Proposed Gasoline and Diesel Fuel Rationing Contingency Plan:

Environmental Impact Assessment

Office of Contingency Planning
Office of Regulatory Programs
Federal Energy Administration

April 1977

Federal Energy Administration

Contingency Plan No. 7

ENVIRONMENTAL IMPACT DETERMINATION OF ACTION TO BE TAKEN UNDER TITLE II, PART A, SECTIONS 201 AND 203 OF THE ENERGY POLICY AND CONSERVATION ACT (RATIONING CONTINGENCY PLAN)

Title II, Part A, Section 201 of the Energy Policy and Conservation Act (EPCA), authorizes the submittal of a Rationing Contingency Plan as prescribed under Section 203 of the same part and title to be submitted to Congress for approval in accordance with the procedures specified in Section 552. Upon approval of such a contingency plan, that plan may be made effective only after the President has found that putting that plan into effect is required by a severe energy supply interruption or in order to fulfill obligations of the United States under the International Energy Program and the President has transmitted such findings to the Congress together with a statement of the effective date and manner for exercise of the plan.

An environmental assessment (EA) has been prepared for a gasoline rationing and diesel fuel rationing contingency plan. Based on the EA, FEA has determined (as described below) that the implementation of these plans would not have significant environmental impacts within the sense of the National Environmental Policy Act (NEPA).

The results of the EA should be interpreted relative to the unusual, i.e., embargo, conditions under which the plan is expected to be implemented. The impact of the proposed FEA action should be distinguished from the impact of the embargo itself. With respect to gasoline usage, the embargo is expected

to cause reduced levels of gasoline consumption as well as socioeconomic impacts resulting from energy supply uncertainties.

Measured against this background of reduced consumption, an expected impact of the rationing plan is potential regionalized shifts in gasoline and diesel fuel usage and attendant air pollutant emissions. In some areas further reductions in gasoline and diesel fuel consumption are expected from rationing: in others, increased consumption and pollutant emissions will result. Although the predicted gasoline usage shifts are not inconsequential, in no case does the plan result in gasoline usage and attendant pollutant emissions greater than the "normal" usage and emissions levels that were occurring before the embargo. In addition, the EA on the gasoline plan assumed no coupon transfers and thereby reflects a maximum impact scenario in terms of fuel usage shifts. These shifts would, in actuality, be mitigated by the transfer of coupons from users in those regions or States that have excess coupons to users in those areas that do not. Furthermore, with respect to the diesel fuel plan, the shifts themselves are not expected to be substantial due to the relatively small number of private users affected as compared with the overall usage of diesel fuel.

The rationing action is likely to result in several socioeconomic impacts, for example, increased employment and a redistribution of income and resources (resulting from coupon purchases). Expected coupon purchases required by certain lower income groups could potentially result in an adverse socioeconomic impact to those groups. However, the purchase of coupons by lower income groups and the implied redistribution of income is expected to be substantially mitigated by the State Hardship Reserve portion of the rationing contingency plan. Accordingly,

any adverse impacts of this nature that do occur are not expected to be significant. These impacts are treated in detail in an Inflationary Impact Statement prepared by the FEA and made available to the public.

In addition to the reasons specified above, it must be noted that any impacts resulting from implementation of the rationing plan are expected to be temporary on the assumption that the embargo itself will be temporary.

Viewed in the above context, the FEA does not consider these impacts to be significant within the sense of NEPA and, therefore, no environmental impact statement will be prepared for the rationing contingency plan.

This Environmental Assessment underwent public review from September 1, 1976, to September 21, 1976, and no comments were received.

ENVIRONMENTAL ASSESSMENT

Table of Contents

Table of Contents (continued)

List of Exhibits

List of Exhibits (continued)

ENVIRONMENTAL ASSESSMENT

A. MANAGEMENT SUMMARY

1. Overview

The Federal Energy Administration (FEA) has developed a contingency plan for gasoline and diesel fuel rationing as required by Title II of the Energy Policy and Conservation Act (EPCA) of 1975 (42 USC 6201). This plan would be implemented only in a severe emergency resulting from a serious disruption of oil supplies, such as in a new petroleum import embargo.

