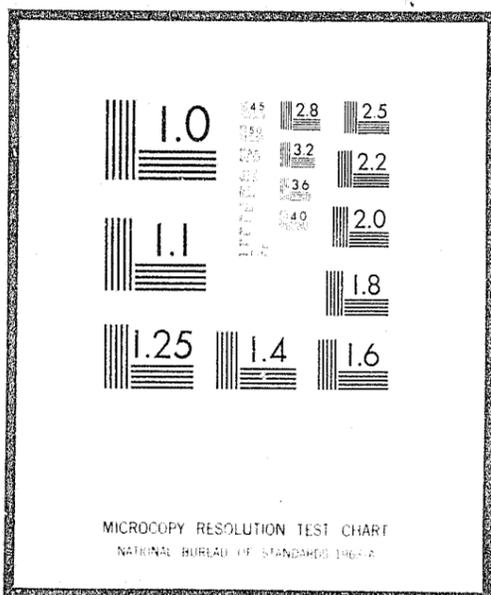


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ANALYSIS OF COSTS AND COMPONENTS OF THE HOME-FLEET PLAN,  
LEXINGTON-FAYETTE URBAN COUNTY POLICE DEPARTMENT

NCJRS

MAR 25 1977

ACQUISITIONS

April 13, 1976

Department of Justice  
Evaluation Section

William P. Curtis  
Mary Ellen Curtin



COMMONWEALTH OF KENTUCKY  
DEPARTMENT OF JUSTICE  
FRANKFORT

EXECUTIVE OFFICE OF STAFF SERVICES

July 30, 1976  
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Mr. Richard Linster, Assistant Director  
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and Criminal Justice  
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Washington, D.C. 20024

Dear Mr. Linster,

Enclosed are copies of evaluation reports recently completed by the Evaluation Section. Six evaluations have been completed, one of which is for a project not funded by LEAA. The non-LEAA project is the Home-Fleet Plan of the Lexington-Fayette Urban County Division of Police. Evaluation of the Home-Fleet Plan was requested by the Mayor of Lexington.

We would appreciate your comments, questions, criticisms of these reports.

Yours truly,

*Michael W. McCoy*  
Michael W. McCoy, Director  
Division of Planning

*Mary Ellen Curtin*  
Mary Ellen Curtin, Supervisor  
Evaluation Section

MEC/rb  
cc: Central file

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## INTRODUCTION

During the 1970's, the crime rate has risen rapidly nationwide. Considerable research has been conducted in an attempt to discover the causes of criminal behavior and how to prevent and control it. However, satisfactory explanation of criminal behavior and the marked increases in its incidence from year to year is yet to be developed. As a result of this fact, the policemen's task of controlling and preventing criminal behavior is a formidable one, to say the least.

In view of the foregoing, a number of police departments in this country have, through their own initiative, implemented some creative and innovative programs in attempting to deal with a serious crime problem. One of these programs, which is beginning to receive attention, involves the "take-home" or "home-fleet" police car.

The take-home car concept evolved as a program to improve crime prevention and control. In a take-home police car program, the officer is authorized, using department fuel, to take his assigned car home and keep it for his personal use during off-duty hours. Whenever driving the patrol car during off-duty time, the officer is required to have his radio on at all times in order to be available to respond to calls from the dispatcher. In addition, the off-duty officer is expected to initiate law enforcement activities while driving his take-home car. As a result, the take-home police car program results in additional on-the-street patrol time. Implementing such a program requires that a police department purchase a sufficient number of cars to enable all or most of its officers to keep a car 24 hours a day.

The more traditional arrangement, a pool police car system, consists of a pool of cars which policemen utilize in eight hour shifts. A pool car is likely to be driven 24 hours a day. At the end of his shift, the policeman returns his car to a central location in order that another policeman may use it during the following shift. A pool system allows a police department to operate with a minimum number of cars.

