

A PLAN FOR
IMPROVING THE MAINTENANCE OPERATION
AT THE MUNICIPAL GARAGE

PREPARED FOR
CITY OF PROVIDENCE

NOVEMBER 1972



Peat, Marwick, Mitchell & Co.

PEAT, MARWICK, MITCHELL & Co.

CERTIFIED PUBLIC ACCOUNTANTS

40 WESTMINSTER STREET

PROVIDENCE, RHODE ISLAND 02903

November 24, 1972

IN CITY COUNCIL

DEC 7 - 1972

CONFIDENTIAL

The Honorable Joseph A. Doorley, Jr.
Mayor of Providence
City Hall
Providence, Rhode Island

READ:

WHEREUPON IT WAS ORDERED THAT
THE SAME BE FILED.

Vincent Vignola
CLERK

Dear Mayor Doorley:

Peat, Marwick, Mitchell & Co. (PMM&Co.) has completed its engagement to review the maintenance and repair operations at the City of Providence's Municipal Garage. This letter summarizes our objectives and approach, outlines our most significant findings, and presents our major recommendations, all of which are described in detail in the accompanying report. Many of the findings and recommendations were reported on September 1, 1972 in PMM&Co.'s oral presentation to a Committee consisting of the:

- . Commissioner of Public Safety
- . Director of Public Property
- . Chief of the Police Department
- . Chief of the Fire Department
- . Director of Communications
- . Maintenance Superintendent of the Fire Department

Objectives and Approach

PMM&Co.'s study focused on three specific aspects of the maintenance and repair operation at the Municipal Garage and aimed towards achieving the following objectives:

- To review expenditures and identify areas of potential savings;
- to determine Police vehicle availability patterns and establish a corresponding preventive maintenance program;
- to investigate and improve current maintenance and repair procedures.

To accomplish these objectives, PMM&Co. observed maintenance operations, analyzed pertinent records, controls, policies, and procedures, and studied vehicle utilization and availability.

Summary of Findings

The results of PMM&Co.'s review led to the conclusion that present operations at the Municipal Garage are costly and inefficient. In the opinion of PMM&Co. the rising costs and poor service result from divided responsibility, ineffective supervision, improper utilization of personnel, and excessive contract work. PMM&Co. based this conclusion on the following observations.

- The Supervisor of the Municipal Garage and the Coordinator of the Police Department share the responsibility for Police vehicle maintenance. The Director of Public Property has too many other demanding duties to devote sufficient time to exercising effective executive direction over the Municipal Garage. The Garage lacks a qualified, capable person to supervise personnel and maintenance.
- Too much repair work is contracted out, resulting in higher costs and lower efficiency.
- Production control techniques are not utilized. Status reports are not issued on long-term repair jobs. No final inspections are made to check the quality of work performed.
- Personnel control procedures are lacking.
- Planning for and scheduling repair jobs is inadequate.
- Lack of a preventive maintenance program results in excessive emergency repairs.
- The vehicle record-keeping system is incomplete and therefore does not provide a basis for management reports.
- Damaged or obsolete vehicles occupy needed parking space.
- Vehicle utilization is poorly managed.

Recommendations

Based on the results of its study, PMM&Co. developed several recommendations in the five (5) following areas:

To Improve Organization

- Consolidate maintenance and repair operations and assign responsibility for maintaining the 139 Police vehicles to the Fire Department. In addition, PMM&Co. recommends assigning responsibility for maintaining the 52 vehicles belonging to 21 other Departments to the Highway Department. These transfers would eliminate the Municipal Garage's organizational function, while transferring maintenance responsibility to better qualified organizations. Such a consolidation will result in greater efficiency, less duplication, improved control, reduced costs, and improved service.
- Transfer the eleven (11) City employees currently assigned to the Municipal Garage as follows: five (5) to the Fire Department, five (5) to the Highway Department, and one (1) to the Office of the Commissioner of Public Safety to maintain accounting records. In addition, PMM&Co. recommends that the Coordinator of vehicles in the Police Department be transferred to the Fire Department to assume the duties of Assistant Superintendent for maintenance of Police vehicles.
- Establish formal training programs for the City's mechanics. Develop and schedule refresher safety and operation training programs on a regular basis for all vehicle operators as part of their normal work program.

To Improve Operations

- Curtail the use of outside contractors to perform routine repairs and maintenance. PMM&Co. conservatively estimates that at least one-half of the outside contract work could be performed in-house by current City personnel for a resultant savings of approximately \$40,000.
- Adopt the policy of maintaining spare tires in Police vehicles and requiring their operators to change flat tires themselves instead of calling in an outside contractor. This policy would be consistent with the practices in effect in some other New England Police Departments.
- Establish and adhere to preventive maintenance schedules in accordance with guidelines published by automobile manufacturers.

- Institute production control techniques and procedures.
 - . Plan maintenance work.
 - . Estimate time and cost for all maintenance and repair jobs.
 - . Use industry service labor time standards to plan, control, and evaluate performance.
 - . Inspect jobs upon completion.
 - . Assign a full day's work to each mechanic.
 - . Maintain records of planned and actual time and cost for repair jobs.
- Redistribute the accounting records and purchase order responsibility from the Municipal Garage to the Fire and Highway Departments. Dissolve the revolving fund and discontinue the practice of charging the Police Department 5% for administrative handling and processing.
- Institute a one-write vehicle record-keeping system for Police Department vehicles. Maintain car history ledgers and a transaction journal to assist in controlling preventive maintenance and to serve as a basis for preparing management reports. Record mileage at the time of maintenance and repair work.
- Design and implement a management reporting system. Prepare daily status reports, monthly statistical repair reports, quarterly reports of vehicles and equipment, and annual reports of maintenance and repair operations. Provide management with feedback and information for decision-making.
- Redistribute equipment and the parts inventory from the Municipal Garage to the Fire and Highway Departments.

To Improve Vehicle Utilization

- Establish and operate five (5) modified Police vehicle pools. Create two new positions for Dispatchers to control Police vehicles and improve utilization.
- Reduce the number of vehicles assigned to the Police Department by seven (7). Standardize vehicle markings and equipment within each of the pools.
- Reduce the number of vehicles assigned to other Departments and instead reimburse City officials for the use of their private vehicles on a mileage basis.

For Space Utilization

- Consider the five (5) elements of working space, support space, equipment, renovations, and parking and storage areas in transferring Police vehicle maintenance from Ernest Street to Bucklin Street.
- Plan for Fire Department repairs to be located in the front, and Police Department repairs in the back, of the Bucklin Street Garage, but allow flexibility between the two working areas.
- Determine which parts currently at the Ernest Street Garage will be transferred to the parts room at Bucklin Street, disposing of some and transferring others to the Highway Department. Use the Fire Department's support space more efficiently and create an area for parts storage out of the existing locker and desk area.
- Modify existing structures at Bucklin Street (i.e., remove partitions, reposition entry doors, etc.) to provide adequate space for vehicle repair.
- Install equipment necessary for the maintenance operation at Bucklin Street.
- Modify the Ernest Street Garage to accommodate the transfer of the Communications Department from the Bucklin Street Garage.
- Improve the present parking situation at LaSalle Street by fencing in the outside parking lot, assigning and marking spaces, exploring parking arrangements for employees, instituting a one-way traffic flow, and controlling vehicles that use the parking facilities.

To Implement PMM&Co.'s Recommendations

- Appoint an Implementation Committee.
- Designate an Implementation Project Coordinator.
- Specify a time for completion of the transfer of responsibility.

PMM&Co. believes that these recommendations can be implemented by City officials with minimal capital outlay; in fact, many (e.g., production control procedures) can be accomplished without any expenditure. Implementation should be initiated before the suggested

renovations to the existing repair facilities are completed.

As the figures on which PMM&Co. based many of its findings were obtained from unaudited, incomplete Municipal Garage vehicle records, PMM&Co. cannot assure that the statistical information included in the report is exact. However, the conclusions drawn are believed valid, as the comparative information the records contained was adequate for purposes of this study.

The following report describes PMM&Co.'s findings and recommendations in greater detail.

* * * * *

PMM&Co. appreciates the cooperation extended by the City's employees who were involved in the study. We believe that the information contained in this report will assist the City of Providence in improving its maintenance operation at the Municipal Garage.

Very truly yours,

Peat, Marwick, Mitchell & Co.

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I. INTRODUCTION

Earlier this year, PMM&Co. conducted a preliminary analysis of the repair and maintenance operations at the City of Providence's Municipal Garage. That analysis indicated a pattern of rising costs and an increasingly questionable level of service. Within the past year, these problems were compounded by the continued operation of approximately 40 Police vehicles which had been driven in excess of 100,000 miles. The cost of maintaining these vehicles rendered their operation uneconomical. These factors led the Mayor of Providence to initiate an independent review of the operating procedures and internal controls in practice at the Municipal Garage. This review focused on the maintenance performed at the Municipal Garage on the 191 vehicles assigned to the Police and 21 other Departments.

STUDY OBJECTIVE

The objective of this study was to develop action-oriented recommendations to improve vehicle maintenance operations at the Municipal Garage. PMM&Co.'s three major concerns were:

- . to review recent and current expenditures and identify areas of potential savings;
- . to determine the number of Police vehicles available for maintenance at specific times; and
- . to develop recommendations to improve the maintenance and repair procedures currently practiced.

At the outset of the study, reviews of the inventory and accident reporting systems were also considered; however, after brief reviews, PMM&Co. determined that these aspects were of minor concern in relation to the overall study.

APPROACH

To meet the objectives outlined above, PMM&Co. studied each major area in detail in the following manner:

- . We reviewed recent and current expenditures, and evaluated cost controls and the cost of contracted repair services in order to identify areas of potential savings.

- . We conducted a 24-hour utilization study of the 139 vehicles assigned to the Police Department in order to compare the number of vehicles assigned to the number of vehicles actually utilized. By evaluating the resultant "available but not used" data, we determined the number of vehicles available for maintenance during various time periods, and measured the extent of vehicle utilization.
- . We analyzed the maintenance operation, concentrating on labor controls, repair policies, vehicle record-keeping procedures, and space requirements.

II. DESCRIPTION OF THE PRESENT OPERATION

The Municipal Garage is responsible for maintaining approximately 191 vehicles, 139 of which are assigned to the Police Department, and 52 of which are assigned to 21 other City Departments. The Municipal Garage operated on a revolving fund budget of \$165,000 in fiscal year 1971-72.

The major portion of these funds, approximately \$86,000, was paid to more than 20 local garages for 1,000 contract maintenance and repair jobs. The City's Director of Public Property is currently responsible for the operation of the Municipal Garage. The building which physically houses the Garage is located at Ernest Street, and is shared with the Highway, Recreation and Police Departments. Those employees primarily concerned with maintaining the City's vehicles, are as follows:

- . Supervisor;
- . Vehicle Records Clerk;
- . Stockman;
- . Accounting Clerk;
- . Gas Pump Attendant;
- . Building Attendant;
- . Tire Man;
- . Chief Mechanic; and
- . Mechanics (3).

In addition, the Police Department has assigned one man to act as overall coordinator responsible for maintenance of the Police vehicles.