The National Environmental Policy Act (NEPA) of 1969 (42 USC 4231), and FEA regulations contained in 10 CFR 208.4, require that each proposal for Federal action which may affect the quality of the human environment be accompanied by either an Environmental Impact Statement (EIS) or an Environmental Assessment (EA) as to whether the EIS is required. If an Environmental Assessment demonstrates that a proposed Federal action is either not a major Federal action or an action which will not significantly affect the quality of the human environment, FEA must publish in the Federal Register a "negative determination of environmental impact" which announces FEA's decision not to prepare an EIS and that the Environmental Assessment upon which the decision was based is publicly available.

Accordingly, FEA has prepared this Environmental Assessment for the proposed contingency plan for gasoline and diesel fuel rationing.

2. Plan Summary

The proposed contingency rationing plan would require that FEA distribute ration rights to all gasoline consumers -- coupons

for individuals and ration credits for firms.[1/] These ration rights would be required for all purchases of gasoline. Ration rights could be freely transferred, so that persons in need of extra coupons could buy them from persons with coupons to spare.

Diesel fuel rationing would be achieved for wholesale purchases through the FEA Middle Distillate Allocation Program (10 CFR, Part 211, Subpart G). Retail purchases of diesel fuel would be made to persons holding special FEA diesel account cards similar to common credit cards, and to persons with gasoline rationing coupons whose vehicles use diesel fuel.

A complete description of the proposed rationing plan is provided in Part B of this report.

3. Baseline for Study

The baseline used to measure environmental impacts in this study is the environment which would exist during an oil import embargo immediately prior to the imposition of the proposed rationing plan. It is important to stress that the action being studied is not the embargo and its related shortages, but rather the rationing plan, implemented after the embargo has been imposed.

Accordingly, rationing would not reduce the amount of gasoline and diesel fuel available to the United States during an embargo; rationing would instead be a means of distributing available fuel supplies to increase equity and to prevent serious hardships from falling disproportionately on any one income class or geographical region.

The unemployment and other economic disruptions which would result from an embargo, therefore, are not the impacts studied

---

1/ Appendix A contains definitions of these and other terms used throughout the text.

in this report. This assessment measures changes in environmental indicators caused by implementation of rationing, using the already-affected economy during an embargo as the baseline.

4. Duration of Rationing

The Rationing Plan is assumed to be in effect for less than two years. The EPCA limits the life of rationing to nine months, but the authors of the plan assume that Congress would extend the rationing program as long as necessary during an oil import embargo. The plan further assumes that political, diplomatic, and economic pressures on oil-exporting countries would lead to an end to an embargo within eighteen months.

The significance of this duration for the Environmental Assessment is that most rationing impacts are temporary, generally disappearing at the end of the rationing program. This minimizes the environmental impacts associated with gasoline and diesel fuel rationing, relative to many other Federal programs whose impacts are more long-lasting.

5. Summary of Impacts Studied in This Assessment

Listed below are the impacts identified with the proposed rationing plan relative to the baseline. Each is classified in one of three categories:

- physical environment impacts
- economic impacts
- social/quality of life impacts

Each of the impacts presented below is analyzed in detail in Part D of the EA.

5.1 Physical Environment Impacts

- Air quality changes, including increases and decreases at the local and regional levels, resulting from changed gasoline consumption patterns (distribution) during the rationing program. The total air pollutant emission levels for the United States will remain the same because the total amount of fuel consumed remains constant.

- Indirect physical environmental impacts of minor increases in air and water pollution resulting from increased business activity associated with incremental increases in employment and gross national product (GNP) during rationing.

- Increased consumption of paper and other natural resources for coupons, information guides, application forms, diesel fuel entitlement cards, and general administration of the rationing program.

- Increased solid waste, generated by the paper and other resources used for the rationing program, which will add to the existing solid waste loads.

- Reduced fuel handling hazards due to the lessened incentives for individuals and businesses to store extra fuel in automobiles, homes, and at places of business.

