

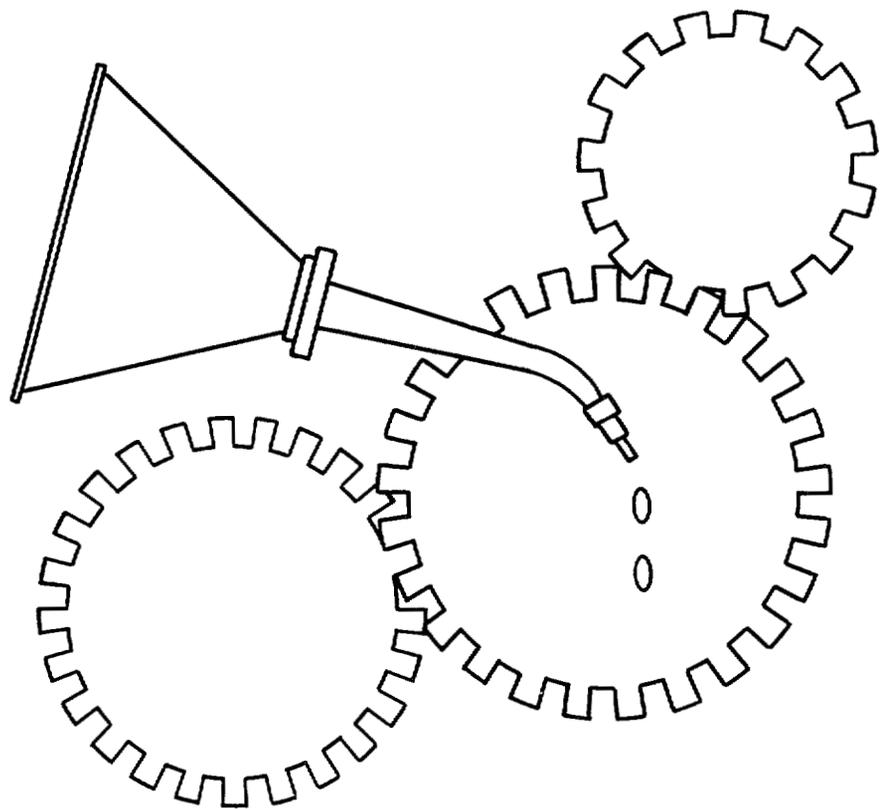
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AUDIT STANDARDS  
SUPPLEMENT  
SERIES NUMBER 7

# USING AUDITING TO IMPROVE EFFICIENCY & ECONOMY



088876



BY THE COMPTROLLER GENERAL OF THE UNITED STATES  
1975  
(1978 REPRINT)

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USING AUDITING TO IMPROVE  
EFFICIENCY & ECONOMY



A case study  
of an efficiency and economy audit  
of a local government activity

By The Comptroller General  
Of The United States

## FOREWORD

"How do you do an efficiency and economy audit"?

In our many contacts with State and local auditors, my staff and I are repeatedly asked this question. In this booklet we try to answer it as we retrace the steps of an actual efficiency and economy audit that was conducted by GAO in a large U.S. city. The broad scope audit approach the staff used is not new. For years GAO has used the same approach to audit Federal agencies, grantees, and contractors. It is the same audit approach advocated by GAO's audit standards.

We became involved in this audit at the request of some city officials who had heard about our broad scope audit approach and wondered if it could be used to trim their city's rising budget. We welcomed the opportunity as a research project which would enable us to learn more about how Federal funds are used by local government. Considerable Federal funds go to cities as grants and revenue sharing, and GAO is responsible for keeping the Congress advised on how these funds are used.

We both benefited from the job. For the city, the audit identified suggested improvements which could result in annual savings of almost \$300,000. And GAO learned that the broad scope audit approach can be readily applied to local government situations.

We hope this booklet will help you appreciate the value of broad scope audits.