As far as can be determined from a literature search, only a small number of police departments have implemented take-home police car programs. Some of these are Indianapolis (Indiana), St. Paul (Minnesota), Prince George's County (Maryland), Arlington County (Virginia), Jacksonville (Florida), and Lexington (Kentucky). Each of these police departments has conducted studies on their take-home police car programs, but results with regard to comparative costs of a take-home car program with a pool-car system are either totally absent or inconclusive. (See references.)

One of the major arguments advanced in favor of take-home police car plans in all of the Home-Fleet studies reviewed was that of increased visibility of the marked police car resulting from increased on-the-street time. The theory is that increased visibility provides benefits such as deterring crime and traffic violations, improving citizen-police relations, and enhancing police back-up capability. However, this theory is yet to be supported adequately with evidence.

## THE PRESENT STUDY

Concerned citizens of the communities that have Home-Fleet police car programs frequently raise valid questions about it. For example, is a Home-Fleet system more or less costly than a pool-fleet system? What, if any, additional services do citizens receive from a Home-Fleet system?

The present study will examine the Lexington-Fayette Urban County Police Department Home-Fleet program with the intention of providing answers to the above questions.

## METHOD

In order to compare purchase and operating costs of a Home-Fleet plan versus an all pool plan, cost figures were projected for a 3-year period--FY1977, FY1978, and FY1979\*. Note should be taken that the present analysis is for vehicles assigned to the Patrol Bureau only, which presently consists of 169 vehicles. For an all pool plan for Patrol, it was estimated that a minimum of 80 vehicles would be needed. The rationale for limiting the present analysis to the Patrol Bureau is that the distribution of pool and take-home vehicles would remain quite similar for other Bureaus regardless of plan; hence, there should be little added difference, if any, in the costs of the two plans for the entire department. In other words, any significant difference in cost would be due to the take-home vehicles assigned to Patrolmen.

All operating cost figures for the Home-Fleet projection for the next 3-year period were available locally, i.e., figures for calendar year 1975. Comparable data for estimating costs of an all-pool plan were not available locally due to the city-county merger and the initiation of the Home-Fleet plan 3 years ago. Therefore, it was decided to use costs of pool vehicles in other police departments similar to Lexington as the basis for the local estimate. The plan was to secure from other departments a value of cents-per-mile to represent all operating costs (excepting insurance, depreciation, and overhead) which would then be multiplied by the Lexington figure of total on-duty miles driven for one year. It should be noted that overhead costs are not included in any data reported or in any estimates for the 3-year period. (By overhead is meant general administrative factors such as salaries, rent, and utilities.)

### Operating Costs

The Lincoln, Nebraska all pool plan. To obtain comparative operating cost figures for an all pool police car plan, 10 police departments with all pool plans in cities of

\*No adjustment has been made in any of the cost figures presented for possible inflation.

comparable size and make-up to Lexington were contacted. Each department was asked for their total operating cost-per-mile for their patrol pool car systems. Of the 10 departments contacted, Lincoln, Nebraska provided data that would seem most comparable for purposes of this report.

The Lincoln operating cost data included gasoline, oil and other fluids, labor, maintenance, normal replacement, and repair. From this data, it was determined that the operating cost for their 440 cubic inch Plymouth Furies was 17.7 cents per mile. In addition, the operating cost for their 400 cubic inch Dodge Monacos was 12.1 cents per mile.

The Lexington Home-Fleet plan 1975. To determine the cost of the Home-Fleet plan for calendar year 1975, it was necessary to collect and summarize data from several different sources. Cost variables are listed below:

1) Gasoline--Gasoline costs for Lexington's 169 patrol cars were not readily available. To determine these costs, the number of gallons of gas pumped into each car for each refill for the entire year of 1975 were totalled from gasoline log sheets. After deriving the total number of gallons of gas used during 1975, the total was multiplied by 41.1 cents (cost per gallon) to determine gasoline costs.