5.2 Economic Impacts

- Increased public and private sector jobs due to the rationing program, offset by slightly reduced employment in certain sectors of the economy. (Jobs

lost due to petroleum shortages would not be an impact of the rationing program, but would result from the embargo itself.)

- Positive impact on tourism industry, resulting from increased consumer confidence in finding gasoline during rationing compared to an embargo situation with allocation. Both domestic and foreign tourists will know that fuel will be available, providing they have ration rights.

- Income transfers resulting from the exchange of ration rights among States and among income classes. State Hardship Reserves would make ration rights available at no cost to certain classes suffering hardships, to avoid negative income effects on these groups, which would otherwise have to buy ration rights through the ration rights exchange market ("white market").

- Increased productivity of employees and vehicles as firms consume less gasoline and spend less time acquiring fuel due to shortened lines at retail outlets and decreased search activity for available supplies.

5.3 Social/Quality of Life Impacts

- Public certainty and confidence are increased because everyone is assured of a definite, although limited, fuel supply.

- Maintenance of key services will be assured under rationing as under allocation, including 100 percent of gasoline and diesel fuel requirements for national defense, police and fire protection, and other emergency and public services.

- Equity of distribution of available fuel supplies due to distribution of coupons and ration credits. Hardship applicants can receive ration rights appropriate for their needs. Businesses will be able to serve the public better.

- Inconvenience related to fuel acquisition process will be greatly reduced at gasoline stations, since under the rationing program total consumer demand will not exceed available supplies. Panic buying and tank-topping will be prevented. Rationing adds, however, some inconvenience associated with applying for and picking up ration rights at FEA-designated points.

- Unlawful acts and violence are expected to rise in some categories and fall in others. Violence at the pump and some fuel thefts are expected to fall as the fuel supply is assured; an increase in cheating in obtaining ration rights (due to their monetary value) is likely to occur.

- Driver's license applications will increase throughout the United States, resulting in delays in receiving new licenses and renewals from each State Department of Motor Vehicles.

6. Comparison of Gasoline and Diesel Fuel Rationing with Other Alternatives

Parts E and F of this report describe several possible alternatives to the proposed gasoline and diesel fuel rationing plan, and summarize the environmental impacts of each alternative.

The alternatives described in this assessment for rationing gasoline are:

- "No action" or no new retail restrictions on gasoline other than price controls (the baseline condition).

- Rationing as proposed except that ration rights are nontransferable (eliminating the "white market").

- Rationing with a tax on "excess" gasoline purchase using magnetic cards similar to credit cards for each retail sale of gasoline (Program for Allocation at Retail - "PAR").

- Tax-rebate plan, using a gasoline tax to discourage demand, and frequent rebates of the revenues to the public to minimize negative impacts of the tax on the economy.

The EPCA prohibits the use of taxes to ration fuel. This assessment, however, evaluates the environmental impact of tax alternatives because these alternatives would be viable if the EPCA were amended to allow tax plans.

The alternatives summarized in this assessment for retail sales of diesel fuels are:

- "No action" (the baseline condition)

- "Ration" checking account system

B. DESCRIPTION OF PROPOSED ACTION

1. The Gasoline Rationing Plan

1.1 Introduction

Section 203(a)(1) of the EPCA provides that:

> The President shall prescribe, by rule in accordance with section 523(a) of this Act, a rationing contingency plan which shall, for purposes of enforcement under section 5 of the Emergency Petroleum Allocation Act of 1973, be deemed a part of the regulation under section 4(a) of the Emergency Petroleum Allocation Act of 1973 and which shall provide, consistent with the attainment, to the maximum extent practicable, of the objectives specified in section 4(b)(1) of such Act --
>
> (A) for the establishment of a program for the rationing and ordering of priorities among classes of end-users of gasoline and diesel fuel used in motor vehicles, and
>
> (B) for the assignment of rights, and evidence of such rights, to end-users of gasoline and such diesel fuel, entitling such end-users to obtain gasoline or such diesel fuel in precedence to other classes of end-users not similarly entitled.