  
Comptroller General  
of the United States

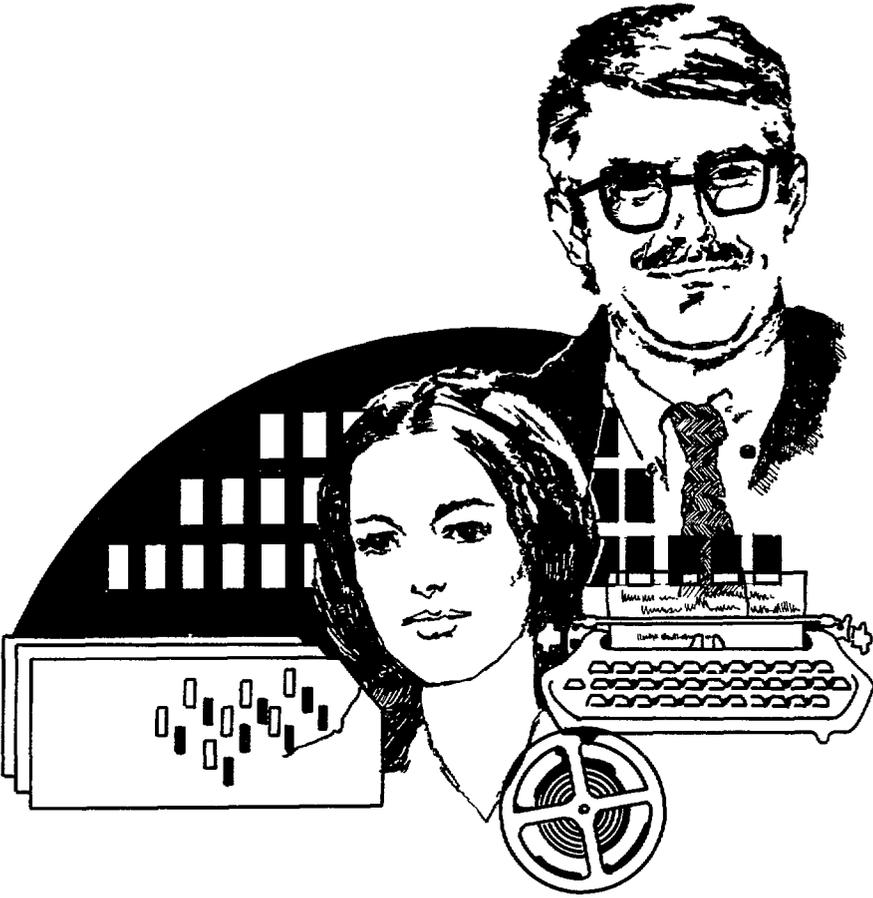
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# The Efficiency And Economy Audit

...a tool to improve management  
and save money



## THE AUDIT APPROACH

How do you do an efficiency and economy audit? The approach that our audit team used is typical. First they made a broad survey to get an understanding of the city's operations. Then they narrowed the scope by identifying some areas where they thought efficiency and economy might be improved, and developed those areas in detail.

### THE AUDIT SURVEY—THE FIRST STEP

The audit survey began in the city's budget office with the audit team looking at whatever management information was available, such as budgets, departmental expenditure reports, and annual reports. The auditor uses the same data managers use to do their job.

The city had a rather advanced system for collecting data. There were budget and expenditure data and analyses of work activities for the current and preceding years. Information was kept on the resources used (labor, equipment, materials) and the output produced.

### CITY BUDGET

NATURE OF EXPENDITURE	BUDGET			ACTUAL EXPENDITURES	
	BUDGET YEAR	PRIOR YEARS		1973	1972
	1975	1974	1973		
CLEANING SEWERS	389,400	360,200	320,400	340,200	275,400
100 FEET CLEANED	38,000	29,800	21,800	24,880	22,660
PER 100 FEET	10.25	12.09	14.70	13.67	12.15
EXAMINING SEWERS					
WITH TV CAMERA	47,500	47,500	36,400	38,800	35,200
MILES EXAMINED	42	42	35	26	29
PER MILE	1,130.95	1,130.95	1,040.00	1,492.31	1,213.79
CLEANING CATCH BASINS					
NO. CLEANED	140,500	132,000	120,800	160,000	98,800
PER BASIN	15,000	14,500	12,900	13,200	7,900
	9.37	9.10	9.36	12.12	12.51

The auditor reviews management's data, looks for variances...