2) Inside maintenance--This variable included all maintenance done at the police department garage and covered oil, lubrication, replacement parts, etc. These costs were not readily available for the 169 patrol vehicles. To determine maintenance costs, each maintenance record for calendar year 1975 for each of the 169 vehicles was totalled.

3) Inside labor--Police garage labor costs were not available for patrol vehicles separately; therefore, this amount was prorated from the total for all vehicles. Total labor costs (includes base salary, pension, fringe, and overtime) for 16 garage service men for calendar year 1975 were determined. The 169 Home-Fleet patrol vehicles represent 52% of the 325 total department vehicles but probably require more labor on the average since all other vehicles includes wagons, two-wheelers, etc; therefore, this figure for total labor costs was multiplied by 55% to represent labor attributed to the patrol Home-Fleet vehicles.

4) Outside repair--This variable included all maintenance on police cars done outside the city garage, consisting mainly of accident repair not covered by insurance and wheel alignment. These costs were derived by totalling the figures from each of the police garage's outside maintenance folders.

5) Insurance--These costs were obtained from the Urban-County Department of Finance which indicated that the cost per car is \$166. This was derived by taking the cost figure of insuring all city government vehicles and dividing by number of vehicles. Insurance costs for police cars only were not available.

### Purchase Costs

Three-year vehicle purchase costs and resale estimates for all pool and Home-Fleet plans are presented in Tables 1 through 4. Lexington police department representatives indicated that no accessories would be needed during this period. It should be noted that in discussing vehicles of various sizes, the make of the vehicle may be given; however, this is for descriptive purposes only.

A hypothetical pool plan for Lexington. If Lexington changes to an all pool plan in the summer of 1976, it was estimated that the department would need 80 new, large 440 or 460 cubic inch engine police cars for the Patrol Bureau. As noted in the Introduction, these pool cars would be driven 24 hours a day. They would all have to be replaced yearly. See Tables 1 and 2.

The distribution of these 80 pool vehicles, as recommended by a representative of the Research and Development (R and D) Unit of the Police Department, follows: 28 for patrolmen beats, 7 for canine, 5 for downtown patrol, 1 for community project sergeant, 4 for the 20 reserve officers, 15 for patrol commanders, and 20 for down-time of vehicles.

The need for large 440/460 engine vehicles for an all pool plan, as indicated by the R and D representative, can be based on two factors: 1) The jurisdiction of this police department is unusual in that patrol beats are county, with interstate highways, as well as inner city; and any pool vehicle may be needed to patrol either or both of these kinds of beats for a given shift. 2) There is improved performance from the large engine vehicles on the interstate highways. Additionally, cost information on the large engine is presented for descriptive and comparison purposes.

Continuation of Home-Fleet plan for Lexington. In the event of retaining the Home-Fleet plan, a representative of the Police Department R and D Unit indicated that none of the present Home-Fleet cars would be replaced until FY 1977. At that time, the department would begin replacing the present 440/460 cubic inch engine Home-Fleet cars with 350 cubic inch engine cars, or cars with a comparable size engine. It was requested that the present report include three-year projection costs for two annual replacement schedules of the Home-Fleet vehicles. In one schedule, Table 3, one-fourth of the 169 vehicles would be replaced in FY 1977; one-fourth would be replaced in FY 1978; and one-half would be replaced in FY 1979. At the present time, these vehicles are three years old; therefore, until the 1978 replacement, 127 vehicles would be driven in their fourth year and until the 1979 replacement, 85 vehicles would be driven in their fifth year.

In the second Home-Fleet replacement schedule, Table 4, one-third of these presently three-year old vehicles would be replaced each year.

#### Additional Components of Home-Fleet

In addition to the dollars and cents cost comparison of Home-Fleet and pool plans, the question was raised earlier concerning additional components of the Home-Fleet. Estimates for two kinds of these components are presented in this report: 1) off-duty patrol activity and 2) the visibility factor. The visibility factor was concerned with off-duty Home-Fleet vehicles while being driven or parked in such locations as shopping centers. Estimates for these components are based on reports made by officers during the 2-week period of March 1 through March 14. Figures from these reports were multiplied by 26 to provide an annual estimate. It is recognized that this time period may or may not be representative for the year.

