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SUMMARY REPORT

OF THE

MAYOR'S TASK FORCE

ON

AIR POLLUTION

May 10, 1966

Norman Cousins

TASK FORCE

ON AIR POLLUTION

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GENERAL STATEMENT

New Yorkers know it is possible to have a critical shortage of drinking water.

It is imperative that they know it is possible to have a critical shortage of breathable air.

The cause of foul air is simple: indiscriminate dumping of waste materials and poisons into the air.

The condition of New York's air is bad and is getting worse. The Task Force is convinced, however, that the trend can be reversed and that fundamental and far-reaching improvements can be achieved.

New Yorkers need not be defeatist about the quality of their air. What has to be done is difficult but not impossible.

The city government must move swiftly, decisively, effectively in protecting its air supply. This can happen only if the public is fully alerted to the dangers, fully educated to the possibilities for corrective action, fully prepared to support the hard, uncompromising measures that are required.

Such measures will not be inexpensive. But they will cost far less than the half billion dollars that New Yorkers had to pay last year because of filth and poisons in the air.

Air pollution is expensive because it more than doubles the home-cleaning and clothes-cleaning bills of the average family. It cracks the paint surfaces of cars. It eats into the stone, cement, or brick facings of buildings, doing more damage in five years than would occur over a century under conditions of clean air. It destroys nylon stockings. It makes a farce out of the attempt to keep a clean terrace or grow a garden in Manhattan.

Air pollution is an enemy of the art treasures of civilization. It has an erosive effect on statuary and sculpture. It cuts into the paint on masterpieces.

Air pollution exacts a prodigious toll on human health. The United States Public Health Service has identified air pollution as a contributory cause of cancer. It is irritating and probably damaging to sensitive lung and respiratory tissues. It produces fatigue, reduces working efficiency, makes people edgy and tense. It cuts into the enjoyment of living. It cheats a man of his right to live under a blue sky.

Air pollution adds to the hazards of automobile driving by reducing visibility and by affecting the ability of drivers to respond to emergencies.

Air pollution is a menace to flying safety. It shrouds the airports over the Metropolitan area with a brackish fog. It makes a false horizon line. It reduces the safety margin for landing operations.

All the ingredients now exist for an air-pollution disaster of major proportions. It is a serious error to suppose that the kind of air poisoning that brought tragedy to London, England, and Donora, Pennsylvania, could not happen here.

On a smaller scale, air-pollution emergencies have already occurred in New York City. At least three times during recent years, a condition of stagnant air loaded with gases and particulate matter has resulted in a sudden and detectable increase in the death rate.

New York City pumps more poisons per square mile into its air than any major city in the United States. The main reason this condition has not produced widespread disaster in the past is that New York has open topographical surroundings and therefore enjoys the cleansing effects of the prevailing winds.

Given the same sheltered topography as Los Angeles, New York City would be uninhabitable--taking into account New York's greater pollution output.*

*Statement by Vernon MacKenzie, U.S. Public Health Service, in consultation with Mayor's Task Force, New York, February 8, 1966.

But even a favorable topography does not guarantee the constant flow of surface winds. Under "inversion" conditions, a layer of warm air acts as a ceiling over cold stagnant air. Trapped smoke and gases produce an effect similar to that of an indoor parking garage, with all the automobile motors running and almost no windows or doors open.

New Yorkers must not deceive themselves into believing that minor or halfway measures will meet the problem.

The Task Force does not doubt that tough, resolute action on a large scale will be taken. It does, however, raise this question: Will the action come about as the inevitable result of a disaster, or will it come in time to avert one?

SOURCES OF THE POLLUTION

Where do the poisons and dirt in the air come from: They come from a variety of sources:

1. New York City's eleven municipal refuse-disposal stations. Forty-seven furnaces and smokestacks are involved, almost all of them operating with inferior smoke-and-gas control equipment. These stations operate in almost constant violation of New York's own laws against air pollution.

2. New York City's Housing Authority projects. These projects operate 2,666 incinerators and 2,500 heating furnaces, most of them in need of effective pollution-control equipment.

3. Privately owned apartment houses and office buildings. They operate approximately 10,000 incinerators and 135,000 heating furnaces, all but a few of which are totally lacking in pollution-control equipment.

4. Approximately 600,000 private residences (single and double family dwellings). Most of them use fuel oil in their heating furnaces, operating at varying degrees of efficiency.

5. Consolidated Edisons eleven power-generating stations inside the city. Con Ed's 116 boilers and 49 smokestacks operate for the most part under inefficient conditions of pollution-control.

6. Approximately 8,500 industrial manufacturing establishments. Many of them produce noxious emissions.

7. Demolition and construction dust. Whether with respect to old buildings being torn down, or new buildings being put up, large quantities of dirt and dust are thrown into the air.

8. Ordinary street dirt. An incalculable quantity of dirt, trapped under parked cars, where sanitation trucks cannot get at it, is easily blown into the air.

9. Approximately 13,000 lunchrooms and restaurants. A large number of them emit smoke and odors at street level.

10. Approximately 1,500,000 automobiles, buses, and trucks. Practically all of these vehicles now operate without devices to control their noxious gases and particulate matter. Many of these vehicles require normal engine and exhaust repair. Friction of automobile tires produces rubber dust in the air. Brake-linings contribute asbestos pollutants.

11. The emanations from approximately 400,000 take-off or landing operations of jet aircraft at New York airports each year.

12. Approximately 25,000 steamship operations in the New York Harbor each year, apart from an indeterminate but substantial number of engine-run harbor craft. Many of the steamships lack pollution-control equipment; some blow their tubes under cover of darkness.

13. Pollution by air invasion. Dirty air drifts into New York from hundreds of miles away and especially from nearby New Jersey, with its relatively uncontrolled industrial complexes and incinerators.

KIND OF POLLUTANTS

What kind of dirt and poisons are produced by these pollution sources? Soot, flyash, sulfur oxides, nitrogen oxides, polynuclear and olefinic hydrocarbons, and carbon monoxide are the main villains in the pollution assault on human health, on vegetation, on property, on aviation safety. This is the breakdown:

1. 230,000 tons a year of "particulate matter" (soot, flyash, etc.).

2. 597,000 tons a year of sulfur dioxide.

3. 298,000 tons a year of the nitrogen oxides.

4. 567,000 tons a year of hydrocarbons.

5. 1,536,000 tons a year of carbon monoxide.

These are the major pollutants in the air environment, though not the only ones. Together, they produce in one year 730 pounds of pollution for each New Yorker. This means that the average New Yorker has to contend with more than five times his weight each year in noxious and obnoxious airborne materials.

AN ENVIRONMENTAL PERSPECTIVE

All the world's large cities have to contend with poisons in the air. This is the price man has had to pay for a civilization that depends on turning wheels, manufactured temperature, and chemical reactions.

A modern metropolitan center is a gross alteration of nature. The vital interaction between earth, water, and air that is required to sustain life is impeded by asphalt and cement over soil, by concrete towers instead of hills and trees, by sewage in water, and by poisons in the air.

The city is the greatest device ever developed by the human mind for the purpose of enhancing culture, facilitating social exchange, and accommodating man's genius for transactions. But the city--which is to say, the concentrated expression of civilization--has also provided man with a thousand ways to alter and cheapen the basic conditions on which life depends. Nothing is more precarious than the delicate balances that govern human existence. Nothing is so little respected or more widely ignored.

The two largest threats against his own person that man has yet to eliminate from his environment are war and contamination from wastes. In a nuclear war, the fragile membrane that sustains human life could be shattered. Even without war, however, man can pollute his environment

to the point of no return.

Man today is in danger of inundation and suffocation from garbage, air-borne poisons, and infected water. He no longer has a feeling of naturalness about nature. To paraphrase A. E. Housman, man is a stranger and afraid in a world largely remade.

New York City is not unique in having to contend with the environmental hazards that come with modern industrial civilization. But New York's problem is unusual in at least two respects.

First, New York's sheer size, its high density of population, and its resultant volume of activity lend an intensity and an urgency to the problem of environmental pollution known by no other city in the United States.

Second, New York is a leader among the world cities.

It follows, therefore, that any program developed by the City of New York for meeting environmental dangers must have the dimensions of leadership. Its program should be built not on routine approaches but on bold, imaginative measures that have a societal value far beyond any gains that accrue to the city itself.

The main elements of such a program may be complex but they are not beyond comprehension. The problem has massive proportions, but it is not overwhelming. Not all

the facts are at hand; but it would be folly to defer action until everything is known. The means now exist for embarking immediately on a comprehensive, sharply defined program that can yield measurable results.

MAJOR ELEMENTS OF AN EFFECTIVE PROGRAM

Here are the major elements, as the Task Force sees them, of a far-reaching and effective campaign against air pollution:

I. The main pressure and energy for control of air pollution has to come from an alert and enlightened public.

II. The fight against air pollution must be incorporated into a comprehensive plan and program for control of all environmental hazards. This program should be related to overall city planning, including urban renewal.

III. The city must begin by cleaning its own house. The city is a major offender and must obey its own laws.

IV. The constant concern of the city must be for the health and welfare of its people.

V. Clean air objectives should be carefully defined. These must be related to a regular, accurate supply of data on air quality, on movement of pollutants in the air, and on their effect on the environment.

VI. The fight against air pollution must be comprehensive and must address itself both to control of fuels (input), and the control of smoke, dirt, and poisons coming out of the stacks (output).

VII. Effective enforcement requires scientific measurement of emissions and administrative penalties for violators.

VIII. A combination of tax incentives and vigorous enforcement can help to accelerate the development of a major industry in the field of pollution-control equipment.

IX. Consolidated Edison should use cleaner fuels, institute major modernization of existing equipment, and at the same time plan for power-generating facilities outside the city.

X. The use of fuel oil or coal for heating purposes -- whether in private residences or apartment houses or power-generating stations or public buildings -- must be carefully governed with respect to sulfur content.

XI. The City must have a total plan for waste and garbage disposal that includes a ban on open burning of refuse materials and rigid control of all incinerator operations, public and private. The city must also consider possible alternatives to incineration.

XII. The City can act to reduce pollution caused by gasoline and diesel engines even though it has no licensing powers over automobiles in general.

XIII. New York City exists in a geographical complex of cities -- some of which are outside New York State -- and must therefore coordinate its efforts with State, regional and Federal agencies. The City should seek its full share of Federal and State aid for combating air pollution.

XIV. The City must seek new, advanced approaches and techniques in the fight against air pollution.

Not all these fourteen elements of a comprehensive program can be undertaken immediately, nor can they all be fully implemented within a stated period of time. But they all belong to an action program. The program logically calls for a three-stage approach.