Mandatory rationing would be implemented only if all other options for managing a petroleum shortfall proved inadequate, including conservation contingency plans separately developed by FEA. The rationing plan would be operational 90 days after the decision to implement rationing is made by the President. FEA has assumed that any supply interruption severe enough to occasion implementation of the rationing plan would cause FEA to continue or to reimpose the Mandatory Petroleum Allocation and Price Regulations, or similar regulations. Diesel fuel rationing is discussed under Section 2.

1.2 Summary of Plan Operation

The gasoline rationing plan controls the sale of gasoline to consumers by requiring that all consumers present to their gasoline suppliers ration coupons or ration credit checks according to the quantity of gasoline purchased. These ration rights would be periodically distributed to consumers of gasoline according to end-use priority classifications, and according to the estimated total quantity of gasoline available for sale within the United States during a ration period.

The proposed rationing plan is not a system to reduce national demand or to increase supply. Rationing is an attempt to spread the available gasoline supply equitably among all gasoline users, giving priority to certain activities which are considered essential to public health, safety, and welfare, and to prevent hardship from falling disproportionately on any region or class of gasoline consumers.

FEA would issue ration rights for each ration period through four basic programs. One, FEA would provide ration coupons to all eligible individuals (generally, persons holding valid driving licenses). Two, FEA would provide ration credits to all firms (defined to include individuals, government units, corporations, partnerships, etc.) which are engaged in priority activities for which a ration credit level has been established. These ration credits would be in addition to any ration coupons received by persons as eligible individuals. Three, FEA would distribute three percent of all ration rights issued for a ration period to State Rationing Offices which would be authorized to distribute these ration rights (State Hardship Reserves) through Local Boards to handicapped persons and certain other classes of consumers. Four, FEA would reserve one percent of the issued ration rights to distribute itself (the "National

Ration Reserve") under certain circumstances and to adjust deficiencies in the distribution of ration rights under the other three programs.

Each supplier (including a retail sales outlet) of gasoline would be required to (a) collect and redeem ration rights for all gasoline sold (or make arrangements to do so within 10 days of the transaction), and (b) to deposit redeemed ration coupons, ration credit checks, or redemption checks in the supplier's special redemption account. Each seller's resupply rights for gasoline will be based on the gallon value of the ration rights deposited in the redemption account, up to a maximum amount determined by the allocation program. Retail sales outlets could agree to supply gasoline to a consumer without ration rights provided the retail sales outlet itself obtained ration rights to cover the transaction.

The total number of ration credits to be issued to firms entitled to a ration credit level under the proposed plan would be determined without regard to the available supply of gasoline. By lengthening or shortening the term of a future ration period for coupons, FEA would match the ration rights remaining after giving firms their ration credit allotments with the number of ration coupons issued to eligible individuals for that ration period, taking into account the number of ration rights to be distributed to the State Hardship Reserves and the National Ration Reserve.

1.3 Ration Rights Exchange Market

Persons to whom ration rights are issued would redeem their ration rights for gasoline or could sell or give them away. This provision for a ration rights exchange market ("white market") should assure the efficient use of all available gasoline.

Anyone could enter the white market and function as a trader or broker of ration rights. Thus, ration rights could be traded on a "white market" rather than a "black market." FEA would not impose any monetary or administrative barriers to entry. FEA does not expect to prohibit short selling, future sales, and trading in unissued coupon series.

1.4 Eligible Individuals and Estimated Ration Amount

Under the proposed plan, an eligible individual is (a) a natural person having a valid motor vehicle operator's permit, other than a learner's permit, (b) an Indian residing on a reservation under the jurisdiction of the Bureau of Indian Affairs (BIA) who has no driver's permit but who is permitted by BIA to drive on the reservation, (c) an Alaska native of 16 or over who has no driver's permit but who uses gasoline in a snowmobile, boat or other vehicle or tool, or (d) any other person whom FEA designates as an eligible individual. Eligible individuals would receive the same basic allotment of ration coupons for each ration period.