POLICE DEPARTMENT VEHICLES

The Police Department has 139 vehicles: 100 sedans, mostly Chevrolets and Fords; 7 trucks; 7 station wagons; and 25 motorcycles and Cushman carriers. In August 1972 the Department purchased 50 1972 Ford brown patrol cars and sold its 1969 and 1970 Ford blue patrol cars. More than 90% of the Department's vehicles have been purchased within the last five years, 1968 to 1972.

Based on the Municipal Garage's past records, PMM&Co. estimates that the Police vehicles traveled a combined distance of between 2.0 and 2.4 million miles, with the average vehicle

traveling between 20,000 and 24,000 miles during fiscal year 1971-1972. However, some special vehicles, such as the riot truck and the security van, traveled only a few miles. Even within the sedan group, the mileage distribution is uneven; some patrol cars traveled 36,000 miles, while others traveled only 12,000 miles. The average maintenance cost exceeded \$1,000 per vehicle in 1971-72.

Because the vehicle records did not contain mileage postings during maintenance periods, PMM&Co. did not analyze costs further.

VEHICLES FOR OTHER CITY DEPARTMENTS

In addition to maintaining the Police vehicles, the Municipal Garage services 52 vehicles for 21 other City Departments. These Departments and their respective approximate numbers of vehicles are as follows:

<u>Department</u>	<u>Number of Vehicles</u>
Air Pollution Control	1
Bath House	1
Building Inspector	1
Bureau of License	1
Citizens Planning	1
City Collector	1
City Sergeant	1
Civil Defense	1
Electrical Inspector	3
Executive	1
Head Start	2
Model Cities	5
Municipal Garage	1
North Burial Ground	4
Planning	4
Plumbing Inspector	3
Public Welfare	2
Recreation	16
SELAP	1
Social Service	1
Weights and Measures	<u>1</u>
TOTAL	<u>52</u>

Based on information derived from the existing vehicle records, and certain assumptions (e.g., the number of miles per gallon of gas), PMM&Co. prepared the following estimates, which are intended to provide operational guidance only.

- . The Recreation and North Burial Ground Departments operate 20 large vehicles, e.g., dump trucks, pick-up trucks, jeeps, trailers and a tractor. The remaining 19 Departments operate 32 other vehicles, which are mostly Chevrolet and Ford sedans.
- . The average age of each vehicle is approximately 4.5 years.
- . The average total mileage per vehicle is approximately 27,500 miles. The average yearly mileage per vehicle is approximately 6,000 to 9,000 miles.
- . The composite maintenance cost for these vehicles for repairs, space rental, lubricants and tires was approximately \$16,510, an average of \$318 per vehicle, in fiscal year 1971-72. The cost varied, however, by Department and by the vehicle's type, condition and age. The average maintenance cost per vehicle was \$527 for the 16 Recreation Department vehicles, \$312 for the 5 North Burial Ground vehicles, and \$210 for the 32 other vehicles in the remaining 19 Departments.
- . Total gasoline costs for these vehicles amounted to approximately \$9,137, or \$176 per vehicle. The City pays a bulk purchase rate of approximately \$.20 per gallon for 880 gallons per vehicle.
- . Total operating costs amounted to approximately \$494 per vehicle for these 52 vehicles in fiscal year 1971-72. Assuming a \$3,000 current replacement value for most of the vehicles, and a 4.5 year average life, the annual allowance for replacement cost would amount to approximately \$667. When combined with the \$318 maintenance cost and the \$176 gasoline cost, the annual operating cost for each of these vehicles reaches a total of \$1,161.
- . Assuming that each vehicle is driven between 6,000 and 9,000 miles per year, the following charges apply on a cents-per-mile-basis:

<u>Cost Category</u>	<u>Total Costs</u>	<u>Cents-per-mile</u>	
		<u>@ 6,000 miles</u>	<u>@ 9,000 miles</u>
Maintenance	\$16,510		
Gasoline	9,137		
Subtotal - Operations	25,647		
Estimated Replacement Cost	<u>34,684</u>		
Total Approximate Operating Cost for 52 Vehicles	<u>\$60,331</u>		
Approximate Cost/Vehicle	\$ 1,161	\$.193	\$.128

Using the midpoint on the range, 7,500 miles per year, total operating costs are approximately \$.16 per mile for maintenance, gasoline, and replacement.

As the figures on which PMM&Co. based many of its findings were obtained from unaudited, incomplete Municipal Garage vehicle records, PMM&Co. cannot assure that the statistical information included in the report is exact. However, the conclusions drawn are believed valid, as the comparative information the records contained was adequate for purposes of this study.

III. SUMMARY OF PMM&CO.'S FINDINGS

Based on observation and analysis, PMM&Co. concluded that the maintenance operations should be improved for the following reasons:

- . The Director of Public Property has several other time-consuming responsibilities which preclude his exercising effective executive direction over the Municipal Garage. Operating responsibility for maintaining the Police vehicles is presently divided between the Supervisor of the Municipal Garage and the Coordinator of the Police Department; the former controls personnel, while the latter controls the vehicles. The Municipal Garage operation lacks a qualified, capable person to supervise garage personnel and maintenance.
- . Too much repair work is presently contracted out; if it were performed by municipal mechanics, costs would be lower, efficiency greater, and better maintenance control ensured.
- . Production control techniques, such as estimating procedures and work standards, are not used. No provisions have been made to issue status reports on long-term repair jobs. Once the repairs have been completed, there is no final inspection of the work to check its quality.
- . Personnel control procedures, necessary to ensure that personnel arrive on time and work a full day, are lacking.
- . Planning for repair jobs is inadequate. Little or no attempt has been made to coordinate the availability of mechanics and cars to be serviced; under the present arrangement, most of the maintenance and repair work is scheduled during the day shift, when the fewest cars are available for maintenance.
- . The lack of a preventive maintenance system increases the number of repairs that are classified as "emergency".
- . The vehicle record-keeping system is incomplete; critical information, such as mileage, is not available for evaluation, and no management reports are prepared from

the existing records. The Police Department maintains duplicate records for its own protection.

- . Damaged or obsolete vehicles are not disposed of immediately and thus occupy much needed parking space.
- . The number of available vehicles leads to less than optimal vehicle utilization. Based on estimates of driving mileage, certain vehicles in the Police and several of the 21 other Departments are not fully utilized.

In summary, PMM&Co. attributes the rising costs and poor service primarily to: divided responsibility; ineffective supervision; improper utilization of personnel; and excessive contract work.

IV. RECOMMENDATIONS TO IMPROVE ORGANIZATION

This section of the report contains PMM&Co.'s observations and recommendations concerning responsibility for vehicle maintenance, alternative organizational arrangements, personnel, organization of the Division of Public Safety, and training.

RESPONSIBILITY FOR VEHICLE MAINTENANCE

Responsibility for the maintenance and repair of Police vehicles is divided between Providence's Director of Public Property and a representative of the Police Department. Even though the vehicles are assigned to the Police Department, the City's Director of Public Property manages the maintenance operation at the City's Municipal Garage. This organizational arrangement has proven ineffectual, as other time-consuming duties prevent the City's Director of Public Property from devoting sufficient time to this repair operation. Moreover, the current supervision of the Municipal Garage, in our opinion, is not as effective as it could be.

The Police Department is dissatisfied with the present arrangement, as the lack of maintenance has resulted in rising repair costs and poor service.

As maintenance of the City's several hundred vehicles is a major task, the Municipal Garage is but one of four Departments that perform similar operations in five locations, i.e., the Water Department; the Fire Department, within the Division of Public Safety; and the Highway, Sanitation, and Heavy Equipment Departments, within the Division of Public Works. City officials agreed to transfer responsibility for maintenance of the 50 newly acquired Police sedans from the Municipal Garage to the Fire Department, located at the Bucklin Street Garage.

Based on the results of this study, PMM&Co. recommends further consolidation of these repair operations, and the assignment of the responsibility for maintaining the remaining Police vehicles to the Fire Department. PMM&Co. additionally recommends that responsibility for maintaining the 52 vehicles belonging to the 21 other Departments be assigned to the Highway Department of the Division of Public Works. These transfers would eliminate the Municipal Garage's organizational function, while transferring maintenance responsibility to better qualified organizations. Such a consolidation will result in greater efficiency, less duplication, improved control, better utilization of personnel, reduced costs and improved service.

ALTERNATIVE ORGANIZATIONAL ARRANGEMENTS

In developing these recommendations, PMM&Co. considered the following three major alternative arrangements:

1. The Police Department could assume responsibility for maintaining its own vehicles. While this arrangement might be advantageous to the Police Department, it would prove costly for the City to create and to sustain another maintenance organization. Accordingly, PMM&Co. concluded that this alternative would be impractical.

2. Repair operations for all the City's Departments could be consolidated into one large central maintenance organization. While this arrangement might be economical, it would prove difficult to structure the physical arrangements and obtain approval from the various Departments involved. Accordingly, PMM&Co. concluded that this arrangement would be unsuitable at this time.

3. The Municipal Garage could be integrated into the Fire and Highway Departments. This arrangement offers many advantages and could be accomplished without interfering with other Departments. The City would be able to eliminate the inefficient Municipal Garage organization and place responsibility for Police vehicle maintenance with the Fire Department, within the Division of Public Safety. The transfer of Municipal Garage employees should strengthen both the Fire and the Highway Departments. The stronger management and better equipment of these Departments should improve the quality of the service provided. This arrangement would also offer flexibility in the event that the Commissioner of Public Safety chooses to establish a separate functional organization for maintenance. Accordingly, PMM&Co. recommends this organizational arrangement as the most appropriate at this time.