The first stage comprises those measures that can be taken immediately by the City government--without waiting for additional surveys or the development of new technology. The first stage also includes application of existing technology, and consent agreements by private organizations whose operations now result in substantial air pollution violations. An important aspect of the first stage is for research and planning required to carry out later stages of the program.

The second stage comprises those measures which can be made effective within a period from two to five years. In particular, the second stage involves improved air monitoring, elaboration of data-handling systems, specific abatement plans, and the general installation of more effective pollution-control equipment.

The third stage is long-range and comprises measures which require more than five years to become fully effective. Among such measures and programs are a new and fully operational system for disposal of total wastes, extension of pollution-free systems of transportation, and the large-scale development, under proper safeguards outside the city, of nuclear installations for generating power, etc.

(In the development of the fourteen key points that follow, first stage is signified by the letters S-One; second stage by S-Two; third stage by S-Three.)

I

INFORMED CITIZENS MUST LEAD THE WAY

The Task Force has looked into the experiences of Los Angeles, Pittsburgh, and St. Louis, all of which have had some success in combating air pollution.

The basic problem in each city was different. Los Angeles' problem is centered on the fact that the city has poor natural defenses against air pollution because of prevailing meteorological conditions. Because of static high-pressure conditions over the Pacific and the surrounding mountains, Los Angeles undergoes frequent air inversions, in which a layer of warm air resting on top of colder air renders the atmosphere relatively static for a period of time. Smog conditions then result. To keep down the incidence of "trapped" smoke, Los Angeles took stringent measures against fuels with high sulfur content, against industrial smoke and gases, against incineration, and against automobile exhaust emissions.

Much of Pittsburgh's problem was caused by the use of heavy smoke-producing fuels without benefit of adequate pollution-control equipment. St. Louis, also, had to contend with heavy industrial smoke.

Whatever the nature of their problems, all three cities had in common one great resource. Nothing effective was done, or could have been done, until citizen action created a groundswell of support for official measures. In Los Angeles, a foundation organized by citizens defined the problem. It provided the information, undertook the education of the public, and in the end helped to create citizen action groups. In Pittsburgh, leading businessmen took the initiative. In St. Louis, a wide variety of community groups banded together.

The Task Force has been encouraged by the response of New Yorkers to the hazards of air pollution. The City's newspapers and broadcasting stations have provided excellent news coverage and background materials. A group known as Citizens for Clean Air has prepared valuable educational materials and furnished speakers to schools and civic groups. The National Pollution Control Foundation, The Scientists' Committee for Public Information, Metropolitan Engineers' Council for Air Resources, Action for Clean Air, The Conservation League, Isaac Walton League, Civic Congress of Staten Island, the Junior League of the City of New York, and others are all eager to cooperate.

The Task Force has held meetings with prominent New York business leaders with the intention of helping to create a Business Advisory Council that can play a role similar to that of business leaders in Los Angeles and Pittsburgh.

A number of approaches can be useful in New York in dramatizing the problem of air pollution and in creating public interest and support:

1. Newspapers. Ads can dramatize the consequences of dirty air to the health and economy of the community. The New York newspapers have already shown their awareness of the problem. The Task Force hopes they will be willing to run ads, perhaps prepared under the direction of The Advertising Council. The Advertising Council has successfully undertaken public service projects for government bonds, Radio Free Europe, Community Chest programs, and many others. (S-One)

2. TV and Radio. These powerful media could be used in the same way as newspapers. The Advertising Council is also equipped to supervise this activity. (S-One)

3. Documentaries. There is obvious drama and demonstrable human interest in the subject of air pollution. It is possible that the national networks as well as Channels 5, 9, 11, 31, and the educational TV Channel 13, would be interested in making documentary films on the subject. (S-One)

4. Magazines. Some magazines have already demonstrated strong interest in environmental problems. The long-range aspects should be brought to their attention as promising magazine material. (S-One through S-Three)

5. NYC as Supplier of Information. The city government should increase its flow of authoritative information to the public about all phases of pollution--results of research projects; progress reports on what is happening elsewhere; air-pollution index; facts and materials supplied by U. S. Public Health Service, etc. (S-One through S-Three)

INDIVIDUAL CITIZEN RESPONSIBILITY

Apart from the support the citizen can give to the kind of activities mentioned above, he is in a position as an individual to help fight air-pollution. The following recommendations come under the heading of individual responsibility:

1. The individual should consider lending his support to responsible citizen groups engaged in the campaign against air pollution. In this way he provides strength to the effort to mobilize public opinion behind an essential program for clean air.

2. The individual can avoid extravagance or carelessness in the use of electricity, at least until effective control of air pollution is established. Conservation of power under the present circumstances means reduction of pollutants in the air.

3. Individual car owners should keep their automobile motors in good repair. Fouled spark plugs, faulty exhaust equipment, the wrong fuel, or any one of a number of causes can lead to heavy exhaust. Automobile owners should not wait for laws to take effect before they install reliable pollution-control equipment.

4. Drivers of automobiles should not race motors on start-ups or while cars are stationary. Do not keep motors running while parked. Despite the popular impression to the contrary,

automobile motors can be warmed up during actual driving, so long as the car moves at moderate speed.

5. Residents of apartment houses should check to see whether the incinerators and heating furnaces in their buildings are properly equipped with scrubber equipment or other means for pollution control.

6. Home owners should avoid burning of leaves or rubbish. The Department of Sanitation, however deficient its pollution-control equipment may be, is still in a better position to dispose of wastes and rubbish.

7. The individual should keep a packet of postcards handy. Whenever he sees a city bus from which clouds of gases are billowing out of the tailpipe, he should put down the number, the location at which he observed the bus, and the time, and send the information to the Department of Air Pollution Control.

II

A TOTAL PROGRAM FOR PROTECTING ENVIRONMENTAL RESOURCES

In some quarters today, there is an extreme and often self-defeating tendency to regard every social problem as part of a still larger one. Yet it is a fact that the physical environment is a whole condition in which each part is affected by every other part. And it is this fact, when fully recognized, that can make life in cities infinitely more productive and congenial.

Air pollution is but one aspect of the whole environment. It is impossible, for example, to separate the causes and effects of impure air and impure water. Poisonous chemicals in the air affect streams and reservoirs. Contamination of both air and water affects crops and livestock and wildlife. Waste disposal, through burning, can create air pollution; through dumping, it can create water pollution. Dumping also creates sanitation hazards. Noise is a prime cause of irritation and tension in the modern city. And noise abatement is closely related to waste disposal and air pollution. The City of New York suffers, for example, from the stench, the dirt, and the noise emitted by trucks and buses. All three of these adverse conditions can be controlled by municipal action. Again the collection of

refuse has a multi-environmental effect. The handling of metal refuse cans and the noises of compactors on sanitation trucks produce a shattering racket, and the trucks themselves emit exhaust gases and particulate matter. The refuse is burned in incinerators that pump smoke and gases into the air. Except on a very limited basis, no use is made of the heat generated by this burning for power purposes. Yet, at nearby locations, large quantities of fuel are burned for generating heat or steam.

As these and similar conditions are studied, it seems clear that whole systems are needed for meeting the City's needs in an orderly, related manner and at the same time reduce hazards in the environment.

For the most part, the City's administrative machinery consists of separate functions that are not now related to the needs of the whole environment. The Department of Air Pollution Control, the Department of Health, the Department of Buildings, the Department of Sanitation, the Department of Traffic, the Department of Public Works, and the Department of Parks all deal with parts of the environment, and too often their work is not closely related and coordinated. Commissioner Arthur J. Benline, of the Department of Air Pollution Control--who has been prompt and unstinting in his cooperation with the Task Force--has had to perform his duties under considerable handicaps. The enforcement machinery available to the Commissioner

would be inadequate for a city half the size of New York. The Department of Air Pollution Control has no effective recourse against other City departments that violate its codes. Nor can it attempt to deal with large-scale, fundamental questions, such as the eventual feasibility of power-generating stations within the city limits. The Department's budget is cramped, its research facilities are limited; its equipment for measuring air quality and detecting violations throughout the city is grossly inadequate.

The Task Force is convinced that no major improvement can be accomplished in the quality of New York's air until the problem is regarded as an indigenous part of the whole environment. The city needs a system for interrelating and coordinating problems of air pollution control, water pollution control, solid waste disposal, noise abatement, congestion, and protection of both natural and man-made facilities that give pleasure and well-being to its citizens.

The Task Force therefore recommends:

1. The creation of an Environmental Control Board, vested with requisite powers to set policies, undertake basic planning, and oversee operations of city agencies dealing with environmental problems. (All Stages)

2. The E.C.B. would set objectives for air quality.

3. The E.C.B. would establish standards of monitoring and measurement, and sponsor research in the various fields under its jurisdiction.

4. The E.C.B. would help to prepare and distribute educational and informational materials for use by citizen groups, schools, and communications media.

5. The E.C.B. would carefully coordinate its work with the Department of Health, which has a key role in the fight against air pollution. The E.C.B. would also maintain the closest liaison with all city agencies engaged in basic city planning or urban-renewal planning. This is especially essential in the construction of roads and building projects and in the balancing of population requirements.

6. The E.C.B. would seek to coordinate the efforts of all groups and agencies, official and unofficial, dealing with various aspects of the city's environment -- within and

without the city, and would have attached to it advisory groups in the fields of health, air pollution, water pollution, noise, congestion, pesticides, and despoilation.

7. Members of the E.C.B. would serve without pay.

8. The E.C.B. would have a professional Executive Director and a paid staff, in addition to professional consultants.

9. Pending its statutory incorporation as an agency of the City of New York, the E.C.B. would operate as an arm of the Mayor's Office.

III

THE CITY GOVERNMENT AS A MAJOR OFFENDER

The city is a gross violator of its own laws against air pollution. Its public transportation system, its incinerators, its heating furnaces, its hospitals and schools spew out vast quantities of filth and poisons. There is, as a result, an air of hypocrisy in the city's actions against citizen violators of clean air.