...then asks WHY?



The city's data was useful in identifying an audit area. Without it the job could still have been done, but probably not as easily. This is how the audit team used the data:

They looked for variances between planned and actual performance. If \$50,000 was budgeted for an activity but its final cost was \$75,000, it raised the question, "Why did this happen?"

Or, if 1,000 units of output were planned, yet only 500 produced, it again raised the question, "Why?"

While variances do not in every instance mean there are problems, often they do.

In selecting an audit area, the organization's data is useful in another way. It helps to determine which activities are most important. In deciding between a neighborhood library program with a \$40,000 budget and a \$300,000 supply facility, which would you choose to audit? Generally, the potential for savings is greater where the money is.

But there are considerations other than dollars when selecting an audit area--what programs are important in the public eye? And which programs have a reputation for management problems?

Internal reports, consultants' reports, and interviews with city officials provide valuable information. The auditors spoke with budget office officials and with several department and bureau heads. It was a good time to discuss suspected problems. Airing the problems helped to determine which ones merited audit effort. By working together, both the auditors and managers learned from each other.

### **AN AREA IS SELECTED**

The survey work led the audit team to select the Bureau of Streets and Sewers. Budget, cost, and productivity data pointed to the Bureau. Its budget was a substantial \$5.2 million for 1975. And there were differences--some major--between budgeted and actual expenses and in units of output. Expenditure data for the present and preceding years showed a marked increase. Productivity trends were flat--some on the decline. And it had been a long time since any study of the Bureau had been

made. The combination of all of these factors told the team this was where their audit should be made.

## THE NARROWING PROCESS

Work began in the Bureau of Streets and Sewers by gathering information and trying to narrow down the Bureau's activities into a few areas manageable enough to audit. The team wanted to find out what the Bureau did, how it was organized, how it was staffed, who did what, and what information was available. Most of this information was readily available in budgets, operations manuals, and financial and program reports. The team had discussions with officials and laborers of the Bureau. They also asked for a tour to get a "feel" for the physical layout of the organization and take a firsthand look at what it did.

The additional survey work proved to be worthwhile. The data, observations, and interviews gave the audit team an understanding of what the Bureau did on a daily basis. The work also resulted in some ideas about audit areas.

## FIVE AUDIT EXAMPLES

The auditors had several ideas that seemed to have promise. They discussed them with officials of the Bureau, then selected those which seemed to be most important.

As the following examples illustrate, many different approaches were used to identify and develop the audit areas.