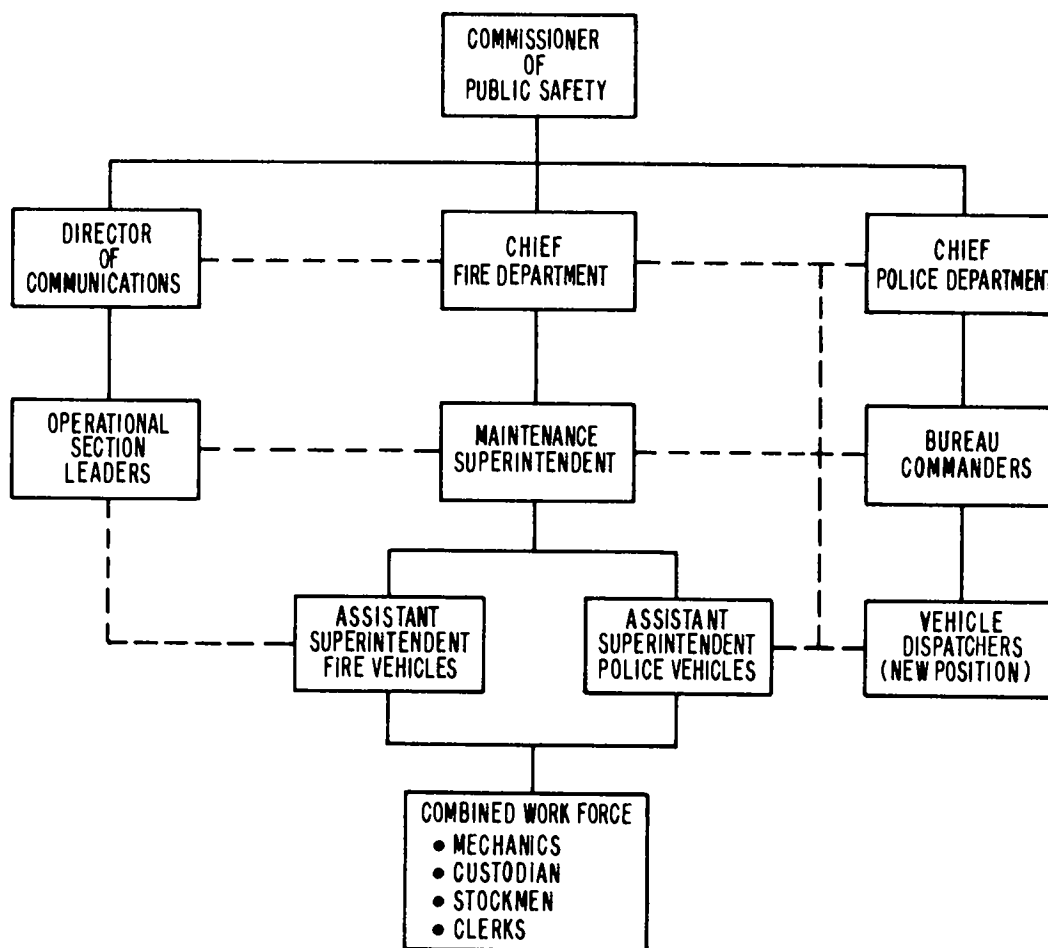
PERSONNEL

PMM&Co. recommends that the eleven City employees currently assigned to the Municipal Garage be transferred as follows: five to the Fire Department, five to the Highway Department, and one to the office of the Commissioner of Public Safety to maintain accounting records. In addition, PMM&Co. recommends that the Coordinator of Vehicles in the Police Department be transferred to the Fire Department to assume the duties of Assistant Superintendent.

These transferred personnel should be integrated into the existing organization of each Department without loss of pay, seniority, or opportunity for advancement. They should be able to handle the additional workload and to cover second and third shift operations, vacations, and absenteeism. Rather than establishing separate vehicle records and part inventories, PMM&Co. recommends that these functions and the assigned personnel be incorporated into comparable operations in the Fire and Highway Departments.

ORGANIZATION OF THE DIVISION OF PUBLIC SAFETY

Within the Division of Public Safety, PMM&Co. recommends the following personnel organization:



Under this organizational arrangement, the Chief of the Fire Department, through the Maintenance Superintendent, would be responsible for maintaining vehicles for the Communications, Fire and Police Departments. The Director of Communications and the Chief of Police would be able to deal directly with the Commissioner of Public Safety and the Chief of the Fire Department on policy matters. The Section Leaders within the Communications Department and the Operational Bureau Commanders in the Police Department would work closely with the Maintenance Superintendent of the Fire Department on operational matters. The Assistant Superintendents for Fire and Police vehicles would be in daily contact with the Shift Commanders in the Communications, Fire and Police Departments concerning operational matters. The Dispatchers in the Police Department would have primary responsibility for the preparation, positioning, and utilization of Police vehicles.

TRAINING

PMM&Co. recommends that formal training programs for mechanics be established and that safety education programs for vehicle operators be conducted more frequently.

At present, on-the-job training is the primary method of teaching the City's mechanics to maintain and repair vehicles. The driver safety education programs are informal and irregularly scheduled. As this type of training is unstructured, it can lead to the institution of inefficient or improper work methods as routine operating procedures.

PMM&Co. recommends that each mechanic attend training sessions for at least two weeks each year. Use of the fleet training programs offered by the major automotive manufacturers would provide instruction on current procedures and thereby develop increased in-house repair capability.

In addition, PMM&Co. recommends that all vehicle operators receive refresher safety and operator training on a regular yearly basis as a means of reducing vehicle abuse and accidents. This training should be scheduled as part of an employee's regular workweek.

All mechanics and support personnel should also be cross-trained to service either Fire and Police Department sedans, or Highway and Recreation Department trucks; such flexibility would increase the maintenance operation's overall efficiency.

OUTSIDE CONTRACT WORK

Name / Specialty	Police		Other Dept.		Total		%
	# In-voices	\$	# In-voices	\$	# In-voices	\$	
Ace Spring Brakes, Springs	46	2,230	6	635	52	2,865	3.3
Arnold Motors Motorcycle Repair	10	8,838	-	--	10	8,838	10.3
Atlantic Richfield Gasoline	-	--	9	778	9	778	.9
Beecroft Motors Chevrolet Repair	16	1,729	-	--	16	1,729	2.0
Boston Radiator Body Repair	56	6,833	2	199	58	7,032	8.2
Branch Towing Tire Repair, Towing	15	2,136	9	74	24	2,210	2.5
Chase Auto Body Body Repair	20	2,095	-	--	20	2,095	2.5
City Gulf Tire Repair	57	7,162	2	23	59	7,185	8.4
Custom Auto Seat Repair, Glass	83	3,736	3	101	86	3,837	4.4
Dunne Ford Ford Repair	34	4,750	1	284	35	5,034	5.9
Mullins Garage Tire Repair	17	1,729	5	45	22	1,774	2.0
Notarantonio Ford Ford Repair	24	2,967	-	--	24	2,967	3.5
Prescott H. Pierce Sirens, Domes	6	582	-	--	6	582	.7
Potters Car Wash Car Washing	-	--	37	56	37	56	-
Providence Auto Eng. Brakes, Alignment	436	25,577	4	93	440	25,670	29.9
Providence Auto Ignition Electrical Repair	12	398	8	239	20	637	.7
Quirk Tires Tires	-	--	8	1,291	8	1,291	1.5
Scanio Chevrolet Chevrolet Repair	24	3,886	-	--	24	3,886	4.6
State Body & Radiator Body Repair	28	2,917	-	--	28	2,917	3.3
Testa's Auto Body Body Repair	8	354	-	--	8	354	.4
U.S. Oil Company Oil	10	1,342	-	--	10	1,342	1.5
Miscellaneous	20	1,095	30	1,832	50	2,927	3.5
Total	922	80,356	124	5,650	1046	86,006	100.0

V. RECOMMENDATIONS TO IMPROVE OPERATIONS

This section of the report describes the following areas in which the overall maintenance operation can be improved:

- . Repair policy
- . Tire changing
- . Preventive maintenance scheduling
- . Production control
- . Accounting records
- . Vehicle records
- . Management reports
- . Replacement policy

REPAIR POLICY

In analyzing the maintenance operation, PMM&Co. reviewed the more than 5,000 work orders of the past year. Figure 1 summarizes contract repair work performed on vehicles belonging to the Police and other City Departments. As shown, more than 1,000 work orders were contracted out, costing the City more than \$86,000. This amount accounts for more than 50% of the funds appropriated to operate the Municipal Garage. The increased costs and loss of control over vehicle availability that contracting involves negates its positive convenience factor.

During the study, our consultants observed that the mechanics at the Municipal Garage were poorly utilized. Some were merely delivering and retrieving vehicles from outside contractors, while others were not scheduled for a full day's work. PMM&Co. conservatively estimates that at least half the outside contract work could be performed in-house by current City personnel, resulting in a savings of approximately \$40,000. PMM&Co. therefore recommends that the City's mechanics at the Bucklin Street repair facility handle as much maintenance and repair work as possible. Such a change in procedure would require training some of the mechanics to perform certain jobs not currently done in-house, e.g., disk brake maintenance and repair. While it would not be economically justifiable to perform all types of repair and maintenance in-house, e.g., major body repair, glass repair, etc., PMM&Co. recommends that the City aim towards developing and utilizing extensive in-house repairs and maintenance capabilities and thereby eliminate much outside contracting.

TIRE CHANGING

The Municipal Garage's current procedure is to call in a contractor in the case of a flat tire, as spare tires are not kept in Police vehicles. PMM&Co. recommends that a new policy of tire changing and repair be adopted; spare tires should be carried in the vehicles and the drivers should change flat tires. Prior to making this recommendation, PMM&Co. surveyed other New England cities to determine their tire changing policies. In Boston and Springfield, the vehicle operator is expected to change a tire at any time. In New Haven, a Patrol car operator is expected to change a flat when the Police garage is not open, whereas in Worcester a tire is changed by the Police garage when open and a private contractor when the garage is closed. Our survey of tire changing policies did not indicate that all cities require the vehicle operator to change tires, but it did note that some cities find such a policy satisfactory.

PREVENTIVE MAINTENANCE SCHEDULES

Two basic types of work are performed on Police Department vehicles at the Municipal Garage - emergency repairs and routine maintenance. The key to improving production control is to increase the percentage of maintenance work and thereby eliminate much emergency work. Although no statistics have been developed, Municipal Garage operations seem to be largely of an emergency nature, as insufficient attention is directed towards developing a sound preventive maintenance program. A workable preventive maintenance program would improve control of the overall maintenance operation by:

- . reducing costs by reducing the number of emergency repairs;
- . permitting systematic scheduling of vehicles by providing advance notice of vehicle arrival;
- . allowing direct evaluation of the overall garage operation by comparing scheduled to completed work.

Based on a review of the existing vehicle records and our observations of the lack of systemized procedures, PMM&Co. recommends that preventive maintenance schedules be established and strictly adhered to in accordance with the guidelines published by automobile manufacturers.

PRODUCTION CONTROL

During the study, our consultants noticed the complete lack of application of production control techniques. To establish an effective maintenance operation, PMM&Co. strongly recommends instituting the following production control procedures:

- . Plan and schedule maintenance and repair work on monthly, weekly, and daily bases.
- . Estimate time and cost of all maintenance and repair jobs, including those to be contracted.
- . Apply industry service labor time standards to estimate, plan, control, and evaluate work and performance. These industry standards cover the total time required to perform a repair operation, including repair time, test time, a 5% personnel allowance, and a 20% supplemental allowance for variations in age, condition, broken fastenings, delay, fatigue, and routine diagnosis.
- . Assign a full day's work to each mechanic at the beginning of the day. Expect the work to be completed by the end of the shift.
- . Inspect job orders upon completion to ensure the quality of the work performed.
- . Maintain records of planned and actual time and cost for job orders requiring more than one-half hour of applied labor.

ACCOUNTING RECORDS

The transfer of vehicle repair functions from the Municipal Garage at Ernest Street to the Bucklin Street facility will necessitate a redistribution of financial records and purchase order responsibility. Planning for the redistribution must include providing support personnel to maintain the financial records, as well as dividing those records accurately.

Accordingly, PMM&Co. recommends that one Accounting Clerk be transferred from the Municipal Garage to the Office of the Commissioner of Public Safety to maintain the Police Department's financial and purchase order records. PMM&Co. further recommends that the revolving fund for the Municipal Garage be dissolved by distributing it to the

Police and Highway Departments. PMM&Co. assumes that the additional record-keeping that will be required for the Highway Department as a result of this transfer can be handled by the existing clerical staff. Inclusion in the budget of both the maintenance cost for these additional vehicles and the Police and Highway Department appropriations will eliminate the necessity of continuing the 5% administrative handling charge and thereby save the Police Department \$5,000 each year.

VEHICLE RECORDS

The backbone of a comprehensive maintenance system is a simple but complete record-keeping system which not only maintains vehicle records, but uses them to generate management reports. Under the present system, the vehicle records are incomplete (e.g., poor mileage records) and do not produce reports to inform senior Police Department members of the status of vehicle maintenance and repair.