The city cannot expect to be taken seriously in its efforts to combat pollution unless it acts vigorously and promptly to reduce the filth, smoke, and poisons produced by:

1. The incinerators in its own waste-disposal plants;

2. The stacks of its own housing projects, its schools, hospitals, and other public buildings;

3. Its own buses, sanitation trucks, police cars, squad cars, department cars, fire engines, and ambulances, and the vehicles it licenses for operation within the city;

4. Its road-building and road-maintenance operations.

This is what New York must do to put its own house in order:

1. It must install effective air pollution equipment in its incinerators or, alternatively, it must find other methods for disposing of garbage and waste. (The Task Force has learned of new low-pollution incinerator devices developed by engineers at New York University. These

devices could handle bulky construction materials and most other wastes that formerly went into open burning -- wastes that are now going into land-fill operations.) (S-One)

2. The New York Housing Authority should install modern smoke-control equipment on its incinerators and heating furnaces. New housing projects should have central incinerator stations equipped with effective control devices. (All Stages)

3. The Transit Authority should begin immediate experimentation with pollution-suppressor devices on the exhausts of buses. One such device seen by the Task Force electrostatically separates the particulate matter, causing it to fall back in a cup which can be cleaned at regular intervals. The unit can be inserted directly into the exhaust pipe of automobiles or trucks, whether the engines are gasoline or diesel-operated. The Task Force believes it would be useful to test the feasibility of this and other devices on buses and other city-operated vehicles. (S-One)

4. The city has no licensing power over automobiles in general but it does have licensing power over the 14,000 taxicabs that operate within the five boroughs. The Task Force has made arrangements with several fleet owners to test the new pollution-suppressor devices. The results of these tests should help to determine whether all New York's taxicabs should be required to install the devices. (S-One) (See Section XII)

5. Present Fire Department restrictions on the use of LPG (Liquified Petroleum Gas) should be modified in order to permit the City Transit Authority to test LPG fuels as a possible corrective to pollution caused by use of diesel fuel in combustion engines. (S-One)

6. The City Transit Authority should begin to test with different types of electric-powered and gas-turbine buses. Technology in these fields has advanced sufficiently to warrant serious consideration. The Task Force has learned of a number of electric-

powered vehicles that would seem to fit the requirements of New York City and that could readily be tested. Federal Government funds are available to help finance these experiments. (S-One, S-Two) (See Section XV)

7. The city should take the initiative in calling an International Conference on Urban Electric Automotive Propulsion. Such a Conference would provide a valuable exchange of information and might give impetus to research in the field. (S-One)

IV

CONCERN FOR THE PUBLIC HEALTH

Medical speculation on the subject of the effects of air pollution on health is almost as old as the use of the scientific method in medicine. It is only in the past 35 years, however, that the research has been intensive and systematic.

The results of such research, as in the case of cigarette smoking, are not free of counter-argument and controversy. One fact, however, seems significant: With each passing year, the cumulative weight of the research adds to the indictment of air pollution as a serious hazard to human health.

Some medical researchers believe that air pollution, especially in combination with heavy cigarette smoking, is a contributory factor in cancer.

It is established that air pollutants can invade the respiratory tract, penetrate lung tissue, irritate delicate organs, produce inflammation.

The death rate from lung cancer in New York City has been rising steadily.

As long ago as 1924, Dr. J. Meyers of the New York City Department of Health completed a study indicating a direct connection in New York City between areas with a high death rate from cancer and areas which suffered from heavy air pollution.

The U.S. Public Health Service in 1966 called attention to the existence of carcinogens (cancer-causing materials) in substantial quantity in the air of New York City. High among the offending agents was benzopyrene.

In July 1961, a Metropolitan area medical research project showed the "striking contribution of smoking" to the harmful effects caused by air pollution. Reports from the U.S. Public Health Service contain data on a study in 1962 involving 7,500 surface-transportation workers and 6,000 mail carriers and motor vehicle operators. The study implicated both air pollution and smoking as combined causes of respiratory diseases.

Curiously, the evidence on air pollution as a killer is even more conclusive than the evidence on air pollution as a cause of illness.

In November 1953, medical authorities noted the fact of a sudden increase in the death rate during an atmospheric "inversion" --that is, an atmospheric condition during which the dirt and poisons in the air are deprived of the cleansing action of wind flow. Again, in 1963, air pollution was blamed by medical authorities for a sudden increase in reported deaths. The Asian influenza was widespread at the time. It is believed that air pollution aggravated the effects of the influenza and was responsible for approximately 330 deaths.

Not all people are equally vulnerable to the harmful effects of air pollutants. Older people, whose resistance has been weakened by age, and infants who have yet to develop resistance, are especially susceptible to various forms of bronchial illnesses, of which air pollutants are a major cause.

People with emphysema, asthma, hay fever, etc. are hardest hit by episodes of heavy air pollution.

Recent medical research indicates that air pollution can have a major allergenic effect on some individuals.

Apart from death and the more dramatic forms of illnesses, air pollution can produce extreme fatigue, irritability, headaches, tension.

Anyone who has to contend day after day with the foul emanations from the rear ends of buses knows as much as there is to be known about the connection between automotive combustion and human exasperation.

POISONS IN THE AIR

Of all the poisons in the city air, none exists in greater profusion than carbon monoxide. From every car, bus, or truck operating daily in New York City last year, more than a ton of carbon monoxide was produced, or 1,550,000 tons a year.

Carbon monoxide is colorless and odorless but it hits at the mechanism in the human body that distributes oxygen to the tissues. It produces headache, nausea, dizziness, fainting, convulsions. It cuts heavily into human productivity.

Fortunately, carbon monoxide diffuses easily in the atmosphere. However, under conditions of heavy weather and stagnant air, carbon monoxide has a concentrated potency at street level.

Sulfur dioxide has long been identified as a ubiquitous enemy of human lungs. But it is only recently that the full extent of the health-damaging characteristics of sulfur dioxide has come into relatively sharp focus. It is now known that the harmful effects of sulfur dioxide increase substantially when SO_2 is combined with particulate matter and other pollutants. The "synergistic" negative effect of sulfur dioxide and particulate matter may well be the main one. Sulfur dioxide combines slowly with oxygen and moisture in the air to form sulfuric acid.

Oxides of nitrogen, populous members of the pollutant family, are the products of combustion, whether of heating furnaces or automobile engines. Nitrogen dioxide is a major factor in the existence of smog. It contributes to the atmospheric reactions responsible for smarting eyes and itching throats during periods of high air pollution. It wages unremitting war against the entire respiratory tract, and can cause irreversible changes in

lung tissue. Other nitrogen oxides are also damaging.

Polynuclear hydrocarbons abound in the exhausts of automobiles, buses, and trucks, in the products of inefficient combustion of coal and oil, and in road tar. They are not as profuse as carbon monoxide or nitrogen dioxide when emanated from cars, but they have substantial striking power. Of all the polynuclear hydrocarbons, perhaps the most potent is benzopyrene, which has been identified by medical experts as a major villain in causing cancer in experimental animals. The existence of benzopyrene and other carcinogenic substances in the air in New York has prompted some medical experts to contend that breathing New York air is the equivalent of smoking upwards of nine cigarettes a day.

Other noxious and obnoxious substances in the air are lead, aldehydes, ammonia, hydrogen sulfide, and hydrogen fluoride, varying in intensity and potency. They are the product of a wide range of sources, all the way from industrial stacks to automobiles.

AIR POLLUTION DISASTERS

The worst recorded air pollution disaster in recent history occurred in the Meuse Valley in Belgium in December 1930, when sixty persons died suddenly; in Donora, Pennsylvania, in October 1948, when 17 persons died among a large number who suddenly became ill; and London, England

in December 1952, when 4,000 deaths were attributed to contaminated air.

Inevitably, the most insistent question in the minds of the members of the Task Force from the start of their work was: Could it happen here? What are the elements and factors in those disasters that also exist here, even if only potentially? To the authorities from the United States Public Health Service who came to consult with the Task Force, and to independent medical experts who met with the Task Force, this question was the one discussed at greatest length.

The conclusion growing out of these consultations and studies is that New York, far from being immune to an air pollution disaster, is moving towards a serious and possibly calamitous situation. The concentration of pollutants per cubic foot; the range and striking power of the pollutants; the failure of the people in New York City to mount the kind of massive and sustained attack on the threat -- all these could come together in grim combination to produce an air-pollution disaster of substantial proportions.

The fact that New York has already undergone several inversion episodes should serve as fair warning.

The people of New York City, quite literally, have been lulled by their prevailing winds. These winds are all that have spared the city an unspeakable tragedy.

As mentioned earlier, if New York had the sheltered topography of Los Angeles, everyone in this City would long since have perished from the poisons in the air. The basic recommendation that inevitably flows out of the foregoing is to get rid of the poisons in the air. The essentials of such a program are detailed throughout this report. Attention is especially called to the recommendation in Section V dealing with the need for a regular exchange of information between the Department of Air Pollution Control and the Department of Health.

As a specific matter, more information and research are needed on the effects of pollutants on human health.

EMERGENCY PROCEDURES

The following recommendations are concerned with emergency measures that should be taken in the event of an air-pollution crisis:

1. Turn off all humidifiers, including humidifier equipment in air conditioners.

2. Shut off all electricity unless absolutely essential. The smaller the demand on Consolidated Edison during an emergency, the smaller the output of pollutants.

3. People with respiratory ailments should avoid unnecessary exertions and should remain indoors.

4. Shut off all automobile motors except for emergency transportation. Stay out of cars.

5. Turn off furnaces or keep them going at low levels if the weather is uncomfortably cold.

6. All city incinerators to cease operations.

7. All apartment houses, hotel and office building incinerators to shut down until the all-clear signal is given.

8. All manufacturing establishments using chemicals, solvents, or other substances resulting in emission of pollutants to cease operation until all-clear signal is given.

9. Department of Health and Environmental Control Board officials to maintain combined control operations. Department of Health to superintend emergency health measures. E.C.B. to superintend monitoring as basis for vigil and constant radio reports.

10. Individuals are urged to use transistor radios during period of alert for news about the emergency.

V

THE NEED FOR AN ACCURATE AND SYSTEMATIC SUPPLY OF SCIENTIFIC DATA

Because of budgetary limitations, the Department of Air Pollution Control has been unable to establish its own ambient air-quality goals apart from State requirements or to develop adequate daily information about the quality of air in the City of New York. Such information is needed as a basis for setting anti-pollution policy and enforcing specific air-pollution measures.

At present, the Department takes daily readings at its laboratory and at several check points throughout the city. These readings go into the making of an Air Pollution Index. The Index was the result of consultations with New York State, New Jersey, Federal, and local air-pollution officials. The Index is a calculation that uses the elements of sulfur dioxide, carbon monoxide, and "smoke-shade" to arrive at a weighted number. The Index is of course effected by the location of readings. If the monitoring device is used in the vicinity of a large bridge or tunnel, where traffic is heavy, the Index may reflect

higher carbon monoxide readings than sulfur dioxide. If the monitoring device is used in the vicinity of large incinerators, with heavy fallout of particulate matter, the smoke-shade reading may be substantially larger than the other readings. If the wind drift is such that the monitoring device picks up the fallout from coal or oil-burning stacks, the reading on sulfur dioxide will be fairly high.