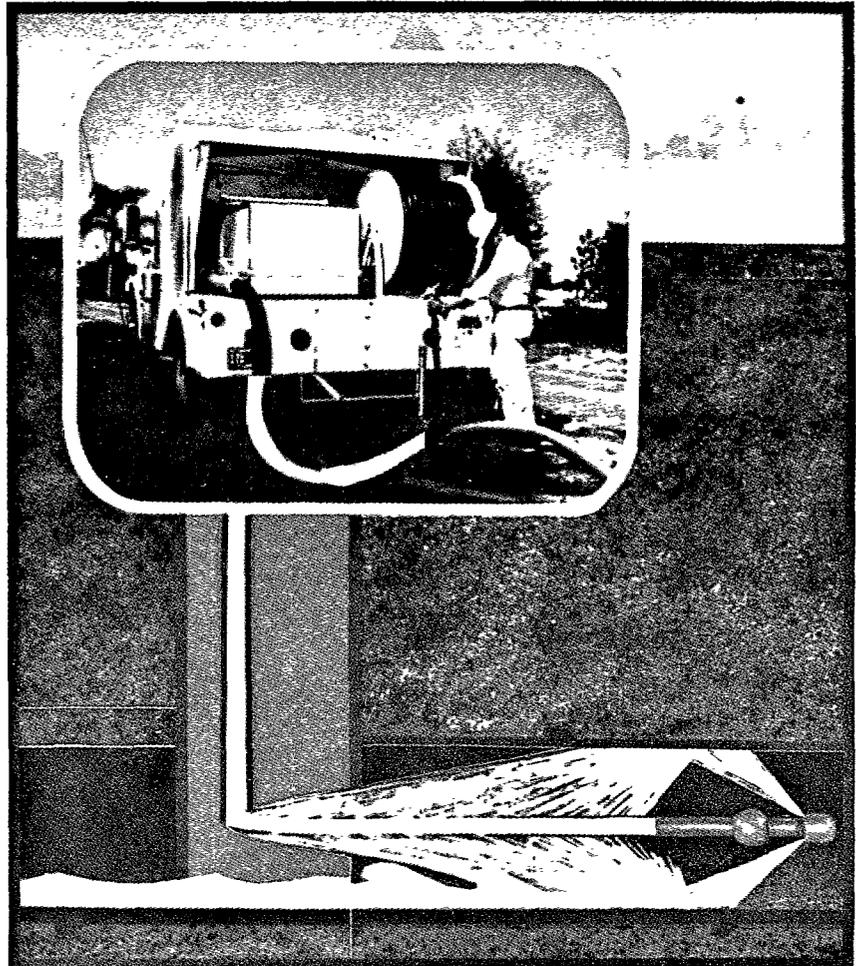
### I. USING AVAILABLE DATA

In reviewing the Bureau's reports, the data on sewer cleaning caught the auditors' attention. Four different methods were used.

<u>Sewer cleaning methods</u>	<u>Total cost</u>	<u>No. of feet cleaned</u>	<u>Cost per 100 feet</u>
Bucket	\$134,534	273,300	\$49.22
Sewer ball	77,963	1,701,100	4.58
Sewer rodder	71,606	917,700	7.80
Water jet	45,864	1,184,800	3.87

Seeing these figures the auditors asked the Bureau supervisors if a less expensive method could be used in place of the bucket method. Some of the supervisors advocated using the water jet. But the jet was new and a convincing case had not been made for a switchover. Other supervisors were not convinced that the jet could do the job, so they were hesitant to make the change. They felt confident with the bucket method.

## FINDING A BETTER WAY



SEWER CLEANING — WATER JET METHOD

There was one supervisor, however, who wanted to prove the jet could replace the costly bucket method. He used the jet to clean a large section of sewer line that had been scheduled for bucket cleaning. In 24 hours he cleaned what would have taken a bucket crew 294 hours.

Next, using the Bureau's own data, the audit team computed how much could be saved if the jet were used. In 1974, for example, 273,300 feet of sewer line were cleaned by bucket method. They estimated that \$124,000 could be saved annually if the jet replaced the bucket.

<u>Computation</u>	
\$ 49.22	cost per 100 feet - bucket
<u>3.87</u>	cost per 100 feet - jet method
45.35	difference in cost per 100 feet cleaned
<u>2,733</u>	units of work (273,300 feet of sewer line)
\$123,942	potential savings

They discussed this analysis with the Bureau's officials. When the officials saw that the jet could handle the job and save money, they acted promptly to purchase additional jet equipment. At the level of savings anticipated, the jet equipment will pay for itself in less than a year.

## II. OBSERVATION

Auditors should not rely solely on management's reports to get the full story. If accepted at face value, data can sometimes mislead the auditor to conclude that a job is being carried out at peak efficiency. It is worth the effort to take a firsthand look at how a job is being done. The auditor doesn't have to be a time and motion expert to observe an activity and form an opinion on its efficiency. Often all that is necessary is an inquisitive mind which asks, "Is there a better way to do this?"

When it came to cleaning sewers, the sewer ball method was among the best--so said the city's productivity data. Productivity of sewer ball crews had increased 20 percent in the past year. On the surface, the picture looked good. Nevertheless, the audit team decided to observe the sewer ball crew in action.



In visiting the crew, the auditors' initial reaction was that the five-man crew was too large. It appeared that a three-man crew could handle the job if they had some power equipment to help them.

--A hand-operated winch was used by the sewer ball operator to pull the ball through the sewer line. This was a strenuous task--two men took turns at the job. But with a power winch, one man could manage it.