For the added off-duty activity component provided by the Home-Fleet plan, all officers assigned Home-Fleet vehicles were asked to complete "Off-duty Supplement" reports for all police/general assistance activities in which they participated.

For the visibility component provided by the Home-Fleet plan as against a pool plan, patrol officers and commanders were asked to record daily at roll-call the number of hours their vehicle was moving or parked away from their residence (e.g., at shopping centers, assisting an on-duty officer, etc).

### RESULTS AND DISCUSSION

#### All Pool Plan for Lexington

Table 1 indicates that an all pool plan for 80 cars with 460 cubic inch engines would cost taxpayers over a 3-year period, FY1977 through FY1979, \$1,549,412. Special attention should be given to the Total Operating Cost in Table 1--\$907,692.

In the event that Lexington decides to change to an all pool plan with cars containing somewhat smaller engines, Table 2 reflects that for the same 3-year period the Overall Total Cost would be less by \$25,692. The car under consideration in Table 2 is a Dodge Monaco with a 400 cubic inch engine.

Of particular note in Table 1 and Table 2 is a comparison of the 3-year Total Operating Cost of the cars with 460 cubic inch engines (\$907,692) and those with 400 cubic inch engines (\$633,120). An all pool plan utilizing cars with 400 cubic inch engines would cost \$274,572 less to operate over the 3-year period.

#### Home-Fleet Plan for Lexington

In the analysis of Home-Fleet costs, two annual replacement schedules were considered as shown in Tables 3 and 4. Over the 3-year period, there would be little difference in Overall Total Cost (approximately \$8,000) regardless of the schedule selected.

Looking at the slightly less expensive replacement schedule shown in Table 4, it was found that over the 3-year period the Home-Fleet would cost a total of \$1,837,285. This figure represents a cost of \$287,873 more than the pool plan which utilizes cars with 460 cubic inch engines, Table 1. It should be noted, however, that the Total Operating Cost for the entire 3-year period for the Home-Fleet was based upon the 440/460 cubic inch engine vehicles which the department presently maintains. As a result, future operating costs of the Home-Fleet plan are probably overstated--since over the next 3-year period approximately half of the Home-Fleet vehicles would be the 350 cubic inch size.

Logically, the question arises as to how much of a reduction the acquisition of 350 cubic inch cars would entail. At this point, the amount of reduction from 460 to 350 cubic inch cars is in the realm of an educated guess. As stated above, from Tables 1 and 2 we know that changing from a 460 cubic inch engine to a 400 cubic inch engine in all pool plans for 80 vehicles results in savings of \$274,572 for operating costs.

#### Additional Components of Home-Fleet

Off-duty patrol activity. During the 2-week period, all officers assigned Home-Fleet vehicles recorded their off-duty activities. It was found that they were involved in 63 separate activities as follows:

<u>Kind of Activity</u>	<u>Number of Instances</u>
Motorist Assist	25
Officer Assist	12
Traffic Arrest/Citation	9
Vehicle/Subject Investigation	9
Accident or Other Investigation	4
Family Trouble/Assist	2
Other Arrest/Citation	2
	<u>63</u>

Eighty percent of these activities were self-initiated. On the basis of these data, it was estimated that off-duty officers would be involved in 1,638 activities during the course of a year.

Visibility. Data for the visibility factor for the 2-week period indicated that off-duty patrolmen and patrol commanders were either driving their vehicles or the vehicles were parked away from their residences for a total of 4,968 hours. Therefore, it was estimated that during the course of a year off-duty patrol personnel would either be driving their patrol vehicles or they would be parked away from residences for a total of 129,168 hours. Whether or not this outcome could be generalized to other bureaus with Home-Fleet vehicles cannot be determined.

As indicated in the Introduction, the value of added visibility to police departments and to the community remains to be determined.