PMM&Co. recommends that the Police Department institute a one-write vehicle record-keeping system. One suitable system, partially detailed in Exhibits A, B and C, would contain the following records:

- . Repair Order - This record would be prepared by the Assistant Superintendent for Maintenance. It would provide space for estimating work to be completed and parts needed, as well as for showing actual work completed and parts used. It would serve as a record for both inventory and personnel control and provide instructions to mechanics. The back of the form could be used as a checklist to evaluate car safety and to schedule maintenance. Exhibit A is a sample repair order.
- . Time Sheet - This sheet is primarily designed as a personnel control record which would indicate how a mechanic has spent his time. It would be prepared by each employee and would serve as an excellent tool for evaluating and controlling the garage personnel. Exhibit B is a sample time sheet.
- . Car History Ledger - A ledger card would be created to provide operating information about each vehicle. This record would be maintained by the Vehicle Records Clerk at the garage. Properly maintained, this record would assist in maintenance scheduling and vehicle replacement decision-making. Exhibit C is a sample car history ledger.
- . Journal - The journal would be maintained by the Vehicle Records Clerk and would contain a list of all garage activity for a given day; a one-write system would automatically create this journal as car history ledger cards are prepared.

- . Patrol Car Book - This book (or Daily Vehicle Inspection Form) would serve as a statistical input to the record-keeping system, and would be kept in the Police vehicle. This form should be simple enough to facilitate accurate completion by the vehicle operator. The Daily Vehicle Inspection Form currently used by the Police Department can serve as a basic input into the one-write system and be used in place of the Patrol Car Book.

MANAGEMENT REPORTS

At present, few management reports are produced which pertain to the operation of the Municipal Garage, primarily because the vehicle record system has not been maintained. Those that are prepared deal basically with financial matters and do not include operational information. Accordingly, City officials are forced to make decisions based on insufficient information.

PMM&Co. recommends that a one-write system be implemented to simplify report generation, and thereby keep top officials informed about garage activity and efficiency. The following reports should be designed to highlight critical areas:

- . daily status reports of vehicles out of service for reasons other than routine maintenance;
- . monthly statistical repair reports for the Commissioner of Police Safety;
- . quarterly reports of vehicles and equipment to update the City of Providence's Moveable Property Inventory;
- . annual reports of maintenance and repair operations.

REPLACEMENT POLICY

At present, there is no regular replacement policy for vehicles belonging to the Police Department, which results in increased vehicle operation costs. Failure to replace a vehicle once it does not provide transportation at the least cost per mile, results in significantly increased repair costs and reduced trade-in value. Vehicle information contained in the improved vehicle record system would be a critical input into the development of a vehicle replacement policy.

PMM&Co. recommends that a tentative replacement policy be adopted to ensure that costs are not increased by maintaining uneconomically operated vehicles. This policy should be subject to revision when improved record-keeping makes supporting information available. In establishing a repair policy, the Police Department should consider the City of Boston's policy of turning in a percentage of its operating vehicles every year, with the goal of replacing all Patrol vehicles over a two year period, when a vehicle has approximately 80,000 miles and has passed its most economical operative point.

Another city in the greater Boston area reduces vehicle expenditures by replacing older vehicles in other municipal departments with cars which the Police Department can no longer use, but that are suitable for use by those other departments.

The development of a replacement policy would also aid the implementation of a Municipal Capital Improvement Program. Deliberate long-range planning of this type would result in more logical forecasts and assured satisfaction of Departmental needs.

VI. RECOMMENDATIONS TO IMPROVE VEHICLE UTILIZATION

This section of the report includes PMM&Co.'s observations and recommendations to improve vehicle utilization within the Police and 21 other Departments serviced by the Municipal Garage.

POLICE VEHICLES

Theoretically, if the Police Department used only one type of vehicle, it could operate with between 80 and 85, instead of the current 114, four-wheeled vehicles. The 30 vehicle differential is due to the requirements of different Bureaus for the following various types of vehicles:

- . Traffic vehicles
- . Patrol vehicles
- . unmarked Task Force vehicles
- . unmarked C Squad vehicles
- . unmarked Juvenile Force vehicles
- . Command vehicles
- . Detective vehicles
- . administrative and special purpose vehicles, e.g., the armorer's truck, the riot control van, and the recruiting van.

These vehicles are marked and equipped differently. Some, e.g., the Patrol cars, are used frequently, while others, e.g., the administrative, Command, and special purpose vehicles, are used infrequently. To gather sufficient information to recommend improvements in vehicle utilization, PMM&Co. compared Patrol vehicle assignments and requirements every fourth day during the past year, and conducted a one-day study during August, 1972 of the movement of vehicles at the LaSalle Street Headquarters. This study was not intended to serve as a basis for developing detailed schedules or routes for Police vehicles; instead its purpose was to sample utilization and thereby determine when vehicles are generally available for preventive maintenance.

Study Observations

Figure 2 summarizes PMM&Co.'s observations:

FIGURE 2

SUMMARY OF VEHICLE UTILIZATION
August 17, 1972
(Not Including Motorcycles or Three-Wheeled Vehicles)

<u>Bureau</u>	<u>Total Vehicles</u>			
	<u>Assigned</u>	<u>Being Repaired</u>	<u>Available But Not Used</u>	<u>On Duty</u>
Traffic	9	2	2	5
Patrol	47	6	4	37
Task Force	9	-	4	5
C Squad	5	1	-	4
Juvenile	2	-	-	2
Command	12	-	1	11
Detective	13	-	1	12
Administrative	<u>17</u>	<u>2</u>	<u>5*</u>	<u>10</u>
TOTAL	<u>114</u>	<u>11</u>	<u>17</u>	<u>86</u>

*Total consisted of 2 taxis, 1 recruiting van, 1 armored truck and 1 armorer's truck.

These figures do not include obsolete Patrol vehicles, eleven (11) of which were at LaSalle Street. During the study day, an hourly average of 48 Police vehicles were parked at the LaSalle Street Headquarters: 46 during the day shift, 45 during the evening shift, and 58 during the night shift. The least number of vehicles parked at any given time was 34, at the peak use time of 7 P.M., and the highest number was 60, at the low use time of 2 to 3 A.M. PMM&Co. assumed that the remaining vehicles, 80 at 7 P.M. and 54 at 2 to 3 A.M., were on duty throughout the City. Those numbers of available vehicles strongly suggest that substantial savings could result from the formation of vehicle pools under the control of central Dispatchers.

In reviewing vehicle utilization, the key column in Figure 2 is "Available But Not Used", which shows that on the day of observation, seventeen (17) of the one hundred and fourteen (114) vehicles assigned to the Police Department remained stationary. Taking into consideration that five (5) of these seventeen (17) vehicles (categorized "Miscellaneous") belong to the special groupings previously noted, approximately twelve (12) vehicles were actually available but not used. While these utilization figures are based on a one-day sample and do not prove conclusively that the Police Department has more vehicles than it needs, they do suggest the possibility that the Department's operating requirements could be satisfied with fewer vehicles.

Twenty-five (25) motorcycles and three-wheeled vehicles are assigned to the Traffic Bureau. These vehicles are used for Traffic Bureau work during fair weather, instead of the automobiles used during inclement weather and the winter. PMM&Co.'s around-the-clock utilization observations of August 17, 1972 included the motorcycles and three-wheeled vehicles; as Figure 3 indicates, twelve (12) of the twenty-five (25) vehicles were never used that day.

FIGURE 3

SUMMARY OF MOTORCYCLE UTILIZATION
August 17, 1972

<u>Type of Vehicle</u>	<u>Total in Department</u>	<u>Being Repaired</u>	<u>Available but Not Used</u>	<u>On Duty</u>
Motorcycles	15	-	11	4
3-Wheeled Cushmans	3	-	-	3
3-Wheeled Harley Davidsons	<u>7</u>	<u>1</u>	<u>1</u>	<u>5</u>
TOTAL	<u>25</u>	<u>1</u>	<u>12</u>	<u>12</u>

Assuming that several of the twelve (12) vehicles might originally be operated by personnel who were sick or on vacation on August 17, we recommended a further review be conducted to determine the number of motorcycles and three-wheeled vehicles actually needed by the Traffic Bureau. While these vehicles are tactically advantageous in certain situations, and are useful on special occasions (e.g., ceremonies), the total number necessary should be evaluated.

Modified Motor Pool Concept

To improve overall vehicle utilization and reduce the number of vehicles required, PMM&Co. recommends that the Police Department establish a modified motor pool instead of assigning each vehicle to a specific office in given Bureaus. Based on the estimated tactical requirements of different Bureaus and current utilization patterns, PMM&Co. recommends establishing five (5) vehicle pools, grouped as follows:

<u>Group</u>	<u>Bureau</u>	<u>Number of Vehicles Currently Assigned</u>	<u>Estimated Number of Vehicles Required</u>	<u>Estimated Potential Vehicle Savings</u>
1	Traffic	34 (including motorcycles, etc.)	32 - 33	1 - 2
2	Patrol	47	43 - 45	2 - 4
3	Task Force C Squad Juvenile	16	12 - 14	2 - 4
4	Command Detective	25	23 - 24	1 - 2
5	Administrative	<u>17</u>	<u>15 - 16</u>	<u>1 - 2</u>
	TOTAL	<u>139</u>	<u>125 - 132</u>	<u>7 - 14</u>

PMM&Co. attempted to determine the number of vehicles that should be assigned to each pool grouping. A conservative estimate of the potential savings resulting from a reduction in the total number of departmental vehicles, could be based on the assumption that seven (7) of the twelve (12) vehicles (not including

special vehicles) that remained stationary during the twenty-four (24) hour observation period are not needed. Considering the purchase prices and operating/maintenance costs for seven (7) vehicles, the potential annual savings would cover the cost of the two Dispatchers as follows:

Replacement cost of \$21,000 (7 vehicles @ a purchase price of \$3,000 and a 3 year life	\$ 7,000
--	----------

Operating and maintenance costs @ \$1,400 per vehicle	9,800
	<u>\$ 16,800</u>

Once the pools are in operation, additional savings can be realized by a further reduction in the number of vehicles, i.e., a portion of the 48 vehicles parked at LaSalle Street.

The Dispatchers' duties would be to: provide vehicles as requested; coordinate vehicle maintenance and repair with the Assistant Superintendent for Police vehicles in the Fire Department; prepare vehicles for operation, i.e., gas, oil, clean; and control vehicle parking.

The major benefits of adopting the modified pool concept would be increased control and more flexible utilization. The benefits should not involve loss of a tactical reserve. The only change necessary to establish these pools is the standardization of equipment and markings within each group.

Coordination of Vehicle Availability and Maintenance

To optimize utilization, vehicles should be serviced when they are not required for operation, rather than scheduled for service at an arbitrary time. Inasmuch as the Patrol Bureau accounts for approximately forty percent (40%) of the total number of departmental cars, based on a sample taken from official Police records on the basis of every fourth day, the utilization of Patrol vehicles was reviewed over a one year period. Figure 4 summarizes vehicle availability for maintenance by department.