--A laborer positioned at a nearby hydrant turned the water on and off as it was needed by the sewer ball operator. The operator could regulate the water himself if a shut-off valve were installed near him.

The audit team discussed their ideas with the supervisor in charge of the cleaning operation. He was all for the changes. By the time the audit was completed the new equipment was on order. Next year the city will save about \$40,000 in labor costs.

### III. THE SUPERVISOR'S SCHEDULE

Inefficiency is found in management as well as labor. At the management level, efficiency may be improved by using different management techniques or simply by freeing supervisors from the clutter of unnecessary detail so they can deal with the things that really deserve their attention.

The audit team spent a day traveling with a few of the Bureau's district supervisors to find out how they spent their time and whether they could make better use of it. Spending the day together meant there was plenty of time to talk. The supervisors complained that there just wasn't enough time to do the things they wanted to do, such as giving more attention to work scheduling, conducting cost studies, and looking into some of the new methods and equipment they had heard about. They just didn't have the time for these things. They were too busy with supervision and paperwork.

After hearing the supervisors' lament, the audit team paid close attention to how the supervisors used their time. They spent half of each day visiting work crews. While some of the crews really needed this degree of supervision, others did not. Some were doing routine work. Since most were under the direction of experienced foremen, the audit team didn't see the need for supervisors to visit every crew every day.

Another two hours of the supervisor's day were spent reviewing foremen's reports for accuracy. Couldn't the Bureau's clerks handle this job?

The audit team discussed these points with the supervisors and showed them how they could cut their daily workload in half by using their time more efficiently. They convinced the supervisors that some of their crew visits were unneeded, and that the paperwork task shouldn't be theirs. Now the supervisors have the time they wanted to do their job better. By reducing the time they spent on site visits and paperwork, supervisors now have an additional 2½ staff-years to spend more productively. At their salary rate, that's worth \$40,000.



HOW DID SUPERVISORS SPEND THEIR TIME?  
COULD THEY MAKE BETTER USE OF IT?

#### IV. A COMBINATION APPROACH

Sometimes audit findings are developed using a combination of techniques. This was the case in the following example. Through direct observation the audit team got an indication that work scheduling could be improved. Then they used the Bureau's data to confirm this problem and estimate its magnitude.

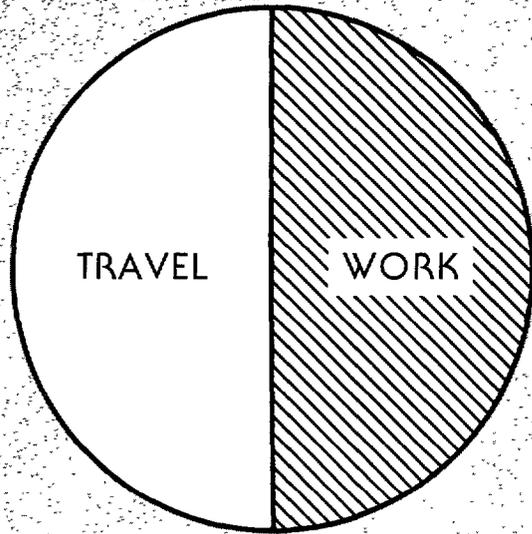
The auditors spent a day with the Bureau's sewer examining crews to get an understanding of how they performed their work. The team observed that a considerable part of the work day was spent driving from site to site. Their stops took them all over the city. In discussing this with the crews' supervisors the audit team learned that work wasn't scheduled by geographic location.