The Air Pollution Index as presently constituted is not sufficiently explicit about the range of pollutants. Nor does it provide enough information about the movements of pollution substances in the atmosphere. Finally, it does not adequately determine daily, seasonal, and yearly trends.

RECOMMENDATIONS

The Task Force recommends:

1. A network of both stationary and mobile monitoring stations, using telemetering and systematic processing of air-quality data. The number of sites, frequency of sampling, and the type of measuring devices that should go into the making of such a monitoring network should be promptly determined. (S-One)

2. Sulfur dioxide, carbon monoxide, oxides of nitrogen, particulates, hydrocarbons, should be monitored daily. (S-One)
3. The Department of Air Pollution Control has begun a study to find out exactly what is being pumped into the air annually by restaurants, cleaning and dyeing operations, chemical processing operations, thermal generation, rubber and plastic operations, primary and fabricated metals, etc. It is important to augment this study with a survey of the nature and quantity of the pollutants produced by these sources on a diurnal and seasonal basis. Such data is essential for creating an air-quality profile that can be used in regulation and control. (S-One, S-Two)

4. Since it is difficult to attach a precise number to a properly weighted average of <u>all</u> significant air pollutants, the present Air Pollution Index should be augmented by a daily qualitative description: The condition of the air should be described simply as good, fair, poor, serious, or dangerous, etc. The public is much more likely to

comprehend adjectives than numbers, especially when the scientific basis for numbering has yet to be fully established. Pollution-control officials can do a better job than the public in establishing and interpreting the significance of various levels of pollutant concentration. The New York Telephone Company should be urged to include a brief pollution report in its weather information. (S-One, S-Two.)

5. Under a U.S. Public Health Service grant, and with the cooperation of the Department of Air Pollution Control, meteorological research is now being conducted by New York University. This research should prove an excellent source of data. This arrangement should be augmented by the employment of staff meteorologists who can superintend the development of a mathematical diffusion model for the entire Metropolitan area. (S-One, S-Two.)

6. To the Department of Health should go regular reports on air quality, broken down into intensity and types of pollutants. From the Department of Health should come regular reports on incidence of chronicity and morbidity in illnesses that are related to

air pollution. Such exchanges of information should make it possible, gradually, to determine the emergency levels in air pollution for the particular environment of the City of New York.

VI

INPUT AND OUTPUT : BALANCED CONTROLS

A question that arose again and again in the deliberations of the Task Force had to do with the mode of control of air pollution. Where should the central effort be directed -- to the regulation of fuels or to the control of the smokestacks? In short, should the emphasis be on input or output?

Advocates of input control contend that a reasonable application of law requires that government specify and control materials or ingredients that lead directly or indirectly to conditions of air pollution. They argue that the only certain way to reduce poisons in the air is, for example, by regulating the level of sulfur content in coal and fuel oil, or, again, by specifying what refuse is to be burned.

Advocates of output control contend that the most efficient way of dealing with air pollution is to promulgate standards for stack emissions, and then maintain

rigid enforcement procedures based on a system for detecting and computing violations. The combination of plausible standards and effective enforcement, it is argued, puts the burden on the user to obtain the proper fuels and to obtain whatever pollution-control equipment may be needed to keep him within the law.

The Task Force does not believe that these two approaches are mutually exclusive. Emphasis on input is especially effective in the short-term (Stage One) program for controlling pollution caused by apartment houses and office buildings. The small user can neither afford highly sophisticated control equipment, nor can he individually dictate to his fuel suppliers what the content of sulfur in fuels should be. Therefore, the Task Force supports laws limiting the level of sulfur in coal and fuel oil used within the City.

On the other hand, emphasis on output is feasible for large operators, notably Consolidated Edison, large institutions, large industrial establishments and city incinerators. The key advantage here is represented by the ability to make a scientific determination of precisely what is happening at the point of emission.

The application of output controls for intermediate and large stacks should not preclude regulation of fuels or other input controls. Similarly, emphasis on

input in dealing with smaller users does not mean that smaller stacks would be exempt from mandatory use of scientific measuring devices at such time when technology makes such smaller devices economical and feasible.

Between input and output comes process--everything that happens from the time the fuel is put into the furnace to the time the smoke comes out of the stack. Process involves the types of furnace equipment installed and the methods of their use. It also involves the type of pollution-control equipment, such as precipitators and scrubbers, employed.

It is clear that any comprehensive program of air pollution control must be carefully balanced with respect to input, process, and output.

The Task Force therefore recommends:

1. Input. Sulfur content in fuel oil and coal burned in New York City should be 2.2% by 1967, 2.0% by 1969, and no greater than 1 per cent by weight by January 1, 1971, as required by Public Law 49, except as the use of additives or pollution-control equipment brings stack emissions within prescribed standards. (See Section X.) (S-One, S-Two.)

2. Process. Inspection of furnace equipment for both space heating and incineration, as well as specifications for performance of such equipment, should become a major part of the work of the Department of Air Pollution Control. (S-One, S-Two.)

3. Process. Increasingly sophisticated furnace and air-pollution control equipment requires special training for operators. The Department of Air Pollution Control and Department of Buildings should cooperate in helping to arrange for such special-training facilities.

4. Output. Dust-and-smoke-measuring devices should be installed as soon as possible in all large and intermediate stacks, as described and recommended in Section VII. (S-One, S-Two)

5. Output. Instrument manufacturers should be urged to develop reasonably priced and technologically sound pollution-measuring devices for small stacks. (S-One)

VII

SCIENTIFIC MEASUREMENT OF VIOLATIONS AND APPLICATION OF ADMINISTRATIVE PENALTIES

The present system for detection and enforcement of violations is archaic, inexact, creaky. It depends on visual observations. It relies too much on chance. It tends to tie up the already overburdened calendars of the courts.

A good part of the present work of air pollution inspectors involves answering and investigating complaints of citizens. The citizen's right to complain is a natural and essential part of good government. At the same time, limitations in the efficacy of citizen complaint in the field of air pollution have to be recognized.

At present, if a citizen observes a smokestack belching heavy black smoke, he telephones the Department of Air Pollution Control. An inspector, if one is available, is dispatched to the area, generally by radio car. Sometimes, the emission may have receded or ceased altogether by the time the inspector arrives. On those occasions when the smokestack is still active at the time of the inspector's

arrival, the smoke activity is viewed through a "Ringelmann Chart," a small plastic card on which are pictured the various densities of smoke for determining whether a violation has occurred. If the inspector decides that a smokestack has been in violation, he issues a summons to the owner or operator, requiring him to answer charges in court.

The amount of time spent by an inspector in servicing a citizen complaint, beginning with the original notification and following through to the court verdict, can be exorbitant. The cost of detecting and punishing a violator, taking court expenses into account, can be many times higher than the amount of the fine.

Moreover, under the present system, the amount of the penalty is not necessarily related to the extent and duration of the violation. The owner of a small restaurant or dry cleaning shop sometimes has to pay as much as Consolidated Edison for a violation, even though the quantity of Con Ed's pollutants may be several thousand times greater.

Finally, it must be emphasized that present methods of detection of air quality violations are severely limited because they are confined to the daylight hours. There can be no doubt that numerous and massive violations occur under the cover of darkness.

The Task Force therefore recommends:

1. Instituting a system of scientific measurement for detection of violations. Under this sytem, devices would be installed directly into large and intermediate stacks for measuring dust and smoke. Such devices now are available or can be adapted for general use. These devices record the intensity of dust and smoke, the time of the emission, and the duration of the emission. The information can be automatically recorded and transmitted to a central control point. The intensity and duration of the violation would serve as the basis for any penalty.

   The individual operator would bear the cost and maintenance of the measuring and recording devices.

   The City would bear the cost of processing the recorded information. (S-One, S-Two.)

2. The application of the monitoring system to the smaller smokestacks will have to await the development of measuring devices that are relatively inexpensive to acquire and to install. There is also the possibility that such devices could be rented or leased and charged off to regular operating expenses. Meanwhile, enforcement of anti-pollution laws for apartment houses, office

buildings, and commercial establishments must rest on the existence of rigorous regulations with respect to fuels that are low in sulfur content, on efficient furnace and incinerator equipment, on efficient combustion methods, and on smoke-control equipment and on properly trained operating personnel as described in other sections of this report.

The present system of court-determined penalities should be replaced by agency-determined penalties. Other states have demonstrated the feasibility and workability of such administrative procedures. Obviously, administrative penalities, when imposed, can still be brought to the courts, but the experiences of other states indicate that such cases are relatively few in number. Moreover, the fact of scientific measurement as a basis for violations can help to reduce what might otherwise be a large number of contentions by violators.

4. Small operators (lunchrooms, restaurants, tailor shops, etc.) should be given prompt authorization to install air-pollution control equipment, conditional upon presentation of a certificate from the manufacturer of such equipment stating that New York City specifications have been met.
5. One of the main concerns of inspectors from the Department of Air Pollution Control should be the air quality of their assigned areas and not solely the identification of violators. Inspectors should take the initiative in instructing violators or possible violators in the proper use of equipment that has pollution propensities.
6. A considerable upgrading of salaries in the Department of Air Pollution Control is essential for recruiting and keeping skilled personnel.

VIII

TAX INCENTIVES FOR ACCELERATING DEVELOPMENT AND USE OF EFFICIENT POLLUTION CONTROL EQUIPMENT

It is possible that a spectacular improvement in reducing air pollution will occur when a demand for control devices gives rise to a new industry with the promise of a large and profitable potential market. Such demand can be brought about, on the one hand, by the interaction of rigorous standards and enforcement and, on the other, by the availability of tax benefits for operators who install pollution-control equipment.

At present, the absence of a substantial market acts as a brake on the development of such devices for average-sized stacks at a price within reasonable range. At least two dozen major manufacturers now produce such equipment for apartment houses, office buildings, commercial and industrial establishments, and restaurants, but research and development have been lagging because of inadequate demand. The City of New York is so large that it could touch off a boom in the mass production of devices for trapping smoke and poisons, encompassing users ranging from small lunchrooms to large apartment houses and skyscrapers.

The Task Force therefore recommends:

1. Minimal property tax assessments on the valuation of approved air-pollution control equipment. (S-One)

2. Congressional representatives and senators from New York City and New York State should be urged to support federal legislation allowing faster tax write-offs for purchase and installation of approved pollution-control equipment. (S-One)

3. New York State assemblymen and senators should be urged to support state legislation along the same lines. (S-One)

4. The Environmental Control Board should arrange for special manufacturers' and suppliers' exhibitions of air-pollution control devices with the emphasis on equipment suitable for industrial, commercial, and apartment-house use. The existence of tax incentives for the installation of such equipment should figure prominently in the promotional material distributed at such exhibitions. (S-One)

5. Consideration should be given to the rental of air-pollution control devices, carrying with it the incentive of tax deductability under operational expenses.