FIGURE 4

MAINTENANCE AVAILABILITY MATRIX
(Does not include Motorcycles and Three-wheeled vehicles)

Shift	Bureau	Available for Maintenance			
		Total Vehicles Assigned	Monday through Friday	Saturday	Sunday
Day:					
	Traffic	9	--	--	6
	Patrol	47	23	26	26
	Task Force	9	6	6	8
	C Squad	5	--	--	3
	Juvenile	2	--	3	3
	Command	12	--	10	10
	Detective	13	--	13	13
	Administrative	<u>17</u>	<u>5</u>	<u>15</u>	<u>15</u>
	TOTAL SHIFT	<u>114</u>	<u>34</u>	<u>73</u>	<u>84</u>
Evening:					
	Traffic	9	--	--	6
	Patrol	47	--	--	--
	Task Force	9	--	--	8
	C Squad	5	--	--	3
	Juvenile	2	3	3	3
	Command	12	8	10	10
	Detective	13	11	13	14
	Administrative	<u>17</u>	<u>10</u>	<u>15</u>	<u>15</u>
	TOTAL SHIFT	<u>114</u>	<u>32</u>	<u>41</u>	<u>59</u>
Night:					
	Traffic	9	6	6	6
	Patrol	47	13	15	15
	Task Force	9	8	8	8
	C Squad	5	3	3	3
	Juvenile	2	3	3	3
	Command	12	10	10	10
	Detective	13	13	13	14
	Administrative	<u>17</u>	<u>15</u>	<u>15</u>	<u>15</u>
	TOTAL SHIFT	<u>114</u>	<u>71</u>	<u>73</u>	<u>74</u>

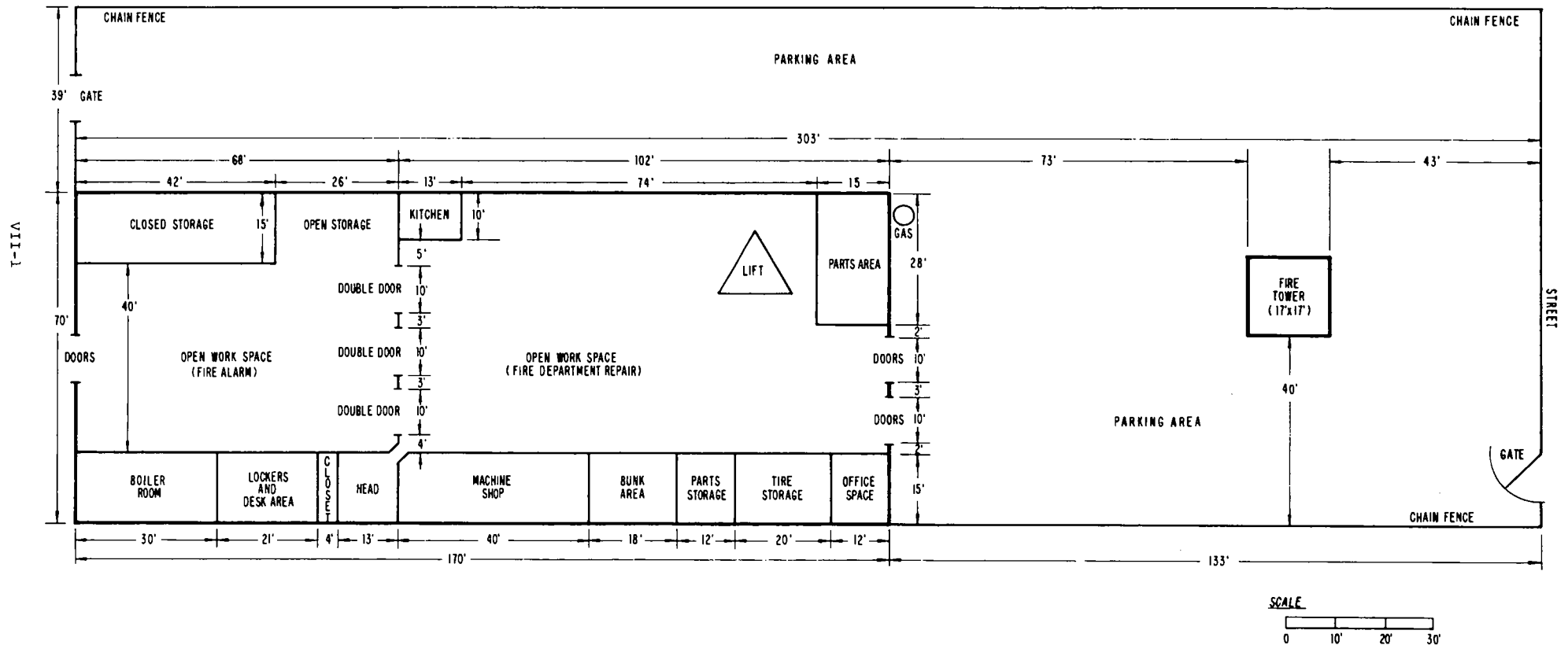
This three shift array represents a simplified matrix. In practical application, the Providence Police Department operates a fourth or swing shift between 6 P.M. and 2 A.M. However, for purposes of planning preventive maintenance, this guide is sufficiently accurate.

As Figure 4 indicates, the largest number of vehicles is available for maintenance during nights and weekends, while the smallest number is available during the Monday through Friday day and evening shifts. This availability pattern suggests that more than one maintenance shift is needed to maintain and repair the vehicles belonging to the Providence Police Department. In the past, maintenance has been available on a day shift basis for 5-1/2 days each week at the Municipal Garage. If vehicles broke down on the 2nd and 3rd shift or on Sunday, one of three(3) local garages would be contacted to retrieve and repair the vehicle. During this time period, the Fire Department has maintained a skeleton crew for emergency situations on a 3 shift basis at the Bucklin Street Garage. PMM&Co. recommends that maintenance of Police and Fire Department vehicles be combined and operated on a 3 shift basis. Whereas the present size of the Municipal Garage work force (11) is too small to provide effective 3 shift coverage, when half of this force (6) is combined with that of the Fire Department (17), the maintenance group of 23 should be of sufficient size to operate 3 shifts. Using the information provided on Figure 4, maintenance for Patrol vehicles should be handled on the day shift; for Command, Detective and administrative vehicles on the evening shift; and for Traffic, Task Force, C Squad, and Juvenile vehicles on the night shift. This should provide emergency coverage for Police vehicles during the 2nd and 3rd shifts as well as reduce the need for contract assistance significantly. In addition, the turnaround time for completion of repairs on key vehicles, which can be reduced by proper scheduling, would also improve vehicle utilization.

VEHICLES ASSIGNED TO OTHER DEPARTMENTS

Based on a review of the records maintained for the 52 other vehicles assigned to the 21 other Departments and serviced at the Municipal Garage, PMM&Co. recommends that the City improve vehicle utilization by discontinuing its practice of providing vehicles to several Departments for only limited driving. PMM&Co.'s review indicated that some vehicles travel between 6,000 and 9,000 per year, which only amounts to approximately 25 to 40 miles, or 1 to 2 hours per day. This low level of usage makes it more economical for the City to reimburse these Departments \$.12 per mile for official use of employees' private vehicles. The number of vehicles requiring maintenance would thus be reduced significantly.

FIGURE 5
BLOCK DIAGRAM OF PRESENT
GROUND AND BUILDING PLAN OF
BUCKLIN STREET REPAIR FACILITY



AS THIS DIAGRAM IS INTENDED AS A PLANNING GUIDE, THE FIGURES SHOWN ARE APPROXIMATIONS, NOT EXACT MEASUREMENTS.

VII. RECOMMENDATIONS FOR SPACE UTILIZATION

During the course of the engagement, PMM&Co. became concerned about adequate space for maintaining and parking police vehicles. We reviewed the current and anticipated space for Police vehicles at the following locations:

- . The Bucklin Street Garage, which currently handles maintenance for the Fire Department and houses vehicles for the Communications Department.
- . The Ernest Street Municipal Garage, which currently handles maintenance for the Highway Department, the Police Department and 21 other Departments, provides storage for the Recreation Department, and serves as a substation for the Police Department.
- . The LaSalle Street Building, which currently houses Headquarters for the Fire and Police Departments and serves as the major parking facility for the many Police vehicles.

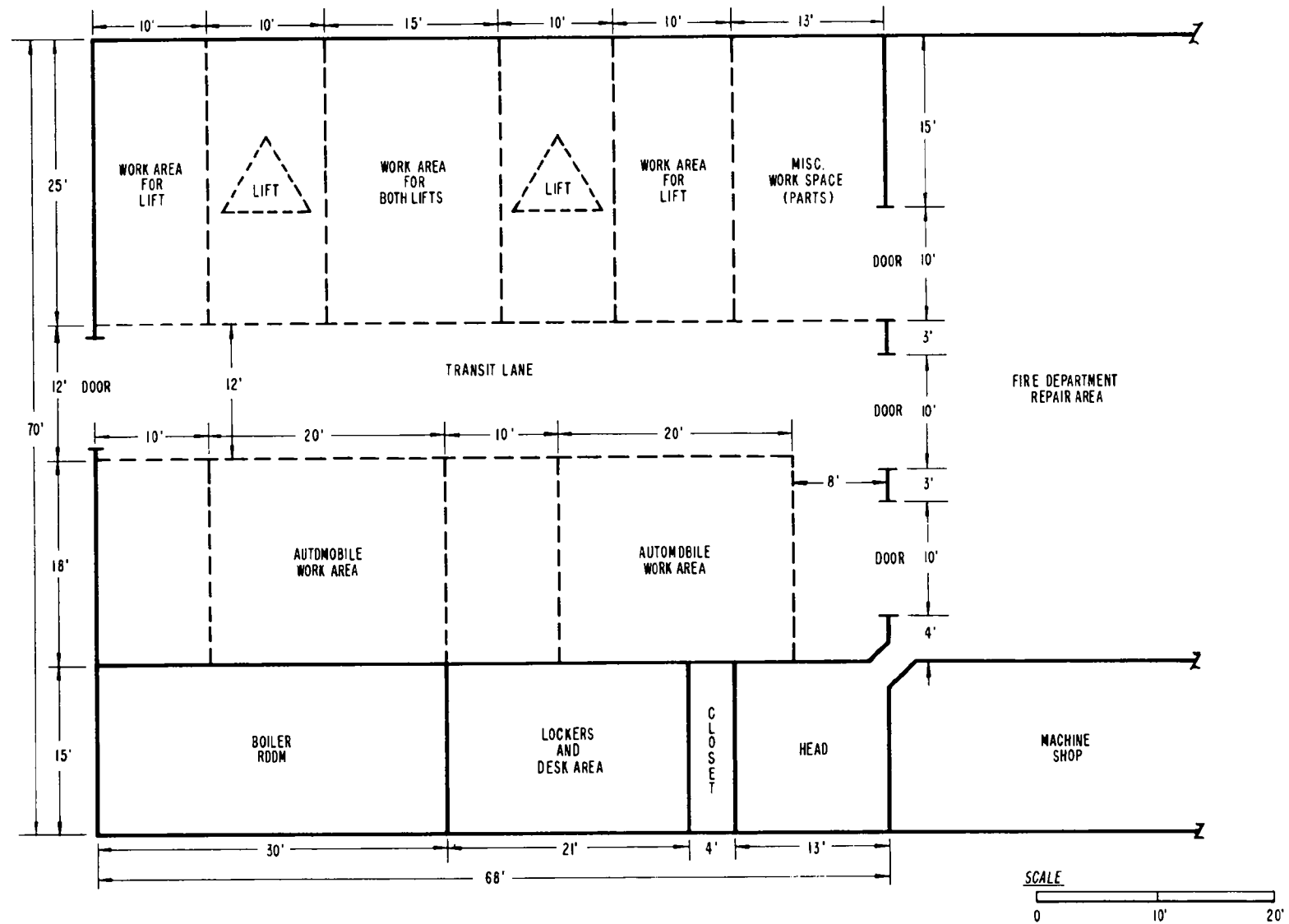
It is anticipated that maintenance of the Police vehicles will be combined with that of the Fire Department vehicles, and that the entire operation will be relocated from Ernest Street to Bucklin Street. At that time, the Communications Department will transfer from Bucklin Street to Ernest Street.