This situation seemed to warrant further exploration so the auditors checked back into the daily work reports that the crews filed. The reports showed that

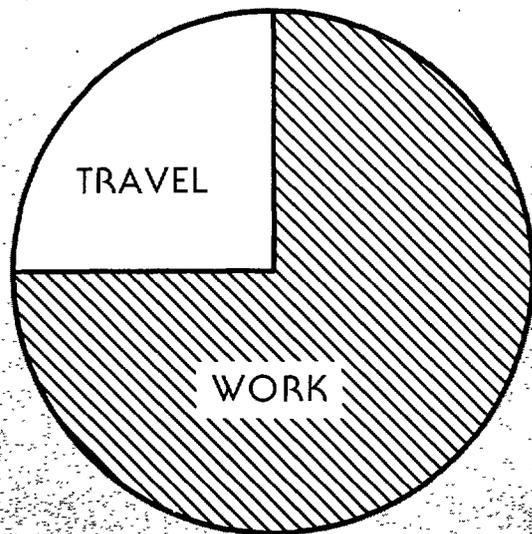
- in some months 50 percent of a crew's time was spent driving between work sites and
- crews sometimes returned to the same area three or four times in a week.

The team estimated that with better work scheduling, travel time could be cut in half. This would increase the productive time of sewer examining crews by 1 staff-year, saving \$12,600.

Less Travel Time Means...



...More Work Time



Travel Time Cut 50%

## V. IDEAS FROM PAST STUDIES

A good source of information in any organization is its file of study reports. Whether conducted internally or by consultants, studies often surface good ideas. But, for one reason or another, they are not always put into practice. The audit team found one such report recommending that the Bureau consolidate its supply facilities.

The Bureau of Streets and Sewers operated three supply yards--the Northwest Yard, the South Yard, and the Central Yard. The study showed that, except for some street work near the Northwest Yard, most crews could conveniently obtain materials from the Central Yard. The study recommended that supply facilities be consolidated at the Central Yard, and the South Yard be closed.

But storage space posed a problem. There didn't seem to be enough available space at the Central Yard to store materials. Thinking that additional land would have to be acquired for storage space, the Bureau never followed through with the report's recommendation.

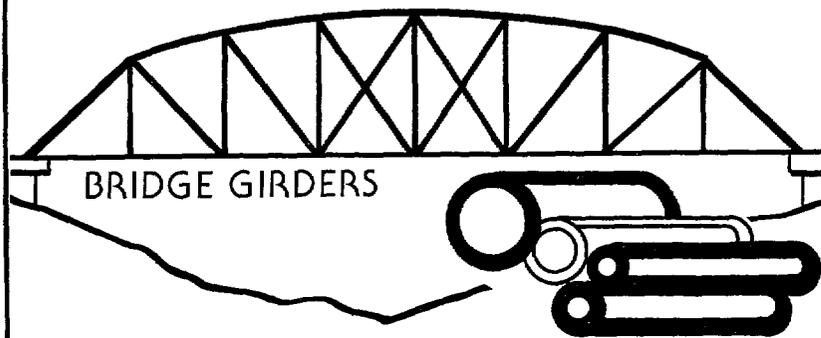
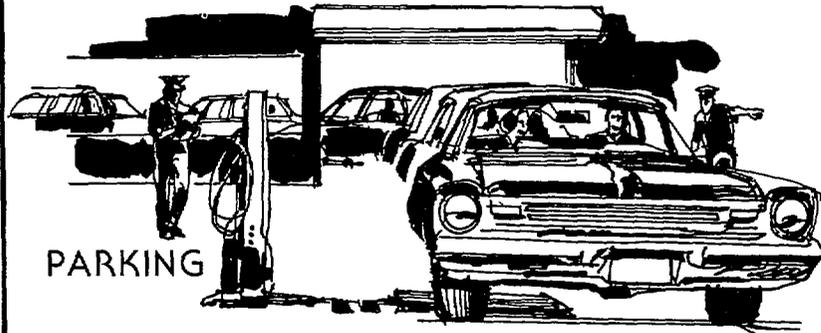
Since the potential for savings seemed good, the audit team reconsidered the case to see if the space problem could be solved. First, they made a systematic check of how much space was needed. They found that the Bureau would need

- half an acre of open yard to store sewer pipe,
- indoor parking for nine vehicles, and
- heated building space for dispatching work crews.

How could these space requirements be met?

A walk through the Central Yard gave the team their first idea. A large area--over half an acre--was used to store bridge girders. They asked a few questions and learned that the girders were seldom used. Convenience of location wasn't important. The audit team recommended that the girders be moved to another location--the South Yard. This provided the half-acre that was needed for storing sewer pipe.