IX

CONSOLIDATED EDISON : NEW PLANTS, CLEANER FUELS, IMPROVED EQUIPMENT

The central fact about Consolidated Edison today is that it lacks sufficient reserve power-generating capacity to meet the needs of a city the size of New York.

A direct connection exists between this critical shortage of power-generating facilities and the air pollution caused by Consolidated Edison. Con Ed lacks adequate reserve capacity to enable it to shut down individual installations long enough to make extensive improvements or to install new equipment.

Con Ed therefore poses two major problems for the City of New York. The first has to do with shortage of power, carrying with it the danger of overloading and consequent power failure. The second has to do with present inability to control the pollutants being pumped into the air.

Aggravating both these problems is the fact that the power demands of New York City are going to double in the next decade.

Air pollution caused by Con Ed last year was the direct result of four conditions:

1. Con Ed in 1965 burned ten billion pounds of bituminous coal inside the City limits. Bituminous coal burning emits dirt, smoke, sulfur dioxide, nitrogen oxides, and other pollutants into the air.

2. Con Ed in 1965 burned more than 800,000,000 gallons of fuel oil a year inside the City limits. Fuel oil burning emits sulfur dioxide, nitrogen oxides, and other pollutants into the air.

3. Many of Con Ed's power-generating stations are old to the point of being antiquated. Breakdowns have been frequent.

4. Pollution-control equipment used by Con Ed at most of its generating stations is in need of repair or replacement.

How is it possible to increase generating capacity to meet New York's spiraling power needs, and at the same time update existing equipment, and at the same time use fuels in a way that will reduce all pollutants?

Consolidated Edison's management has been aware of these razor-edge questions. This has been its response:

1. It has been trying to obtain authorization to construct major nuclear energy installations.

2. It has been considering creating generating stations outside the city, which would require it to bring in the power over transmission lines.

3. It has been trying to get authorization to bring more natural gas, which produces considerably less pollution, into the city.

In all these respects, Con Ed has had very limited success. Con Ed's present use of nuclear power is limited to its small generating station at Indian Point, which supplies about 2 per cent of the city's needs. Public opposition succeeded in blocking Con Ed's plan to pursue the development of a nuclear plant inside the city.

Con Ed's efforts to establish a major new pump-storage hydroelectric unit at Cornwall, on the Hudson River, has run into considerable (and understandable) opposition by many people who are concerned about the preservation of the natural beauty of the site and marine wildlife.

The Task Force is pleased to note that the attempt to acquire an additional supply of natural gas, amounting to 6 per cent of the total Con Ed needs, has recently been granted temporarily by the Federal Power Commission, following an earlier adverse decision. The Task Force took active steps in supporting this application, and it hopes that the supply of natural gas may be expanded on a permanent

basis. For maximum benefit, this extra natural gas should be used in plants which lack efficient pollution-control equipment.

It is natural to suppose that the most effective and immediate way of decreasing air pollution by Con Ed would be to replace coal with other fuels. But serious considerations intervene. The first is that the only immediate alternate fuel in quantities comparable to coal is residual fuel oil, with its additional burden of sulfur dioxide. A second major consideration is that any large-scale shift away from coal would intensify unemployment in Appalachia and affect industries affiliated with coal-producing. Other things being equal, New York ought not to eliminate coal altogether if some way can be found of minimizing pollution from coal-burning.

Here are the main avenues for effective change and improvement in the total operating picture of Con Ed, as they concern the possibilities for reducing air pollution:

1. Power could be generated right at the coal fields (mine-mouth) or at intermediate points, and brought into New York over transmission lines.

   The fundamental question raised here, of course, is whether the erection of coal-fed generating stations outside New York would not merely shift New York's pollution to other areas. Such in fact would not be the case.

First, the construction of an all-new plant can make use of new pollution-control equipment, whereas it would be virtually impossible to shut down existing units in New York long enough to permit basic changes in facilities. Second, new plant sites can be selected with respect to sparseness of population, patterns of wind drift, etc.

Another argument in favor of mine-mouth coal operations is that this system has been tried and proven by other cities.

With respect to intermediate sites: Officials of the Pennsylvania Railroad have made a formal presentation to the Task Force covering the feasibility of building power-generating stations at sites along the Delaware River. The coal would be hauled over tracks from coal-producing areas directly to the Delaware River sites. The electrical power would be transmitted over wires to New York City over an unused and available right of way. (P.R.R. officials emphasized that they now own, and would make available to Con Edison, this unused right of way, thus reducing sharply the cost that would otherwise be involved in buying right of way and constructing a transmission line into the city.)

2. Just as coal can be used without serious pollution complications under certain conditions, fuel oil could also be used without penalty of pollution. Power-generating stations using fuel oil could be built outside the city.

3. A third possibility for combating pollution has to do with the large-scale use of nuclear energy -- again not to supplant all other fuels but as a balanced part of Con Ed's access to different energy sources.

   In general, safety techniques in nuclear plants are steadily being improved and refined. Even so, The Task Force believes it unwise under present circumstances to encourage Con Ed in the construction of nuclear generating plants inside the City. Whether developments in the next decade or so will warrant a more optimistic position in this respect cannot now be anticipated.

4. Still another possibility has to do with increased use of natural gas. Gas storage facilities inside New York City are not easily come by, but the problem of storage, while difficult, is not insoluble. The recent FPC temporary approval of additional gas for Con Ed brings natural gas slightly above 25 per cent of Con Ed's total supply of fuels. Within

the next few years, efforts should be made to increase natural gas to 30 per cent of the total fuel use.

5. Hydroelectric power from the Canadian Northeast is available today and lacks only transmission facilities to become an immediate possibility. Canadian hydroelectric operating stations are already a prime source of power for other American cities.

ENFORCEMENT

So long as Consolidated Edison gives evidence of initiating the required remedial measures and of moving with determination and dispatch towards the long-range objectives, the City can exercise reasonable patience. At the same time, the City cannot be expected to give Consolidated Edison complete exemption from its air-pollution control laws.

As mentioned earlier in this Summary Statement, the present visual system of enforcement is haphazard and unscientific. The Task Force has examined various kinds of equipment now available for constant scientific monitoring of large stacks. This equipment includes a device, installed directly inside the stack, which records the intensity of smoke and particulate matter, as well as the duration of the emission. It appears possible to create a system whereby the recorded information from this device can be fed directly to indicators at Consolidated Edison and into a computer at the

Department of Air Pollution Control. With such information, it would be possible to have a scientific basis for assessing a penalty according to the extent of a violation.

CONCLUSIONS

The Task Force, in considering Con Ed's plants as a source of air pollution, is reasonably optimistic about the prospect of modest gains for the short range and significant improvement for the long range. However, the Task Force sees no dramatic or easy shortcuts by which this can be done.

The Task Force emphasizes the need for a comprehensive long-range program that will retire Con Ed's antiquated plants, to be replaced by power-generating stations outside the city.

What is necessary is a design for what is essentially a new system for supplying New York City with electrical power. This does not mean, however, that no short-term measures are necessary or that there cannot be some improvement in the existing situation. A wide range of measures to bring pollution to a minimum under existing conditions should be given the highest priority in the operations of the Company.

Short-term recommendations:

1. The lines of authority exercised over the operations of Consolidated Edison by the

City of New York should be crisp and unambiguous. The City should require Con Ed to perform its work under a Certificate of Operation, subject to renewal at regular intervals. (S-One)

2. Consolidated Edison should take full advantage of the recent relaxation of oil import restrictions in order to buy fuel oil with less than 1-1/2 per cent sulfur content. (S-One)

3. Con Ed should be directly involved in intensive research efforts toward reducing sulfur in coal and fuel oil and in extracting pollutants such as sulfur oxides from the stacks. (All Stages)

4. Available low-sulfur fuels should be burned at power-generating stations located in heavily-populated areas. This would certainly apply to the East River and Hudson Avenue stations, and, to a lesser extent, to Waterside. Height of stacks is an important factor in mitigating effects of emissions.

5. The decision to assign natural gas to generating-stations should take into account the condition of existing electrostatic precipitator equipment, as well as population density. This

would definitely apply to the Waterside and 74th Street stations.

6. Measuring devices should be installed in all Con Ed stacks for the purpose of determining the intensity of particulate matter.

7. Much more can be done than is now being done to obtain fuel with reduced sulfur content without waiting for the benefits of advanced research; for example, Con Ed should make it a condition of purchase that coal should be washed at the mine to reduce surface sulfur, even though the precise effects of such washing have not been fully established. (S-One)

8. With the full support of the City government and, if possible, of State and Federal agencies, Consolidated Edison should seek to obtain enough additional power from outside sources so that the power-generating stations can be shut down for long-overdue repair and rehabilitation that result in improved operating performance, with a resultant decrease in pollution. (S-One, S-Two)

9. By way of further increasing its reserve capacity, Con Ed should apply to the Federal Power Commission for authorization to build

up its use of natural gas to 30 per cent of its total fuel use. (S-One)

10. Modernization of stations, as soon as reserve capacity can be established, should be carried out at 14th Street, Waterside, Kip's Bay, 74th Street, and certain units at Hudson Avenue. Modernization should involve not just new and improved boiler units but also the installation of efficient pollution-control equipment. Higher stacks should be built in areas of tall surrounding buildings to facilitate better venting where permitted by the Federal Aviation Agency. Variable orifice boosters may be useful.

11. Con Ed should begin now to develop a plan for the substitute use of natural gas and distillate fuel oil for coal and residual oil in the event of an air-pollution emergency episode. (S-One)

12. Immediate studies should be instituted on ways of dealing with the peaks and valleys in the power-demand patterns of New York City. Rapid start-up generally results in increased air pollution. Maintaining a fairly even level of operation would decrease pollutants emitted into the air. (S-One, S-Two)

13. The possible construction of total energy generating units by New York City for its own large housing developments (and other major needs) should be studied as a way of easing the pressure on Con Ed.

14. Con Ed should sign an agreement with the Mayor--morally but not legally binding--stating its acceptance of basic objectives concerned with air-pollution and its readiness to move towards these objectives according to an approximate time-table.

Long-Range Recommendations

The long-range program, in the view of the Task Force, embodies these elements:

1. Mine-mouth or remote coal operations, with power brought into New York City by transmission lines;

2. Hydroelectric power from Canada brought into New York City by transmission lines;

3. Construction of new nuclear power generating stations outside the city, consistent with the compelling requirements of public safety;

4. Retirement of power-generating stations at Sherman Creek, Hell Gate, 59th Street, and the older units within stations at Hudson Avenue and Kent Avenue;

5. A 1 percent sulfur content limit to be required of all coal and fuel oil used in New York City by Con Ed after January 1, 1971, unless the installation of pollution-control equipment accomplishes a comparable effect.