THE BUCKLIN STREET GARAGE

The decision to transfer the maintenance of Police Department vehicles from Ernest Street to Bucklin Street involves consideration of the five following elements relating to the present layout of the Bucklin Street Garage (as shown in Figure 5):

- . working space;
- . support space;
- . equipment;
- . renovations; and
- . parking and storage areas

FIGURE 6
BLOCK DIAGRAM OF SUGGESTED FLOOR PLAN
FOR POLICE DEPARTMENT REPAIR FACILITY
AT BUCKLIN STREET GARAGE



AS THIS DIAGRAM IS INTENDED AS A PLANNING GUIDE, THE FIGURES SHOWN ARE APPROXIMATIONS, NOT EXACT MEASUREMENTS.

Working Space

There are approximately 12,000 square feet of floor area at the Bucklin Street Garage. This space is currently shared by the Fire Department, which occupies about 7,200 square feet, and by the Communications Department, which occupies about 4,800 square feet. At present, about 3,100 of the building's square feet are occupied by shops, boiler rooms, toilet facilities and offices -- of which approximately 2,100 square feet are part of the Fire Department area and 1,000 square feet are part of the Communications Department area. The remaining 8,900 square feet of floor area are used as workspace for vehicles -- 5,100 square feet for the Fire Department and 3,800 for the Communications Department. Accordingly, approximately 3,800 square feet of working space are potentially available for the maintenance of Police vehicles at the Bucklin Street Garage. This square footage includes an area of 600 square feet currently used for battery storage, which would become available. Based on preliminary calculations, PMM&Co. estimates that two lift areas and two other service bays could be developed, as shown in Figure 6.

Although the present utilization plans for the Bucklin Street repair facility are based on the location of Fire Department repairs in the front of the Garage and Police Department repairs in the back, PMM&Co. recommends this separation of working areas be flexible and that both sections be available for vehicle repair by either Department, as warranted. To facilitate this arrangement, PMM&Co. recommends that the double doors in the existing partition remain open.

A substantial portion of additional work are could be gained within the existing Fire Department area if two damaged ladder trucks were stored elsewhere while awaiting funds for repair, and if the antique truck undergoing rebuilding could be completed and moved to another location.

Support Space

Parts storage and office space are needed. In evaluating the two locations potentially available for parts storage, which is the more critical requirement, it will be necessary to determine which parts currently at the Ernest Street Garage will be transferred to the parts room at Bucklin Street. Some parts at the Municipal Garage are obsolete and should be disposed of, and others should be transferred to the Highway Department. Moreover, efficient use of support space in the Fire Department's section at the Bucklin Street Garage could further reduce such space requirements. One possible area for parts storage, depicted in Figure 6, would be the area next to the boiler room, which is currently used as a locker and desk area. PMM&Co. also recommends that an adequate transit lane of about 240 square feet and 12 feet wide, be available in the center of the working area. The office space would have to be created out of the machine shop or another area.

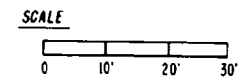
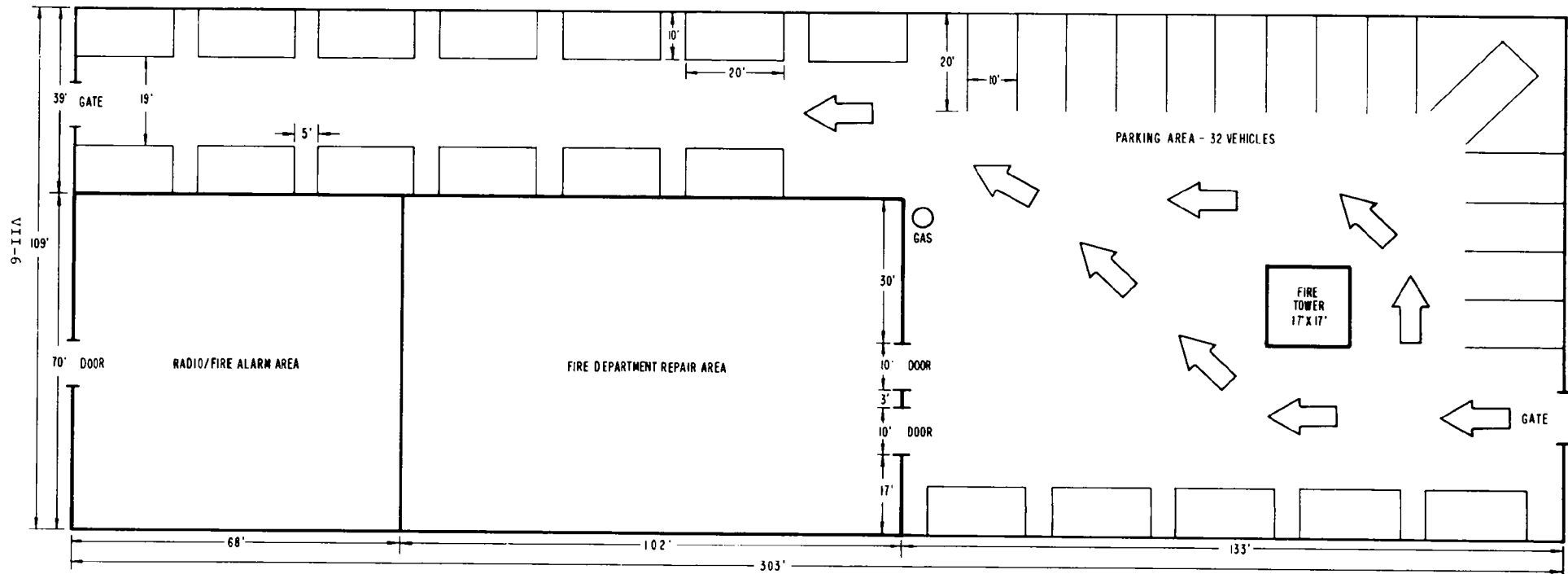
Renovations

Modifications of the existing structures at Bucklin Street to provide adequate space for vehicle repair would involve removal of the partition enclosing the present storage area, and the repositioning of entry doors to form working spaces and lift areas (subject to the physical restrictions imposed by building support columns).

As detailed cost estimates for renovations are beyond the scope of this study, they should be obtained from contractors or municipal carpenters. The following is a partial list of possible renovations and necessary equipment to make the back part of the Bucklin Street Garage a suitable repair facility:

- . removal of storage area partitions;
- . creation of a parts storage area;
- . installation of a tail-pipe exhaust system;
- . installation/improvement of lighting systems;
- . modification of doors;
- . purchase and installation of two lifts;
- . purchase and installation of two compressors; and
- . purchase of miscellaneous other equipment.

FIGURE 7
BLOCK DIAGRAM OF SUGGESTED GROUND PLAN
OF BUCKLIN STREET REPAIR FACILITY



AS THIS DIAGRAM IS INTENDED AS A PLANNING GUIDE, THE FIGURES SHOWN ARE APPROXIMATIONS, NOT EXACT MEASUREMENTS.

Parking and Storage Areas

Parking space is required for vehicles awaiting repair or pick-up after repair, and for vehicles belonging to the mechanics on duty.

On the basis of standard parking requirements, PMM&Co. estimates that the space available on the side and in front of the building could accommodate at least thirty-two (32) automobiles without interfering with traffic flow. These approximately thirty-two (32) parking spaces, however, must be shared by the Police and Fire Departments. Assignment of spaces is recommended to maximize the efficient use of the available space.

Figure 7 diagrams a possible ground plan for the Bucklin Street repair facility. PMM&Co. recommends that an ordered traffic pattern be implemented to minimize congestion in parking, entering and exiting. In addition, PMM&Co. suggests that the area on the side of the building have a one-way flow away from the fire tower, entering through the gate on Dexter Street and exiting on Bucklin Street.

Such a traffic pattern would provide an efficient method of refueling, as most vehicles have their gas caps located either on their left side or at their rear; cars could pull up directly next to the gas pump and not have to reverse direction to exit. This pattern would also allow for the installation of a second gasoline pump (for premium or regular gasoline) for Police Department vehicles.

The limited number of available parking spaces leads PMM&Co. to recommend that no vehicles be stored at Bucklin Street. Police vehicles which are essential but not regularly used (e.g. armored truck, recruiting van) should be stored at another location, ideally the basement garage at LaSalle Street. To maximize parking availability at Bucklin Street and other locations, especially LaSalle Street, all obsolete vehicles should be disposed of as quickly as possible instead of stored, pending disposal, at locations where parking spaces are in demand.

Equipment

Several pieces of equipment should be installed for the maintenance operation at the Bucklin Street Garage. The following list is not all-inclusive, but is intended to serve as a planning aid. Cost estimates are included for only those items which do not require an equipment engineer's opinion.

Automobile Lifts

Industry space standards indicate that an automobile lift occupies approximately 750 square feet, which consists of a 10x25 foot work area on each side of the lift, and a 10x25 foot area to be occupied by an automobile on the lift. Two lifts can share a common work area and thereby reduce the total space required to less than 1,500 square feet. Industry standards stipulate 1,375 square feet for two lifts being operated adjacently.

PMM&Co. recommends that two lifts be installed side by side in the repair area (as shown in Figure 6) to allow adequate lift facilities for maintenance and repair of Police Department vehicles. Consideration should be given to the type of lift installed (frame contact or drive through) to maximize the flexibility of the repair facility. The estimating costs for these lifts would be a minimum of \$1,500 for an installed frame contact lift, and somewhat more for a drive through lift.

Tail Pipe Exhaust System

An automobile fume emission system should be installed.

