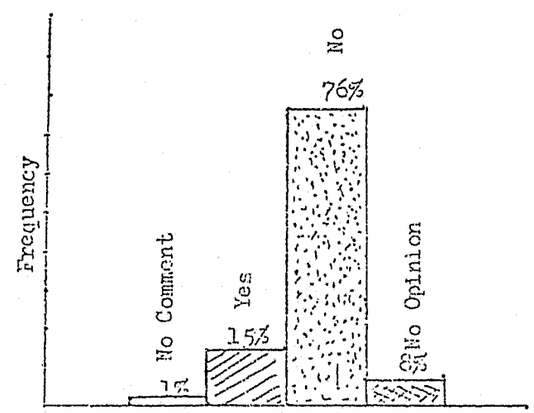
Q4. · Do you feel the Atlanta Helicopter patrol is a misuse of the taxpayers' money ?



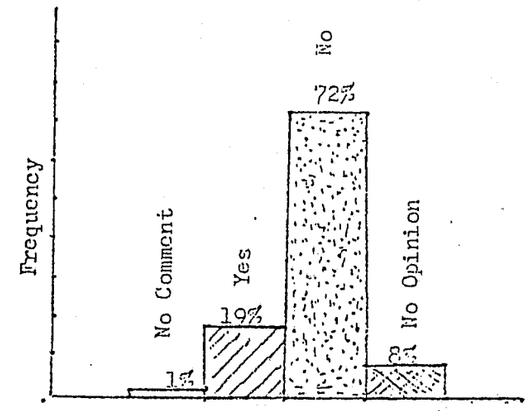
Q5. Is a sense of security gained by the public through the use of helicopter patrol ?



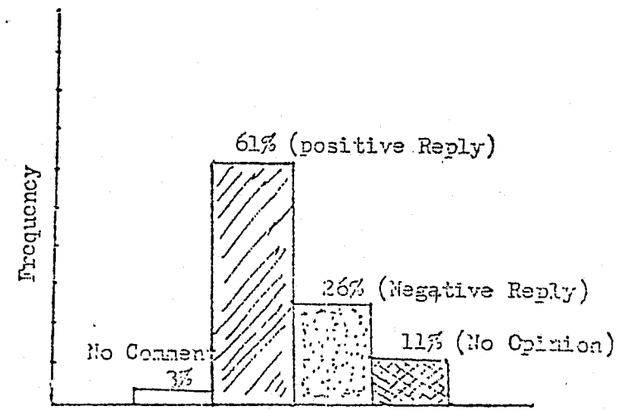
Q6. Do you feel the helicopter patrol distracts the driver of a car ?



Q7. Do you feel the police helicoptor patrol invades the privacy of citizens ?



Over-all Responses to the Helicopter Patrol



APPENDIX E

SEASONAL INDEX

	Commercial Burglary	Residential Burglary	Robbery
January	1.228	1.170	1.387
February	.948	.956	.926
March	1.071	.839	.969
April	.876	.759	.780
May	.794	.877	.804
June	.854	.773	.906
July	.921	.999	.903
August	.913	1.015	.913
September	1.039	1.157	.875
October	1.063	1.251	.936
November	1.019	1.020	1.342
December	1.275	1.184	1.259

APPENDIX F

HELICOPTER SURVEY

ZONE_____ WATCH_____

1. How long have you been assigned to the patrol section? _____months.

2. Are you or have you been aware of the helicopter patrol in your zone?
YES_____ NO_____ UNCERTAIN_____

3. Have you personally received any assistance from a helicopter air unit?

YES_____ NO_____ UNCERTAIN_____

3a. If you have received assistance; how many times? _____1; _____2 - 5;

_____6 - 10; _____more than 10.

3b. If you have received assistance, for what types of crime or activity?

Commercial Robbery _____
Residential Robbery_____
Open Space Robbery_____
Commercial Burglary_____
Residential Burglary_____

Homicide _____
Assault_____
Rape_____
Others (specify)_____

3c. If you have received assistance, did the assistance result in an arrest?

YES_____ NO_____ UNCERTAIN_____

3d. If the helicopter air unit assisted in the arrest, do you think the arrest(s) could have been made without the helicopter's assistance.

YES_____ NO_____ UNCERTAIN_____

4. Has the helicopter unit ever called on you to investigate suspicious activity?

YES_____ NO_____ UNCERTAIN_____

4a. If yes, how many times? _____1; _____2 - 5; _____6 - 10;

_____more than 10.

4b. If you have responded to the helicopter's request to investigate suspicious activity, did your presence result in an arrest or the prevention of a crime?

YES_____ NO_____ UNCERTAIN_____

4c. If answer is yes, what type of crime or activity was involved?

Commercial Robbery _____ Residential Robbery _____
Open Space Robbery_____ Homicide_____
Assault_____ Rape_____
Commercial Burglary_____ Residential Burglary_____
Others (Specify)_____
_____

5. Do you think that the helicopters make your patrol efforts more effective?

YES_____ NO_____ UNCERTAIN_____

5a. If yes, why do you think so? (Place a number beside those reasons which you feel the helicopter benefits you. For your best reason, place no. 1, for your second best choice place a 2, and so forth.)

It serves as a good preventive measure _____
It serves as a good apprehension measure_ _____ _____
It can respond to calls quickly_____
It can see more area and therefore more activity_____
Provides a security measure to officers in unusual places or in unusual circumstances_____
Others (specify) _____

6. In your opinion, what do you think the helicopters actually do when they are flying? (Briefly describe in your own words.) _____
_____
_____
_____
_____.

6a. Are there other activities you would like the helicopter units to perform?

YES_____ NO_____ UNCERTAIN_____

6b. If yes, explain the activities. _____
_____
_____
_____.

7. Are there any comments you would like to make about the helicopters? If so, please state. _____
_____
_____
_____
_____
_____
_____
_____

END

7 cases/week

B