6. Con Ed should be ready to shift, to whatever extent possible, from coal and oil to natural gas on an emergency basis during periods of atmospheric inversion when immediate and drastic measures are necessary to cope with threats to human health from episodes of serious air pollution.

7. Con Ed, during air-pollution emergencies, should also import additional blocks of energy in place of locally-produced power. This will make possible significant emergency-period cutbacks in fuel-burning within the city.

X

HEATING FUELS MUST BE GOVERNED

The largest single user of fuel oil and bituminous coal in New York City, as pointed out earlier, is Consolidated Edison. But an even larger quantity of total fuel is consumed by users for space heating and for industrial purposes. The kinds of fuel oil used are: residual fuel oil, (No. 6); light (No. 2); and medium (No. 4) fuel oils.

Fuel for space-heating and industrial uses results in 847 tons of sulfur dioxide being injected into New York's air each day. The major portion of fuel consumed is for space heating, with the result that the release of sulfur dioxide is concentrated during the winter months. A more accurate comparison is revealed by total tons per year. It is estimated that 309,200 tons of sulfur dioxide are released each year from space heating and industrial sources, as shown in Table X-1. By comparison, Consolidated Edison released 287,985 tons of sulfur dioxide last year, about 7% less.

TABLE X-1

Sulfur Dioxide Emissions

Grade	Tons/day	Tons/yr
#2	57.4	20,934
#4	26.8	9,806
#6	685.8	250,286
Subtotal: Oil	770.0	281,026
Bituminous	59.6	21,760
Anthracite	17.5	6,400
Subtotal: Coal	77.1	28,160
TOTAL	847.1	309,186

The seriousness of sulfur dioxide emissions has been recognized by City administration and legislation agencies. To this end, the Air-Pollution Code of the City of New York now provides for successive limitations (by yearly stages) of sulfur content in fuels. The existing Code limits and the Council Bill #49 limits are shown in Table X-2.

TABLE X-2

SULFUR RESTRICTION IN FUEL

Low Bill vs. Air Pollution Control Code

Bill/Code	City Council #49	NYC APCC
Section	893-1.0	13.03
Date	1/67	10/66
% Sulfur	2.2	2.5
Date	5/69	10/69
% Sulfur	2.0	2.2
Date	5/71	
% Sulfur	1.0	2.2

The Task Force strongly supports the limitation of sulfur content in fuels as required under Local Law No. 49, subject only to the development and use of pollution-control equipment that brings total emissions within prescribed limits. The Task Force believes that a limitation of sulfur content must be so calculated that the City does not in fact lose ground while it is reassuring itself that conditions are inevitably bettered by limitations on sulfur content. For the total quantities of fuels in the City will increase each year, not only in Consolidated Edison

but in space heating and industrial furnaces. It is estimated that total fuel oil and coal consumption may come close to doubling during the 15 years from 1966 to 1981. Moreover, it should not be the goal of the City merely to better conditions. The City should provide the fullest possible implementation of the new Public Law 49 requiring successive limitations of sulfur contents in fuels to a level that allows a measure of safety even under the worse conditions, as in a temporary atmospheric inversion.

The following schedule regulates the importation and combustion of fuels in the City of New York, under Local Law #49.

Date	% of Sulfur
1/20/67	2.2
5/20/69	2.0
5/20/71	1.0

Exceptions from these regulations should be made only on the basis of operation of air pollution control equipment resulting in no greater emission of the sulfur dioxide than would be produced by the otherwise required low-sulfur fuels.

XI

A TOTAL PLAN FOR REFUSE DISPOSAL

In the Middle Ages, people dumped their garbage out the windows. Modern man changes the form of his garbage and dumps it into the air. Supposedly, incineration is a clean way of disposing of refuse. Actually, incineration as presently practiced is a process of transformation through which solids become smoke or airborne dirt and poisons.

Every day, the City of New York has to cope with 32,000,000 pounds of garbage and refuse. Getting rid of all this waste in a way that will not pollute the air or the streams is one of the major problems of the twentieth century.

The reason that incineration, at least in New York City, is not the answer to refuse-disposal is that almost all of it is burned without benefit of effective pollution-control equipment. New York City's own incinerators cover a large part of the City's sky with their black emanations. Not a single one of these incinerators at present is equipped with a modern anti-pollution device. Private apartment houses with incinerators also lack pollution-control equipment. For the most part, such equipment has been either too expensive or bulky to be feasible for the average apartment

house. But compact, reasonably priced control equipment is now on the way. Given a situation of rigid law enforcement and tax incentives, as pointed out earlier, that new equipment may be available much sooner than most people had anticipated.

The New York City Department of Sanitation maintains and operates 11 municipal incinerators with a total burning capacity of 3,320,000 tons of refuse a year. These incinerators emit approximately 38.6 tons per day of particulate matter, a rate considerably in excess of that permitted under the regulations of the Board of Air Pollution Control.

TABLE I-1

Particulate Emissions from City Incinerators

Incinerator	Burning Rate Tons/Hr	Percent of Capacity	Emissions lb/hour	Loading lb/1000 lb
S.W. Brooklyn	18	86	159	1.00
	24	115	252	1.26
Hamilton Ave.	20.9	100	352	1.68
	19.5	93	363	2.43

TABLE I-2

Particulate Emissions vs. Statutory Limits

Incinerator	Emission Actual	Emission Statute Limit	Emission %	Loading Actual	Loading Statute Limit	Loading %
S.W.Brooklyn	159	250	64	1.00	0.65	154
	252		101	1.26		194
Hamilton Ave.	352	250	141	1.68	0.65	258
	363		145	2.43		374

The New York City Housing Authority operates 2,666 incinerators, only one of which incorporates the latest automatic controls and design features recommended for air pollution control. During 1964, the 12,000 apartment-house incinerators burned 738,000 tons of refuse and emitted 23.0 tons per day of particulate matter.

The City operates 8 small sanitary landfill installations which handled 1,505,427 tons in 1964 and the Fresh Kills, Staten Island, landfill which handled 1,393,828 tons in 1964. The older landfill areas are subject to underground fires and thus pollute the air.

Prior to 1966, the City also operated five open burning pits at sanitary landfill sites. In 1964, 194,094 tons of demolition and construction debris were burned at these open burning pits. Open burning has been banned since January 1, 1966, and this oversized debris is now used in sanitary landfill. An additional environmental hazard

associated with this operation is that the improperly handled oversized debris provides nesting places for breeding of rodents and vermin.

Recommended First Stage Corrective Measures

1. The Code for particulate matter control from refuse burning should be revised to conform to the optimum in current technology. The municipal incinerators should be upgraded to meet these revised emission standards. This will involve a considerable expenditure of funds, estimated at $20,000,000. The West 56th Street incinerator, built in 1937, is an obsolete, manual type with low stacks. Due to high rehabilitation costs, it might be more economical to shut down this facility and dispose of the refuse at the Fresh Kills sanitary landfill, utilizing the West 59th Street marine terminal as the loading point. This could be initiated within 6 months, provided alternative arrangements are made to supply heat and power to the adjacent municipal garage, currently being supplied by means of waste heat recovery in the incinerator (coupled with turbine generators). Zerega Avenue, Bronx and Flushing, Queens incinerators are scheduled to be shut down when the new South Bronx plant is built. The new plant is estimated to cost $25,000,000.

2. The Department of Sanitation has initiated a program to evaluate four major types of control apparatus for municipal incinerators: wet baffles (two types will be evaluated -- ceramic baffles and stainless steel baffles), cyclones, scrubbers, and precipitators. Bag house filters are not included in the program but should also be evaluated. It is estimated that the evaluation program will be completed in 18 months if adequate support is given to the effort.

3. Existing apartment house incinerators should be upgraded by addition of automatic controls, auxiliary firing with overfire air jets, and a scrubber system. A study by the Research Division of the College of Engineering of New York University as long ago as 1959 showed that significant reductions in particulate emissions can be effected in a number of ways. Additional devices have been developed since this study was made. Estimated costs to upgrade the incinerators range from $1,500 to $5,000 per incinerator.

TABLE I-3

Modification of Apartment House Incinerators

Modification	Reduction %
Overfire-jet	40
Hartman	45
Auxiliary Fuel	62
Effluent Gas Scrubber	94
Effluent Electrostatic Precipitator	99

4. Apartment house incinerators are not as large a source of particulate matter as the municipal incinerators. However, they are poorly controlled, inefficient, and are located in densely populated areas, exposing large numbers of people to their emissions. In addition, they release a variety of odors and noxious substances. A program to upgrade these incinerators should be initiated at once.

5. By way of reducing air pollution from incinerators, especially with reference to the burning of animal fats and wastes, it is recommended that garbage grinders (sink disposal units) be used in multiple dwellings in those areas of the city (Staten Island, Eastern Queens, parts of East Bronx) where raw sewage is separated for treatment before it is carried into the river, harbor, or sea. A pilot study is recommended for Manhattan, Richmond, Brooklyn, and most of the Bronx and Queens, where untreated sewage is carried into the surrounding waters during periods of heavy storm water runoff. This pilot study should determine the circumstances under which raw sewage from garbage grinders can be carried into surrounding waters without contributing significantly to water pollution. It is further recommended that immediate application be made to the State of New York for funds to authorize such a study. Plans for combating water pollution should give emphasis to wastes from garbage grinders.

6. Sanitary landfills must be operated so as to eliminate inadvertent burning and the breeding of rodents and vermin. Oversized building debris must not be diverted to sanitary landfills. The Sanitation Department should be given modern equipment to break up oversized debris. The Sanitation Department requirement that debris be cut into three-foot lengths should be enforced, until alternative disposal methods, now available in Europe, can either be imported or developed here. Technology exists to dispose of oversize refuse in special incinerators designed to handle large articles with a minimum of pollution.

7. Arrangements should be made to collect and dispose of refuse currently dumped on vacant lots.

8. The City should apply for available Federal funds for a demonstration program of ways in which air pollution from municipal and apartment house incinerators can be reduced.