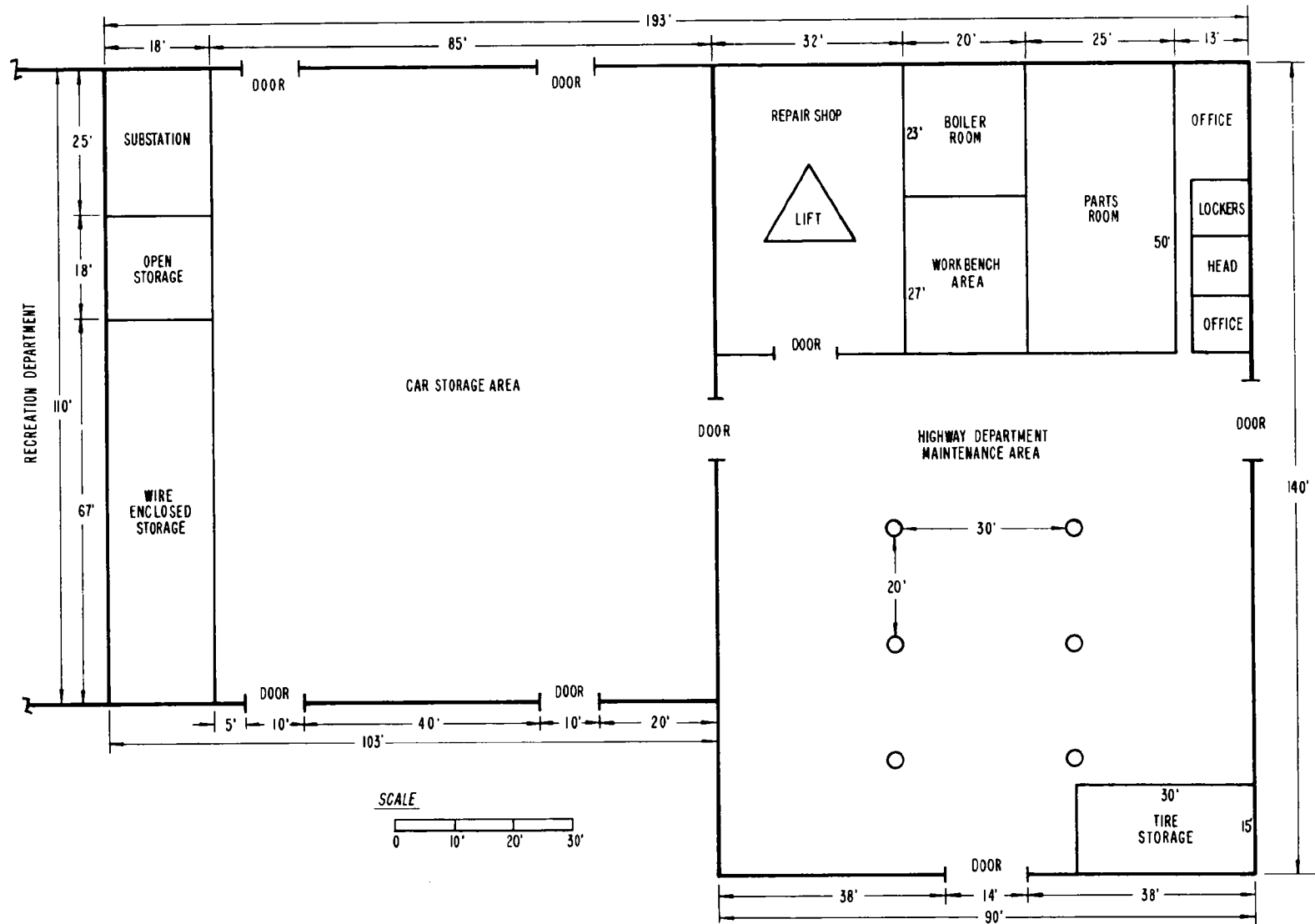
Compressor

A compressor is needed to provide air for lifts, lubrication equipment and pneumatic tools. The industry recommendations for a repair facility of this type include provision for two compressors, one for daily use and the other for back-up to ensure that compressor failure does not halt shop operation.

Lighting

The existing lighting system will have to be evaluated, especially if the repair facility will be manned on the second and third shifts.

FIGURE 8
BLOCK DIAGRAM OF PRESENT FLOOR PLAN
AT ERNEST STREET MAINTENANCE FACILITY



AS THIS DIAGRAM IS INTENDED AS A PLANNING GUIDE, THE FIGURES SHOWN ARE APPROXIMATIONS, NOT EXACT MEASUREMENTS.

Miscellaneous Equipment

A well-equipped repair shop requires other pieces of common repair equipment, such as portable floor jacks, tool kits, tire changers, pneumatic wrenches, wheel balancing/alignment equipment, and lubrication equipment.

The approximate costs for basic miscellaneous equipment would be:

Portable Floor Jack	\$ 150
Full Power Tire Changer	550
Pneumatic Wrench with Chucks	150
Bubble Type Wheel Balancer	150
Lubrication Reel with Pump	<u>300</u>

Total approximate cost of basic miscellaneous equip- ment	<u>\$1,300</u>
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THE ERNEST STREET MUNICIPAL GARAGE

As Figure 8 shows, there are approximately 24,000 square feet of floor area in the Municipal Garage at Ernest Street. This space is currently shared by the Highway Department, which occupies about 6,300 square feet, the Recreation Department, which occupies about 1,500 square feet, a Police Substation, which occupies about 450 square feet, and the Municipal Garage, which occupies approximately 15,750 square feet. While the space allocation for the Municipal Garage seems substantial, the space actually available for maintenance work only amounts to approximately 3,500 square feet. The difference between the 15,750 and 3,500 square feet, some 12,250 square feet, can be accounted for as follows: 9,350 square feet of storage area for damaged vehicles, employee parking, and storage of special police vehicles; and 2,900 square feet of a boiler room, parts room, offices, toilet facilities, and a storage area.

Modifications Required for Communications Department

The present plans for the physical relocation of the Communications Department from the Bucklin Street Garage to the Ernest Street Garage would require some modification of the latter area.

The radio group presently uses approximately 5,100 square feet at the Bucklin Street Garage for its operations; the back part of the Ernest Street Garage measures more than 9,350 square feet. Even if as much as 5,000 square feet are allocated for radio repair, the remaining 6,000 square feet could be partitioned and used by other Departments. The less frequently used special Police vehicles, the damaged ladder trucks of the Fire Department, or certain recreational equipment could be stored in this area.

These modifications should include provision for:

- . adequate security, i.e., making the back section of the garage a separate, limited access area;
- . installation/improvement of washroom facilities;
- . installation, if necessary, of adequate lighting;
- . removal of Recreation Department equipment stored in the work area;
- . removal of miscellaneous vehicles and equipment.

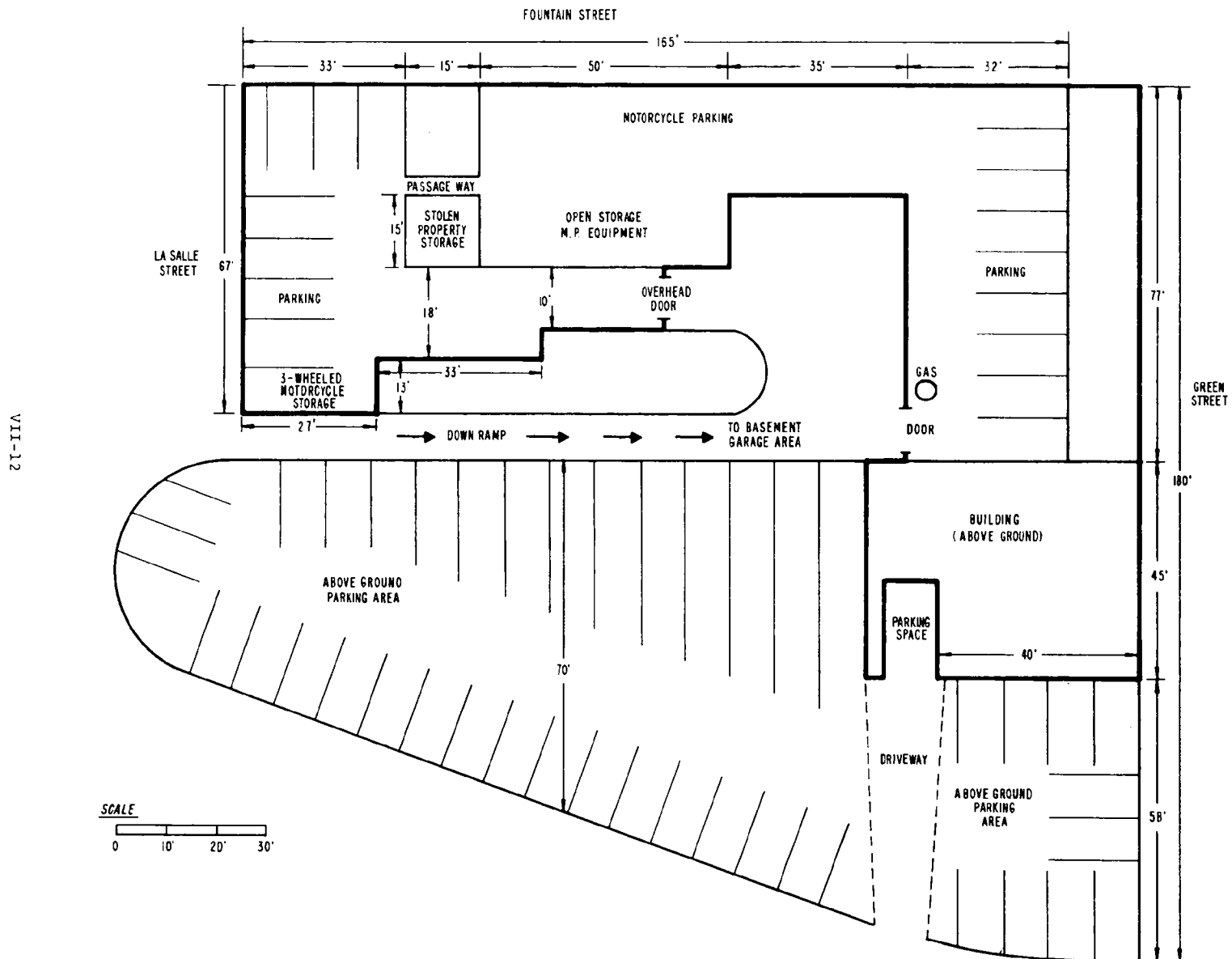
THE LASALLE STREET BUILDING

During the course of the study, our consultants became concerned about the adequacy of parking area for Police vehicles at LaSalle Street. At various times, it appeared that the surrounding streets were congested with Patrol and Traffic vehicles, and that the parking lot was filled almost to capacity. After observation and analysis, PMM&Co. concluded that there were from six to twelve unnecessary Police vehicles. This excess seemed symptomatic of a greater problem: inadequate parking facilities. Accordingly, PMM&Co. reviewed the parking problem.

Parking

The constant movement of Police vehicles makes it difficult to determine parking requirements at any specific time. The most accurate measure of parking adequacy is comparing the number of spaces available to the number of vehicles off duty during the lowest overall utilization time period.

FIGURE 9
BLOCK DIAGRAM OF PRESENT LA SALLE STREET
OUTSIDE PARKING LOT AND BASEMENT GARAGE PLAN



AS THIS DIAGRAM IS INTENDED AS A PLANNING GUIDE, THE FIGURES SHOWN ARE APPROXIMATIONS, NOT EXACT MEASUREMENTS.

Approximately seventy (70) spaces are available at LaSalle Street, and our findings indicate that the greatest number of off duty vehicles at any time is approximately eighty-four (84), which occurs on the Sunday day shift. Assuming that some of these vehicles will be scheduled for service during non-duty time, it would appear that the combined parking available at Bucklin and LaSalle Streets should provide adequate parking for Police Department vehicles Monday through Saturday.