Assuming a 15 to 20 percent shortfall in gasoline supply, FEA currently estimates that the average ration period would be between four and six weeks in length and that each eligible individual would receive eight ration coupons for each ration period with a total value of 40 gallons. Eligible individuals would apply for ration coupons at issuance points to be designated by FEA, on days designated by FEA. Ration periods for coupons would vary in length depending on projected supply conditions and other factors.

1.5 Foreign Visitors

Foreign nationals living in or visiting the United States would be provided allotments of ration coupons only if

they hold U.S. driver's licenses. Foreign persons without U.S. driver's licenses would be able to purchase ration rights in the white market, and visitors would be provided information on rationing as they enter the United States.

1.6 Ration Credits for Firms

Under FEA's proposed rationing plan, firms would receive (in addition to any coupons issued to them as eligible individuals) ration credits based upon their being engaged in certain priority activities. In order to receive ration credits, firms entitled to a ration credit level would establish primary ration credit accounts with an FEA Regional Processing Center through a participating bank based on their base period usage. A firm's allotment of ration credits would be deposited in the firm's primary ration credit account. The firm could then withdraw its ration credits by issuing a ration credit check drawn on its primary account.

The ration credit levels are:[1/]

- 100 percent of current requirements for:
  - Department of Defense use (essential to national defense operations)
  - Agricultural production directly related to food production, and to the transport, processing, and sale of perishable foods (excludes activities relating to fibers, tobacco, and timber)
  - Emergency services (law enforcement, fire fighting, emergency medical services, and others)

1/ For a more detailed description of many of these groups, see Appendix A.

- Passenger surface transportation services, including school buses, but excluding water and rail transportation and vehicles seating 10 or fewer persons.

- 100 percent of base period use for:

  - Telecommunications services (repair, operations and maintenance of various communications services)
  - Sanitation services (water, sewer, and solid waste)
  - Energy production (gasoline use directly related to energy exploration, production, and distribution)

- 90 percent of base period use for:

  - All other government (Federal, State, and local) uses
  - All other uses by firms which report gasoline purchases as an expense to the Internal Revenue Service (IRS)
  - All uses for religious, charitable, educational or other eleemosynary purposes not otherwise accorded a ration credit level

1.7 State Hardship Reserve

The States would be given an allotment each ration period, called the State Hardship Reserve, for use in meeting the hardship needs of firms and individuals. The size of the

Reserve for each ration period would be three percent of the total available supply of gasoline, apportioned among the States according to population and other relevant factors. The Reserve will be administered by a State Rationing Office which would provide allotments for distribution by Local Rationing Boards, to the following classes of individuals:

- Handicapped persons whose gasoline needs exceed their basic allotment, if any, for reasons related to their handicaps.
- Low-income, long-distance commuters who without a hardship allotment would be forced to spend over five percent of their adjusted gross income purchasing ration rights for travel to and from their place of employment, and for whom carpooling or public transportation is not a reasonable alternative.
- Migrant workers who hold a driver's license issued by a State and who travel from one agricultural work site to another agricultural work site.
- Persons engaged in household moves who are driving vehicles as part of their own household moves and who without a hardship allotment would be forced to use over 25 percent of their total household basic allotments for one ration period in order to complete their moves.
- Other recurring or one-time hardship needs which a Local Board considers to be consistent with the objectives of the gasoline rationing program.

2. The Diesel Fuel Plan

2.1 Introduction

In the event of a severe interruption in supplies of imported crude oil, it is anticipated that shortages of diesel fuel would not be as severe as gasoline shortages, principally because refinery yield would probably be altered to increase middle distillate production and reduce gasoline production. It is unlikely that the shortage of middle distillate fuels, including diesel fuel, would ever exceed 10 percent of normal consumption. In light of these shortage projections, it is unlikely that diesel fuel rationing would ever be necessary, even if gasoline rationing were imposed.

FEA believes that the current allocation regulations affecting all middle distillates would provide an adequate means of rationing approximately 70 percent of all diesel fuel, and that, therefore, a less comprehensive rationing plan for diesel fuel would be more appropriate. Consequently, FEA's diesel fuel rationing plan would be achieved through controls of retail sales only, leaving wholesale purchases under the control of the Middle Distillate Allocation Program.