Recommended Second and Third Stage Corrective Measures

1. While it is imperative to upgrade the existing installations, it is equally imperative to start planning for an entirely new city system of waste disposal. Present methods merely exchange one environmental pollution problem for another. Studies should be initiated in the following areas:

a. New methods of collection should be developed to increase efficiency and to reduce noise and unsightliness associated with present practices.

b. Alternatives to incineration should be developed. The city should apply for a demonstration grant under the Solids Waste Disposal Act for construction of a composting plant using modern technology to convert garbage into salable organic fertilizer or other products.

c. New housing developments should be required to utilize refuse in modern water-cooled incinerators to produce steam which can be utilized in a total energy system to supply space conditioning, power and light for the development. This will reduce the emissions which would occur from a multitude of small incinerators as well as eliminate the emissions from an equivalent amount of fossil fuel which would have had to be burned to provide the same energy.

d. All new municipal incinerators should incorporate the latest design technology for air pollution control including, but not limited to, water-cooled furnaces and control apparatus for particulate matter. These incinerators should be designed with the assistance of the Department of Air Pollution Control and the control apparatus should be evaluated by the Department in accordance with the procedures established in the Air Pollution Control Code, which requires an installation permit and an operating certificate. Emission standards for new muncipal incinerators should reflect present technology. The present emission limits are overly generous.

Conclusions

As the most serious violator of its own regulation the City must display leadership in cleaning up its own facilities. A coordinated effort is needed to evaluate all environmental aspects of refuse disposal to arrive at a plan of action which will eliminate as many of the defects of the present system as technically feasible. A systems approach is required to arrive at a total plan.

The Department of Sanitation has extensive plans for upgrading existing equipment and acquiring modern, efficient air pollution control devices. Moreover, additional new incineration facilities are needed. The funds sought by the Department are large, but the ultimate savings to the people of New York will be larger if the Department receives the support it now seeks.

XII

POLLUTION FROM VEHICLES MUST BE CONTROLLED

The smoke and poisons produced by automobiles, trucks, and buses figure largely in the polluted air of New York City. On an average day in New York, 3,900 tons of carbon monoxide, 1,500 tons of hydrocarbons, and 21 tons of particulate matter are discharged by vehicles into the City's air. People are in direct line of fire from bus and automobile exhausts and are totally without defenses. Almost every New Yorker knows what it means to be assaulted at close range by the smelly and sometimes sickening gases from tailpipes.

It will not be enough for this City to bring smokestacks under control. Unless it finds some way of curbing the tailpipes of gasoline and diesel engines, it will continue to suffer from foul air. Los Angeles, as pointed out earlier, was able to make considerable progress in dealing with pollution from industrial and space-heating sources, but it has not been equally successful in controlling gases and particulate matter from vehicles. The result is continued smog.

The chief sources of pollution from automobiles are (a) exhausts, (b) crank-case "blow-by," (c) carburetor "Hot soak," (d) gasoline tank evaporation. Of these, exhausts contribute perhaps the major portion of pollution caused by automobiles.

Three conditions make it difficult for the City to deal fully with air pollution from vehicles. First, the City, unlike the State, is not the prime licensing agency for automobiles. Moreover, the City cannot control the operation of vehicles that come into its streets from outside the City and from outside the State.

Second, official agencies have been slow to require pollution-control devices on cars, trucks, and buses, with the result that technology has been lagging. Third, the driving public has not been educated to its own responsibility in the control of pollution from their cars; as a result, it may tend to resist paying the minor costs for essential equipment.

The fact of these difficulties, however, should not mean that the city is without effective means for dealing with a large part of the problem. The city's range of action may be circumscribed but it still is broad enough to make a difference in the total pollution problem represented by vehicles.

Any program for coping with pollution caused by vehicles, in the opinion of the Task Force, should be planned with reference to the following key facts:

1. For at least a decade, automobiles will probably continue to be powered by pollution-causing gasoline or diesel fuels. Propane gas and gas turbine engines are not likely to be used soon. An exotic concept such as fuel cells may be some years away from practical application. Nuclear power is a long-range prospect.

2. Federal regulations require all cars manufactured in 1968 and thereafter to be equipped with air-pollution control devices. This is all to the good, but it should be noted that the regulation does not apply to used cars. Therefore, the new regulations will apply to a minority of the car population at first and will not become 100% effective before 1980, given the expected rate of obsolescence of pre-1968 cars.

3. Electrostatic devices for controlling exhausts on gasoline and diesel-powered vehicles now exist but require further development and testing.

4. Emissions from diesel buses and trucks may not be as harmful as those from gasoline engines, but they are obnoxious enough. These emissions can be controlled to some degree by better operation and maintenance of the vehicles, and by the requirement that diesel oil No. 1 be used. At present, diesel oil No. 1 is not readily obtainable, but official action might be helpful in this respect.

5. Chemical additives to diesel gasoline and jet fuels are now being developed for the purpose of improving combustion. This has the indirect effect of reducing pollution in exhausts. Ways in which such additives might have further usefulness as anti-pollution measures should be pursued.

Against this background, the Task Force recommends:

1. The City should evaluate automotive emission standards and should take the initiative in creating a joint research project involving

Federal, State, City, and industry for assessing the effectiveness of automotive exhaust controls. (S-One).

2. As recommended in Section III, particulate control devices should be tested immediately on city-owned vehicles to ascertain their effectiveness and operating characteristics. (The city operates and has control over more than 11,000 vehicles in its various departments - Police, Sanitation, Hospital, etc.) (S-One).

3. The city should use its licensing power over the 14,000 taxicabs that operate inside New York City to require installation of particulate-control devices, assuming satisfactory testing of such devices. (The Task Force has arranged for the testing of an electrostatic precipitator tailpipe device on a number of the City's taxicabs.) (S-One, S-Two).

4. The City should investigate the performance records of taxicabs now in use in some cities that operate at 45 miles per gallon.

5. Within twelve to eighteen months, the City should complete its evaluation of a class of particulate-control devices for installation on all city-owned and city-licensed vehicles. (S-One.)

6. The City should use the full weight of its authority and purchasing power to obtain No. 1 fuel oil for its diesel-powered vehicles. (S-One.)

7. State vehicle-inspection procedures should be developed to assess the effectiveness of the Federal standards established to reduce automobile exhaust emissions. New Jersey and Connecticut should also be requested to undertake such programs. (S-One, S-Two.)

8. Continued upgrading of automotive pollution emission standards should be pursued with the improvement in technology. (S-Two, S-Three.)

9. Experience in other cities with LPG (liquified petroleum gas) in buses, trucks, and cars warrants serious consideration for LPG under City auspices. This requires safe storage facilities and the modification of Fire Department provisions.

10. New York City should support research of the various available gasoline additives for the purpose of reducing ultimate pollution. Should such additives prove both non-toxic and effective, the city should consider requiring all gasoline sold within New York City to meet additive specifications. (S-One).

It is clear that the City of New York should coordinate its planning and activities closely with the State, which is the prime licensing authority for automobiles, and with the Federal government, which already requires automobile manufacturers to conform to certain standards. The experience of California suggests that the law must be explicit and persuasive. It also suggests the need for a nation-wide effort to make air-pollution control a serious matter in the eyes of the public.

Pollution from Airports and Harbors

Other forms of transportation contribute to the foul air in the City. Aircraft taking off from the metropolitan area produce vast amounts of gases and particulate matter in the air, creating "hot spots" of pollution in nearby residential areas. While it is clear that the city can do nothing to limit or control aircraft operations, it is recommended that the City seek all possible aid in this respect from the FAA and other cognizant-government agencies.

Another form of transportation producing air pollution concerns steamships and harborcraft. These are diesel-operated for the most part. "Soot-blowing" by ships is a nuisance that should certainly be corrected.

RECOMMENDATIONS:

1. A severe enforcement program should be undertaken to prevent ships from "soot-blowing" within the harbor of New York. (S-One)

2. Attention should be given to improving the operating practice of ferryboats, tugs, and other smaller craft, so that start-up and idling practices, which cause the heavy exhaust of uncombusted materials, can be reduced. (S-One).

CONCLUSION:

The Task Force has tried to be realistic about the ways and means of combating air pollution from vehicles. Fundamentally, of course, a long-range solution requires the adoption of new pollution-free transit systems, new types of vehicles that are less noxious and noisy and that will reduce automobile congestion in the city. To this end, experimentation should be carried out with turbine and electrically-powered vehicles. Study is also needed on improved methods of rapid transit to airports as an alternative to heavy automotive traffic. For the present, the Task Force, recognizing the organic role of the automobile in the American's daily life, has sought to concentrate immediate measures to <u>reduce</u> pollution from vehicles.

XIII

AIR POLLUTION AS A REGIONAL, STATE AND NATIONAL PROBLEM

1. Pollution-by-Drift

A thin black pall now hangs over the Northeast Coast of the United States, running north and east from Washington, through Baltimore, Wilmington, Philadelphia, Newark, New York, Bridgeport, New London, Providence, and Boston. Seen from the air, the horizon line for hundreds of miles is a black smudge.

In addition to the accumulated garbage in the air carried by the prevailing winds from a great distance, New York City sits under a daily burden of chemical fog and incinerator smoke from the burning dumps and industrial chimneys across the Hudson River.

Some questions growing out of these facts: How much of the polluted air originates outside the city? How much is home-made?

These questions are now being studied by the New York State Board of Air Pollution Control.

Pollution-by-drift has created considerable controversy. Some people contend there is no point in cleaning up New York's air since most of the pollution comes from without. Others argue that the quantity of alien pollution is so slight that it has relatively little effect

on the problem.

The Task Force has attempted some rough estimates based on known sources of pollution originating inside New York City, correlated with pollution index readings. An approximate estimate emerges of from twenty to twenty-five per cent pollution having its sources elsewhere. At the same time, probably 20 to 25 per cent of pollutants originating in New York are deposited elsewhere.

It is an error, therefore, to assert that nothing can be done, or ought to be done, about air pollution in New York until the outside flow is sharply reduced.

It is also an error to claim that outside sources are so slight as to have no effect on the air New Yorkers breathe.

A responsible policy for New York City, the Task Force believes, neither exaggerates nor dismisses the problem of drift pollution. It recognizes, however, an order of importance and a time-table of attack.

New York City's first job is to get rid of its own airborne dirt and poisons. Simultaneously, it can carry out cooperative programs with metropolitan, State, and Federal agencies or organizations. The degree of effectiveness with which the city addresses itself to its own problem will help determine the degree of effectiveness the city will have in working with others.

A total result requres a total attack -- national, regional, local. But a total result is not likely to come in one piece and at one time. Certainly it would be both unwise and unsafe if the people of New York were to defer their own fight against air filth and poisons until all non-New York sources of contamination have been brought under control.

The people of New York must support and participate in anti-pollution programs originated by the Federal government, the State government, and regional authorities. They must call for the greatest possible coordination on these activities.

Meanwhile, no time is to be lost in embarking on a vigorous program inside New York. This action would have an appreciable effect in reducing both the dirt and the harmful chemicals in the air.