Other widely assumed components of a Home-Fleet plan such as officer morale and perceptions of citizens and businessmen could not be measured within the scope of the present report. Additional research will be necessary to determine a more accurate picture of the overall benefits of a take-home police car plan.

#### SUMMARY

A study was made at the Lexington-Fayette Urban County Police Department for the purpose of analyzing costs and components of the Home-Fleet plan. Three kinds of data were presented for comparison: 1) total purchase and operating costs for a 3-year period for a hypothetical all pool car plan, 2) total purchase and operating costs for a 3-year period for continuation of the Home-Fleet plan, and 3) additional components of the Home-Fleet plan. At first glance, the dollars and cents cost comparison of Home-Fleet versus all pool plans for a 3-year period indicated that the Home-Fleet would be more costly by an estimated \$288,000. However, when smaller engine size is taken into account this added cost figure may be considerably decreased. Additionally, it was found that the Home-Fleet plan provides citizens annually with off-duty police activity, estimated at 1,600 separate incidents, for such events as motorist assist, officer assist, and accident investigation. Results for the visibility data indicated that off-duty Home-Fleet vehicles are on-the-street or parked publicly for an estimated 130,000 hours annually.

This report does not attempt to intensively evaluate impact of the Home-Fleet plan on such variables as crime rate, citizen attitudes, disaster services, etc.

TABLE 1  
 COST FOR ALL POOL PLAN WITH 100%  
 ANNUAL REPLACEMENT: 460 CU. IN. VEHICLE

	<u>CY1975</u>	<u>FY1977</u>	<u>FY1978</u>	<u>FY1979</u>	<u>3 Year Total</u>
Vehicle Purchase <sup>1</sup> (80)		\$381,040	\$381,040	\$381,040	
Vehicle Sale <sup>2</sup>		101,400 <sup>(169)</sup> <sub>HF</sub>	200,000 <sup>(80)</sup> <sub>Pool</sub>	200,000 <sup>(80)</sup> <sub>Pool</sub>	
Net Purchase Cost		\$279,640	\$181,040	\$181,040	\$641,720
Operating Cost <sup>3</sup>	\$289,284				
Insurance	13,280				
Total Operating Cost	\$302,564	\$302,564	\$302,564	\$302,564	\$907,692
<b>Total Cost</b>		<b>\$582,204</b>	<b>\$483,604</b>	<b>\$483,604</b>	<b>\$1,549,412</b>

Government procurement price for 1 Ford 460 with police package is \$4,763.

The resale value of L-FUC PD 1973 model cars (N=169) was estimated to be \$600 each for FY1977. This estimate was obtained from new car dealers. The resale value of a one year old Ford 460 (N=80) was estimated to be \$2,500. This estimate was obtained from new car dealers.

This figure was calculated from 2 sources:

- 1) Total on-duty miles for Patrol Bureau for calendar year 1975: 1,738,700.
- 2) Operating cost per mile for 1974 Plymouth Fury patrol vehicles for calendar year 1975, Lincoln, Nebraska PD.

TABLE 2  
 COST FOR ALL POOL PLAN WITH 100%  
 ANNUAL REPLACEMENT: 400 CU. IN. VEHICLE

	<u>CY1975</u>	<u>FY1977</u>	<u>FY1978</u>	<u>FY1979</u>	<u>3 Year Total</u>
Vehicle Purchase <sup>1</sup> (80)		\$464,000	\$464,000	\$464,000	
Vehicle Sale <sup>2</sup>		101,400(HF <sup>169</sup> )	200,000(Pool <sup>80</sup> )	200,000(Pool <sup>80</sup> )	
Net Purchase Cost		\$362,600	\$264,000	\$264,000	\$890,600
Operating Cost <sup>3</sup>	\$197,760				
Insurance	13,280				
Total Operating Cost	\$211,040	\$211,040	\$211,040	\$211,040	\$633,120
<b>Overall Total Cost</b>		<b>\$573,640</b>	<b>\$475,040</b>	<b>\$475,040</b>	<b>\$1,523,720</b>

Purchase cost for 1 Dodge Monaco 400 with police package is \$5,800. This figure was obtained from a Dodge dealer.