2.2 Summary of Plan Operation

All retail sales of diesel fuel would take place as follows:

- Eligible individuals would use their allotments of gasoline ration coupons for their diesel fuel requirements. This would assure equity between drivers of gasoline-powered and diesel-powered automobiles.

- Firms having an allocation level under the Middle Distillate Allocation Program and which operate diesel-powered vehicles would be issued a diesel fuel entitlement card by FEA for their ration rights, (similar to a regular credit card) for each such vehicle, to be used at the time of purchase of diesel fuel at a retail pump. The entitlement card would be linked to a ration credit account maintained by FEA for each firm purchasing diesel fuel at retail sales outlets. FEA would post ration credits each period to each diesel fuel ration credit account, representing the account owner's retail ration entitlement for that period.

Retail sales outlets would be required to submit the ration coupons and/or entitlement card imprinted slips to FEA each month. At the same time, they would submit reports balancing total diesel sales with the total value of the accompanying ration rights. Slips imprinted with the diesel card will be charged against the balance of diesel fuel credits in each user's account.

2.3 Diesel Fuel Allocation Levels

- Eligible individuals would use gasoline ration rights to purchase diesel fuel and are not assigned allocation levels.
- Firms will be given an allocation level (ration credits) for purchases at retail sales outlets comparable to what they would be entitled to receive under the Middle Distillate Allocation Program if they were purchasing from a supplier as wholesale purchaser-consumers or bulk end-users.

2.4 Operation of the System

Each individual purchasing diesel fuel at retail sales outlets would use his or her gasoline ration coupons.

Each firm which wishes to purchase diesel fuel at retail sales outlets would be required to fill out a form prior to the start of diesel fuel rationing showing total base period purchases of diesel fuel and the volume purchased at retail sales outlets.

FEA would establish a ration credit account for each firm and would credit to each account an amount of ration credits equal to the amount of diesel fuel purchased at retail sales outlets for each base period multiplied by the appropriate allocation level then applicable under the Middle Distillate Allocation Regulations.

3. Cost and Funding of Gasoline and Diesel Fuel Rationing Plan

The annual operating cost of the gasoline rationing program is estimated to be approximately 1.9 billion 1975 dollars. In addition, the implementation costs are estimated to be approximately 360 million 1975 dollars.

FEA will reimburse the cost of gasoline rationing program activities borne by the Coupon Issuance Points, participating commercial banks, State and local governments, and other organizations which FEA authorizes to administer the program. A fee will be collected by FEA on each gallon of gasoline sold, to recover the total cost of the gasoline rationing program from the public. It should be noted that the costs are recovered through a fee (for services rendered) and not through taxes. The fee

would be equal to approximately 2 cents per gallon of gasoline sold, collected from gasoline wholesalers at the same time, and through the same IRS procedures, as are used for the Federal excise tax on gasoline. The IRS will transfer these revenues to FEA.

In addition to the fee described above, a total markup of about 0.4 cents per gallon of gasoline would be permitted for suppliers to recover their direct costs associated with the handling, cancelling, and depositing of ration rights and redemption checks.

The total cost of the diesel fuel rationing system is estimated to be less than 50 million dollars per year. This relatively low cost (compared with gasoline rationing) is due in large part to the fact that many of the supporting functions for retail diesel fuel rationing would be carried out by either the gasoline rationing system (e.g., State Rationing Offices, Local Rationing Boards, and ration coupon issuance for eligible individuals) or by the Middle Distillate Allocation Program (e.g., audit of suppliers).

The collection of fees incident to administration of the diesel fuel rationing program would be through mechanisms similar to those established for gasoline rationing.

In compliance with the terms of the EPCA, FEA will collect no taxes. Further, the total amount of the fee collected will not exceed the cost of the gasoline rationing program. FEA will make periodic adjustments of the fee as necessary to equal actual program costs.