CONSOLIDATION OF  
SUPPLY OPERATIONS  
COULD SAVE \$44,000



Next the auditors looked for the indoor parking. They found it available in a building where snow removal equipment was stored.

Finally they looked for a place for dispatching work crews. They found a storage building that appeared to be suitable. Although another Bureau was using it, they were willing to relocate.

The space problem was solved.

Then the audit team went further, they wanted to see if the Northwest Yard could also be closed. However, they found this to be impractical because of considerable street work in the northwest corner of the city. Nevertheless, working with a Bureau supervisor, the auditors did develop a plan to reduce the Northwest Yard's hours of operation.

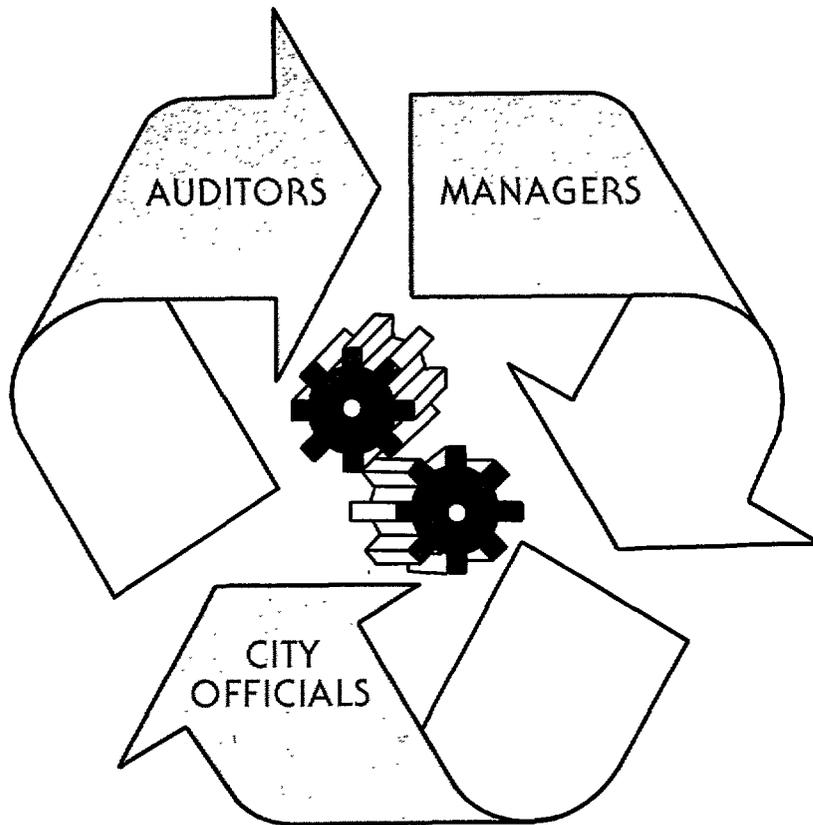
Because of the consolidation and reduced operating hours, the Bureau can expect to save \$44,000 annually in reduced operating costs.

## **THE JOB IS DONE**

The auditor works with management as he develops his audit findings. Nevertheless, when concluding an audit, the audit staff should meet with the officials of the organization to discuss the findings and recommendations before writing the report. Our team used this approach in the Bureau of Streets and Sewers audit. They met and discussed each of the five foregoing audit findings, and some others not covered here. Altogether the auditors showed how \$300,000 could be saved annually.

The city officials responded favorably to the audit and acted on most of the recommendations.

The auditors followed with a written report to make the audit a matter of record.



#### SOME CONCLUDING REMARKS

Broad scope auditing isn't a new idea. It has been used for years and is known by a variety of names. Our experience has shown us that broad scope auditing can save money and improve government activities. Our success with it in the Federal Government has made missionaries of us. As this case study demonstrates, broad scope auditing is just as much at home in local government.

It's not so difficult to do. You learn broad scope auditing by doing it. At first the auditor may have to strain his imagination and try different approaches, but after a while things begin to fall into place--then the savings start to appear.

When it comes to making government operate more efficiently--it works.

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