The resale value of L-FUC PD 1973 model cars (N-169) was estimated to be \$600 each for FY1977. This estimate was obtained from new car dealers. The resale value of a one year old Dodge Monaco 400 (N=80) was estimated to be \$2,500. This estimate was obtained from new car dealers.

This figure was calculated from 2 sources:

- 1) Total on-duty miles for Patrol Bureau for calendar year 1975: 1,738,700.
- 2) Operating cost per mile for 1975 Dodge Monaco patrol vehicles for calendar year 1975, Lincoln, Nebraska PD.

TABLE 3  
 COST FOR HOME-FLEET PLAN WITH  
 1/4, 1/4, 1/2 ANNUAL REPLACEMENT: 350 CU. IN. VEHICLE

	<u>CY1975</u>	<u>1/4 FY1977</u>	<u>1/4 FY1978</u>	<u>1/2 FY1979</u>	<u>3 Year Total</u>
Vehicle Purchase <sup>1</sup>		\$178,794	\$178,794	\$361,845	
Vehicle Sale <sup>2</sup>		25,200 <sup>(42)</sup> <sub>HF</sub>	16,800 <sup>(42)</sup> <sub>HF</sub>	17,000 <sup>(85)</sup> <sub>HF</sub>	
Net Purchase Cost		\$153,594	\$161,994	\$344,845	\$660,433
Operating Cost <sup>3</sup>					
Gas	\$163,576				
Inside Maintenance	101,239				
Inside Labor	87,030				
Outside Repair	15,185				
Insurance	28,054				
Total Operating Cost	\$395,084	\$395,084	\$395,084	\$395,084	\$1,185,252
Overall Total Cost		\$548,678	\$557,078	\$739,929	\$1,845,685

Government procurement price for 1 intermediate vehicle with police package is \$4,257.  
 The number of vehicles purchased each year is equal to the number sold.

The resale value of L-FUC PD 1973 model cars was estimated to be \$600 each for FY1977, \$400 each for FY1978, and \$200 each for FY1979. These estimates were obtained from new car dealers.

Actual cost for Home-Fleet for calendar year 1975.

TABLE 4

COST FOR HOME-FLEET PLAN WITH  
1/3, 1/3, 1/3 ANNUAL REPLACEMENT: 350 CU. IN. VEHICLE

	<u>CY1975</u>	<u>1/3 FY1977</u>	<u>1/3 FY1978</u>	<u>1/3 FY1979</u>	<u>3 Year Total</u>
Vehicle Purchase <sup>1</sup>		\$238,392	\$238,392	\$242,649	
Vehicle Sale <sup>2</sup>		33,600 <sup>(56)</sup> <sub>HF</sub>	22,400 <sup>(56)</sup> <sub>HF</sub>	11,400 <sup>(57)</sup> <sub>HF</sub>	
Net Purchase Cost		\$204,792	\$215,992	\$231,249	\$ 652,033
Operating Cost <sup>3</sup>					
Gas	\$163,576				
Inside Maintenance	101,239				
Inside Labor	87,030				
Outside Repair	15,185				
Insurance	28,054				
Total Operating Cost	\$395,084	\$395,084	\$395,084	\$395,084	\$1,185,252
Overall Total Cost		\$599,876	\$611,076	\$626,333	\$1,837,285

Government procurement price for 1 intermediate vehicle with police package is \$4,257.  
The number of vehicles purchased each year is equal to the number sold.

The resale value of L-FUC PD 1973 model cars was estimated to be \$600 each for FY1977,  
\$400 each for FY1978, and \$200 each for FY1979. These estimates were obtained from new  
car dealers.

Actual cost for Home-Fleet for calendar year 1975.

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