APPENDIX A

DEFINITIONS

APPENDIX A: DEFINITIONS

Agricultural Production. (a) All of the activities classified under the industry code numbers specified below, as set forth in the Standard Industrial Classification Manual, 1972 Edition:

011	Cash Grains (excluding 0119, Cash Grains Not Elsewhere Classified)
0133	Sugar Crops
0134	Irish Potatoes
016	Vegetables and Melons
017	Fruits and Tree Nuts (excluding Vineyards)
0182	Food Crops Grown Under Cover
021	Livestock, except Dairy, Poultry, and Animal Specialties (excluding 0214, Sheep and Goats)
024	Dairy Farms
025	Poultry and Eggs
091	Commercial Fishing (excluding 0919, Miscellaneous Marine Products)
201	Meat Products
202	Dairy Products (excluding 2024, Ice Cream and Frozen Desserts)
203	Canned and Preserved Fruits and Vegetables
2041	Flour and Other Grain Mill Products
2043	Cereal Breakfast Foods
2044	Rice Milling (except Brewers' Rice)
2045	Blended and Prepared Flour
205	Bakery Products (except dessert products such as pastries, pies, cookies and cakes)
2061	Cane Sugar, Except Refining Only
2062	Cane Sugar Refining
2063	Beet Sugar
209	Miscellaneous Food Preparations and Kindred Products;

(b) The following activities classified in the industry code numbers specified below, but only to the extent that they relate to food for human consumption:

0119	Cash Grains, Not Elsewhere Classified
0139	Field Crops, Except Cash Grains, Not Elsewhere Classified
0181	Ornamental Floriculture and Nursery Products (limited to vegetable seed production and growing of fruit stocks)
019	General Farms, Primarily Crop
0214	Sheep and Goats

027	Animal Specialties
029	General Farms, Primarily Livestock
071	Soil Preparation Services
072	Crop Services
0741	Veterinary Services for Livestock, Except Animal Specialties
0751	Livestock Services, Except Services for Animal Specialties
076	Farm Labor and Management Services
0849	Gathering of Forest Products, Not Elsewhere Classified (limited to gathering of maple sap)
0919	Miscellaneous Marine Products
092	Fish Hatcheries and Preserves
147	Chemical and Fertilizer Mineral Mining
2046	Wet Corn Milling
2048	Prepared Feeds and Feed Ingredients for Animals and Fowls, Not Elsewhere Classified
207	Fats and Oils
2819	Industrial Inorganic Chemicals, Not Elsewhere Classified
286	Industrial Inorganic Chemicals (limited to pesticides and intermediates for the manufacture of pesticides)
287	Agricultural Chemicals
421	Trucking, Local and Long Distance (limited to trucking of fresh produce, perishable foods, livestock, and poultry)
497	Irrigation Systems

Allotment. The value in gallons of gasoline or diesel fuel of the ration rights issued to an eligible individual or any firm.

Base Period. The calendar month in the base year corresponding to the current calendar month.

Base Year. A calendar year to be determined by FEA and published in the Federal Register.

Department of Defense Use. Those activities of the United States armed forces directly connected with and essential to national defense operations excluding administrative activities.

Diesel Fuel. No. 2-D diesel fuel as defined in American Society of Testing and Materials (ASTM) D975-71 and No. 1-D diesel fuel as defined in ASTM D975-71. Excluded from the definition is No. 4-D diesel fuel as defined in ASTM D975-71.

Eligible Individual. (a) A natural person having a valid motor vehicle operator's permit, other than a learner's permit, issued by a State in his or her name, (b) An Indian residing on a reservation under the jurisdiction of the Bureau of Indian Affairs of the Department of the Interior who has no State driver's permit but who is permitted by the Bureau of Indian Affairs to drive a motor vehicle on the reservation, and (c) an Alaska Native of age sixteen (16) or over who has no driver's permit but who uses gasoline in a snowmobile, boat, or other vehicle or tool, (d) any natural person designated as an eligible individual by the FEA.

Emergency Services. Fire fighting, emergency police activities (excluding routine activities), emergency medical services, emergency repair of essential public utilities, and emergency road services including snow removal.