Figure 9 is a detailed ground plan for the outside parking lot at LaSalle Street, which includes about 12,000 square feet and can presently accommodate approximately fifty-five (55) vehicles in marked spaces, with adequate transit lanes. The underground parking garage at LaSalle Street comprises about 4,000 square feet and is divided into three distinct areas. As shown in Figure 9, it provides parking for approximately fifteen (15) vehicles, not including space used for the parking and storage of motorcycles and three-wheeled vehicles, and has adequate transit lanes.

In an attempt to improve the present parking situation, PMM&Co. recommends that:

- . the outside parking lot at LaSalle Street be fenced in to increase vehicle security, even if doing so results in a reduction in total number of available parking spaces;
- . all parking areas be marked and assigned to specific Departments and vehicles;
- . other arrangements be explored to provide parking for Police and Fire Department employees at LaSalle Street;
- . a one-way traffic flow be instituted and enforced to minimize congestion and confusion; the suggested flow would have traffic enter at the present location and exit near the ramp leading to the basement garage;
- . stringent control be exercised over the vehicles that park at LaSalle Street. Under no circumstances should the outside lot be used for vehicle storage.

The number of spaces in the basement garage and in the outside parking lot at LaSalle Street can be supplemented by street parking. We recommend that street parking be limited to the side of the Headquarters building on Green Street; spaces at this location should be marked "For Official Use Only" and the parking of personal cars should be prohibited. We further recommend that only visitors, not officials, be permitted to park in front of the Headquarters building on Fountain Street to avoid congestion and hazard. This front area should not be used for temporary parking during shift changes at the main substation.

Storage

As shown in Figure 9, there are fifteen (15) spaces available in the basement at LaSalle Street, which should be sufficient for Police vehicles personally assigned to senior members of the Department, as well as for those vehicles not regularly used, e.g., the armored truck. Parking at this or any other location should not, however, be used to store obsolete vehicles awaiting disposal.

Refueling

The shift of Police vehicle maintenance and repair from Ernest Street to Bucklin Street eliminates the need to refuel vehicles in the LaSalle Street basement. For safety and control reasons, all Police vehicles should be refueled at Bucklin Street, and the use of the pump at the LaSalle Street basement should be discontinued.

FIGURE 10
IMPLEMENTATION PLAN

Report Section	Recommendations and Steps	Person Responsible	Time Allocated	Date Assigned	Date Due	Date Completed
VIII.	<u>Organize for Implementation</u>					
	A. Appoint Implementation Committee	Mayor	First month	November	November	
	B. Designate Implementation Project Coordinator	Mayor	First month	November	November	
	C. Specify Transfer Date	Mayor	First month	November	November	
	D. Conduct Progress Meetings	Project Coordinator	Monthly	December	Monthly	
	E. Report Project Completion Status	Project Coordinator	Sixth month	December	May	
IV.	<u>To Improve Organization</u>					
	A. Assign Maintenance Responsibility to Fire Department	Project Coordinator	First month	December	January	
	B. Assign Maintenance Responsibility to Highway Department	Project Coordinator	First month	December	January	
	C. Plan to Transfer Personnel	Director of Public Property	First month	December	January	
	D. Transfer Personnel	Director of Public Property	First month	December	January	
	E. Establish Mechanic Training Program	Chief of Fire	Third month	December	March	
	F. Establish Vehicle Operator Safety Program	Chief of Police	Third month	December	March	
V.	<u>To Improve Operations</u>					
	A. Curtail Use of Outside Contractors	Mayor	First day	November	November	
	B. Initiate Tire Changing Policy	Chief of Police	First month	December	January	
	C. Develop Preventive Maintenance Schedules	Maintenance Superintendent	Second month	December	February	
	D. Initiate Production Control Procedures	Maintenance Superintendent	Second month	December	February	
	E. Redistribute Equipment at Ernest Street	Director of Public Property	First month	December	January	
	F. Establish Vehicle Record System	Maintenance Superintendent	First month	December	January	
	G. Transfer Accounting Records	Director of Finance	First month	December	January	
	H. Redistribute Parts Inventory at Ernest Street	Director of Public Property	First month	December	January	
	I. Design and Initiate Management Reports	Chief of Fire	Third month	December	March	
	J. Develop Vehicle Replacement Policy	Project Coordinator	Third month	December	March	
	K. Conduct Study of Motorcycle Utilization	Chief of Police	Third month	December	March	
VI.	<u>To Improve Vehicle Utilization</u>					
	A. Standardize Vehicle Markings and Equipment	Chief of Police	Second month	December	February	
	B. Establish Police Vehicle Pools	Chief of Police	Second month	December	February	
	C. Reduce the Number of Police Vehicles	Chief of Police	Third month	December	March	
	D. Employ Police Vehicle Dispatchers	Chief of Police	First month	December	January	
	E. Establish 3 Shift Maintenance Operation	Maintenance Superintendent	Second month	December	February	
	F. Reduce the Number of Vehicles Assigned to other Departments	Director of Public Property	Third month	December	March	
VII.	<u>For Space Utilization</u>					
	A. Renovate and Equip Ernest Street	Director of Communications	First month	December	January	
	B. Transfer Communications Department to Ernest Street	Mayor	First month	December	January	
	C. Renovate and Equip Bucklin Street	Chief of Fire	Third month	December	March	
	D. Modify LaSalle Street Parking Area	Chief of Police	Third month	December	March	

VIII. RECOMMENDED IMPLEMENTATION PLAN

To implement the recommendations generated by this study, PMM&Co. developed the implementation plan presented in Figure 10. This plan corresponds to PMM&Co.'s format, listing thirty-two (32) action-oriented steps designed to implement our recommendations. The chart specifies the following elements involved in the completion of each step:

- . persons responsible;
- . time allocated;
- . date assigned;
- . date due; and
- . date of completion.

While all PMM&Co.'s recommendations are designed to improve the overall maintenance and repair operation, three (3) are especially critical to effective implementation.

1. The appointment of an Implementation Committee. Specifically, PMM&Co. recommends the following officials be appointed:
 - . Administrative Assistant to the Mayor;
 - . Commissioner of Public Safety;
 - . Director of Public Property;
 - . Chief of the Police Department;
 - . Chief of the Fire Department;
 - . Director of Communications;
 - . Representative of the Director of Finance;
 - . Maintenance Superintendent of the Fire Department; and
 - . Maintenance Superintendent of the Division of Public Works.
2. The designation of an Implementation Project Coordinator. PMM&Co. recommends that the Administrative Assistant to the Mayor be designated as the Project Coordinator. To ensure the timely and orderly implementation of these recommendations, PMM&Co. suggests that the responsibilities of the Project Coordinator include, but not be limited to, the following:
 - . serve as Chairman of the Implementation Committee;
 - . assume responsibility for the implementation of all recommendations within a three month time frame;
 - . control all aspects of implementation;
 - . possess the authority to establish sub-committees and assign tasks with scheduled completion dates;

- . conduct monthly progress meetings;
 - . report project status to the Mayor;
 - . coordinate tasks with other Divisions;
 - . assign responsibility for transferring the maintenance functions; and
 - . develop a vehicle replacement policy.
3. The specification of a time for completion of the transfer of responsibility. Based on the Implementation Plan, PMM&Co. recommends that January 1, 1973 be the target date. At that time, all steps having a designated January due date should be completed.

In addition to these critical steps, PMM&Co. recommends that the Mayor act to curtail the use of outside contractors and to transfer the Communications Department to Ernest Street; these actions seem to present difficulties for other City officials.

The steps outlined in the Implementation Plan are sequenced to accomplish an orderly transfer of responsibility and operations from the Municipal Garage to the Fire and Highway Departments. This sequence is designed to effect the transfer and then to provide for renovations of physical facilities. PMM&Co. recommends that the City proceed in this manner to derive the benefits accruing from an improved maintenance program as soon as possible without encountering further delay due to building renovations. PMM&Co. believes the building modifications are of secondary concern and should be completed only after the transfer and relocations have been effected.

CAR SAFETY CHECK

TIRE CONDITION		MOUNT TIRES			BALANCE		COMMENTS:
LEFT FRONT		<input type="radio"/>		<input type="radio"/>	1	2	
LEFT REAR		LF	<input type="radio"/>	RF	3	4	
RIGHT FRONT			S				
RIGHT REAR		<input type="radio"/>		<input type="radio"/>	5		
SPARE		LR		RR			
EQUIPMENT	GOOD	FAIR	REPLACE	INSTALLED BY			
ALIGNMENT							
FRONT END							
BALL JOINTS - UPPER							
BALL JOINTS - LOWER							
IDLER ARM							
TIE ROD ENDS							
SHOCKS - FRONT							
SHOCKS - REAR							
BRAKE SYSTEM							
LINING							
MASTER CYLINDER							
WHEEL CYLINDERS							
DRUMS							
RETURN SPRINGS							
GREASE SEALS							
BEARING - INNER							
BEARING - OUTER							
HOSES							
POWER UNIT							
PARKING BRAKE							
OTHER							
SAFETY INSPECTION							
HEADLIGHTS							
LIGHTS (MISC.)							
WINDSHIELD WIPERS							
MIRRORS							
IGNITION SYSTEM							
TUBELESS TIRE VALVES							
SEAT BELTS - FRONT							
SEAT BELTS - REAR							
BATTERY							
BATTERY CABLES							
FAN BELTS							
RADIATOR HOSES							
RADIATOR CAP							
GREASE							
OIL							
OIL FILTER							
AIR FILTER							
AIR CONDITION							
EXHAUST SYSTEM							
MUFFLER- RIGHT							
MUFFLER - LEFT							
FRONT EXHAUST PIPE							
INTERMEDIATE EXHAUST PIPE							
REAR EXHAUST PIPE							
TAIL PIPES							
MOUNTS							

CITY OF PROVIDENCE

TIME SHEET

MECHANIC'S NAME

DATE

REPAIR ORDER

DESCRIPTION

START

FINISH

TIME SPENT

NON-WORK TIME

LEAVE

SICKNESS

HOLIDAY

OTHER

REMARKS (TO BE FILLED OUT BY SUPERVISOR)

ASSIGNMENT NO.

EXHIBIT B

CAR HISTORY LEDGER

CAR NO.	MAKE			MODEL			YEAR			COLOR			
ENGINE NO.	TIRE SIZE - FRONT			TIRE SIZE - REAR			DATE PUT IN COMMISSION						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
MILEAGE													
DAYS IN SHOP													
NO. OF TIMES													
DAYS UNASSIGNED													
GAS													
OIL													
SUPPLIES													
WASH													
TOTAL OPERATING COST													
STD. OPERATING COST													
STANDARD REPAIR & MAINTENANCE													
OUTSIDE LABOR													
OUTSIDE PARTS													
TOTAL OUTSIDE COSTS													
INSIDE LABOR													
INSIDE PARTS													
TOTAL INSIDE PARTS													
TOTAL REPAIR & MAINTENANCE													
STANDARD REPAIR & MAINTENANCE													
STANDARD OPERATIONAL COST													
OPERATIONAL QUARTERLY COST							REPAIR & MAINTENANCE QUARTERLY COSTS						
	1ST QUARTER	2ND QUARTER		3RD QUARTER		4TH QUARTER	1ST QUARTER	2ND QUARTER		3RD QUARTER		4TH QUARTER	
MILES													
ACTUAL COST													
STANDARD COST													
DIFFERENCE													