2. The Lines of Attack

The three governmental levels on which air pollution is being fought are: the Federal Government with its laws and agencies; the State of New York with its laws and agencies; and the City of New York with its laws and agencies.

A. The major Federal regulations dealing with air pollution are Public Law 88-206 (12/17/63) and Public Law 89-272 (10/20/65) which provides amendments to the original act.

PL 88-206 provides grants for research, training, demonstration, and projects of the various air pollution control agencies. It also provides abatement procedures involved in intra-state and inter-state air pollution proceedings.

PL 89-272 sets up a more codified system for dealing with air pollution controls, directs the Secretary of Health, Education and Welfare to promulgate regulations relating to the control of emissions from new cars, and calls for the cooperation of all Federal agencies in a concerted effort to halt air pollution.

The agency directly involved is the Department of Health, Education and Welfare under which the Public Health Service functions.

B. New York State Air Pollution Control Board has jurisdiction throughout the state and the power to supersede local air pollution laws. It operates under the Public Health Law 1269 and is comprised of the State Commissioners of Health, Agriculture & Markets, Commerce, Conservation and Labor, and a doctor, engineer, industry representative and local government representative. The current annual budget is $403,000.

C. The New York City Department of Air Pollution Control is the operating and enforcement agency for pollution control. (One commissioner appointed by the Mayor and staff. 1965 budget: $1,337,325.) The formulation of the rules for the Department are set by the New York City Board of Air Pollution Control. (The members of the Board are the commissioners of the departments of Air Pollution Control, Buildings, Health, and two citizens appointed by the Mayor for fixed terms.)

In addition to the two above there is the New Jersey State Department of Health under which the New Jersey Air Pollution Control Commission operates. This state-wide commission has a current annual budget of $570,000.

Another commission is the Interstate Sanitation Commission (New York, New Jersey and Connecticut Compact) which operates under Public Health Law 1299-L. Its jurisdiction, however, is confined to pollution between New York and New Jersey only. Actually, this commission's functions are confined to air samplings and to the referral of complaints to the appropriate enforcement agencies. The current annual budget (for air pollution control only) is $36,000.

The single quasi-official agency operating in the area of air pollution control is the New York-New Jersey Cooperative Commission on Interstate Air Pollution.

The committee members are: New York State Air Pollution Control Board, New Jersey Air Pollution Control Commission, New York City Department of Air Pollution Control, the Interstate Sanitation Commission and the Metropolitan Regional Council, and represenatives from U.S. Public Health Service and the U.S. Department of Environmental Sciences. This is a voluntary, cooperative committee for the free exchange of information.

Departments of New York City that have related powers are: Health, Sanitation, Buildings, Fire, and the Board of Standards and Appeals.

Any comprehensive program against air pollution must take all the foregoing lines of action into account. New York City should not only be completely informed about all activities concerned with air pollution; it should seek the fullest possible coordination of such efforts.

3. Outside Financial Aid

A question often asked about New York's fight against air pollution has to do with State and Federal aid. Why, it is asked, doesn't New York City obtain all the help it is entitled to under the law?

Last year, New York City received $190,000 from the Federal government for fighting air-pollution. Los Angeles, with considerably less population, received $210,000; Chicago, with less than one-half the population, received $393,000.

The apparent discrepancies become less startling when the basis for allocations is taken into account. Under Federal law, the amount of the allocation is related to increases in the amount budgeted for air-pollution by the City or State, so long as no single state receives more than 12½% of the total amount available for allocation. Since there have been relatively small increases in New York's budget for fighting air pollution, the amount of Federal aid New York receives is proportionately lower per capita than the aid received by many other cities. New York spends $.15 per capita per year for fighting air pollution compared with $.53 for Los Angeles and $.35 for Chicago.

In 1965, New York City received $465,000 in State funds for combating air pollution.

The only way for the City to get more help from the State and Federal governments is to give greater evidence of its determination to help itself.

Obviously, the City of New York should not step up its air pollution program solely for the purpose of getting its fair share of outside funds. New York has to spend more on air pollution because it can't do a good job on the money it is spending now.

With respect both to a coordinated program with out-of-city agencies and the need for receiving its fair share of outside aid, the Task Force recommends:

1. New York City is part of the world's largest metropolitan complex. Therefore, it must be part of a metropolitan strategy and program in combating area-wide pollution. Specifically, it is suggested that New York take the initiative in forming a Metropolitan Area Strategy Council for this purpose.

2. New York City requires closer liaison with planning and programming activities by New York State in combating air pollution.

3. New York City should take greater advantage of the knowledge, data, and facilities that can be made available by the United States Public Health Service in combating air pollution.

4. The first requirement for any cooperative, broad-gauge attack on the problem regionally is a comprehensive assessment of specific sources of pollution contributing to the overall problem.

5. For purposes of such assessment, the vital areas should include the eight New York State counties in and nearest to New York City; the nearest nine counties in New Jersey; and Fairfield County in Connecticut.

6. New York City's expanded program against air-pollution will entitle it to financial assistance from the state and Federal government. The city should ask for the maximum such assistance.

XIV

PUTTING ADVANCED IDEAS TO WORK IN THE FIGHT AGAINST POLLUTION

The impression grows that the fight against air pollution is being fought today with tools that are at least a half-century behind the capability of present space-age technology.

It seems inconceivable to the Task Force that a nation capable of putting a man on the oxygenless moon is unable to safeguard its atmosphere on earth. More money and ingenuity go into a single excursion into outer space than into all the research and development on air-pollution control in the whole of the United States in one year.

The single great hope for clean air, in fact, is that the American people will put the same kind of imagination and ingenuity into protecting their fragile air envelope that they have given to the penetration of space.

The Task Force does not doubt that science and technology are equal to the problem of air pollution, whether on a municipal or national basis. What is needed is the kind of impetus that high national priorities can provide.

Here are some of the advanced ideas that have come before the Task Force that offer some promise in the campaign against air pollution:

1. The attention of the Task Force has been called to methods by which the sulfur dioxide and sulfur-trioxide emerging from smokestacks can be trapped and converted into marketable sulfur. The technology for this process is now being developed by several companies. There is every promise that within a few years it will be possible for large users such as Consolidated Edison to convert their smokestacks into major sources of revenue. The significance of this development is represented not just by the prospect of additional income, but by the trapping of poisons that would otherwise go into the air.

   The Task Force is informed that it is not beyond the reach of technology, in time, to equip smaller stacks with such sulfur-collecting devices.

2. The Task Force has been given an account of a new system for incineration of oversized waste materials, amounting to four per cent of the City's disposal operation. The system could revolutionize present methods. Not only could the new incinerator accommodate the kind of

construction waste-material that is so burdensome to New York City. It would be practically pollution-free. The device has been tested for more than a year in Jersey City. A single such incinerator has demonstrated its capability to do the following:

a) Receive up to six tons of refuse--large pieces of construction lumber and other products difficult to incinerate--and reduce this mass to 1500 pounds of resalable metal scrap and 120 pounds of clean ash suitable for sanitary landfill.

b) Service a population complex of 48,000 people averaging four pounds of waste materials per person per day without producing air pollutants.

The cost of the pollution-free incinerator device is $80,000 per unit.

RECOMMENDATION: The Jersey City experience of the Kaiser incinerator should be immediately studied and evaluated with a view towards its possible use in New York City.

3. Use of incinerator plant projects for generating steam or power in a total-energy plant. More than eleven billion pounds of waste are burned in New York City each year. The heat generated by all this combustion serves no useful purpose,

except for a small project operated by the Department of Sanitation.

One argument against this method is that it takes 2-1/2 pounds of refuse to do the work of one pound of coal. Another argument is that present generating stations lack the facilities to handle wastes. These arguments represent important considerations but they may not be strong enough to offset the specific and substantial advantages, as Rotterdam and other European cities have already demonstrated. Nor do these arguments address themselves to the possibility of constructing new incinerator facilities that are tied into a steam or power facility.

Basically, of course, the entire question of using incineration for generating electricity is much less a technological problem than an economic and political one. The City of Rotterdam generates its own electricity and therefore is in a position to determine how best to combine its waste disposal program with its power-generating program. In New York City, there are limits to what the City government can do by way of directing its public utilities.

RECOMMENDATION: A special study be made of the European experience in coupling incineration with steam and power facilities, recognizing fully the essential differences between New York's authority and the authority of the European cities involved.

4. Electric self-powered buses are now in use in various cities throughout the world. They are inferior to combustion-engine buses in terms of miles covered without refueling or recharging and in terms of speed. But they are free of pollution and they make little noise. The speed (30 miles per hour) is adequate for city purposes. The reason such buses are not yet in wider use is that batteries require too-frequent recharging. But technology holds out promise of substantial improvements in this respect.

   While self-powered electric-bus technology has not yet reached the point where it would be feasible to effect a wholesale conversion from gasoline to electricity, it would be useful nonetheless to test several such buses under New York City conditions.

5. A basic new concept of taxicab transportation is needed in New York City. The New York taxicab is a regular passenger car adapted for taxi purposes.

As such, it has the best and worst features of stock models. It is swift and sleek. But it also is a victim of its own super-abundant horsepower. It cannot possibly use the high speed built into it. It does not need the basic weight it has to carry. It lacks the maneuverability required for New York traffic.

The result is that the New York taxi is lucky to average 12 miles per gallon. Every gallon of gas burned in New York City means a fixed amount of carbon monoxide, oxides of nitrogen, and hydro-carbons in the air. Poor gasoline mileage also means high expenses.

Cities in Europe and Japan have pioneered successfully in the use of automobiles specially designed and engineered for taxicab purposes. One such taxicab that has come to the attention of the Task Force is light in weight but sturdy in performance; it accommodates four passengers; it gets 45 miles to the gallon under city conditions.

It is possible that such a cab would be entirely unsuitable to New York's needs. Even so, it would be interesting and possibly significant to bring one of these cabs to New York, and observe its characteristics under the special

operating conditions that exist in this city.

6. An increasing source of air pollution is represented by heavy traffic to airports. At some point, New York City might consider the construction of a speedy transportation system such as the monorail to its major airports. Such a system, of course, would have to be tied in with large parking facilities and direct connections to individual terminals. Whether or not monorail facilities are feasible as a long-term measure, New York must begin to think seriously now about the highway glut en route to airports that is certain to materialize within a few years at the present rate of increase in commercial airplane traffic.

7. Recent developments in the use of chemical additives to fuel give warrant for some hope that pollutant content in combustion fuels can substantially be reduced. These developments call for careful study.

8. As technology develops, electrical energy from nuclear power may be generated by means of a fusion reaction, using water as a fuel, controlling the immense energy of the thermonuclear reaction, and emitting no radioactive wastes as in the fission process.

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