Energy Production. The exploration, drilling, mining, refining, processing, production and distribution of coal, natural gas, shale oil, nuclear fuels and electrical energy. It also includes the construction of facilities and equipment used in energy production, such as pipelines, mining equipment and similar capital goods. Excluded from this definition is synthetic natural gas manufacturing.

FEA. The Federal Energy Administration.

Firm. Any association, company, corporation, estate, individual, joint-venture, partnership, or sole proprietorship or any other entity however organized including charitable, educational, or other eleemosynary institutions, State and local governments and the various departments, agencies, offices, corporations, and other instrumentalities of the Federal government. The FEA may, in regulations and forms issued in this part, treat as a firm:

(a) A parent and the consolidated and unconsolidated entities (if any) which it directly or indirectly controls, (b) a parent and its consolidated entities, (c) an unconsolidated entity, or (c) any part of a firm.

Gasoline. A mixture of volatile hydrocarbons, suitable for operation of an internal combustion engine, whose major components are hydrocarbons with boiling points ranging from 140^0 to 390^0 F and whose source is distillation of petroleum and cracking, polymerization, and other chemical reactions by which the naturally occurring petroleum hydrocarbons are converted to those that have superior fuel properties. Excluded from the definition is aviation fuel as defined in 10 CFR 211.142.

Handicapped Person. Any individual who, by reason of disease, injury, age, congenital malfunction, or other permanent incapacity or disability, is unable without special facilities, planning or design to utilize mass transportation vehicles, facilities and services, and who has a substantial, permanent impediment to mobility. (EPCA Section 203(a)(2)(B).)

Individual. A natural person.

Local Rationing Board or Local Board. The group consisting of the Local Rationing Panel, the Local Rationing Board Manager and the Local Rationing Board Staff.

National Ration Reserve. The ration rights reserved by FEA for each ration period for distribution to meet special or urgent needs during that ration period.

Passenger Transportation Services. (a) Surface passenger-carrying services and facilities (excluding water and rail transportation) which serve the general public, whether publicly or privately owned, excluding vehicles with a manufacturer's seated-capacity rating of ten (10) or fewer persons, counting the driver; (b) bus transportation of pupils to and from school.

Ration Period. The time span between the date one ration coupon series becomes valid and the date the immediately following ration coupon series becomes valid.

Ration Rights. Ration coupons and ration credits which shall be evidence of an eligible individual's or firm's right to purchase specified volumes of gasoline and diesel fuel.

Retail Sales Outlet. A site on which a supplier maintains an ongoing business of selling any rationed product to any ultimate consumer, provided that the major activity of the supplier is to supply during the course of any single transaction 130 gallons or less of a rationed product into supply tanks on a vehicle for use as fuel for that vehicle.

Sanitation Services. The collection and disposal for the general public of solid wastes, whether by public or private entities,

and the maintenance, operation and repair of liquid purification and waste facilities. Sanitation services also includes the provision of water supply services by public utilities, whether privately or publicly owned or operated.

State. Any one of the fifty States, the District of Columbia, Puerto Rico or any territory or possession of the United States.

State Hardship Reserve. The ration rights provided to the State Rationing Offices by FEA for distribution within the States to meet the hardship needs of firms (including individuals) having needs for rationed products in addition to the amounts, if any, allotted to such firms.

State Rationing Office. The office established by the Chief Executive of each State to carry out the authorities delegated to that office by FEA.

Supplier. Any firm or any part or subsidiary of any firm other than the Department of Defense which presently, during the base period, or during any period between the base period and the present supplies, sells, transfers or otherwise furnishes (as by consignment) any allocated or rationed product to wholesale purchasers or end-users, including, but not limited to refiners, importers, resellers, jobbers, and retailers.

Telecommunications Services. The repair, operation, and maintenance of voice, data, telegraph, video, and similar communications services to the public by a communications common carrier, excluding sales and routine administrative activities.

Vehicle Rental Company. A firm which rents or leases motor vehicles to other firms (including individuals) who are bailees of the motor vehicles for the period of the rental or lease.

C. DESCRIPTION OF THE BASELINE ENVIRONMENT

1. Overview

This Environmental Assessment compares the impacts of the proposed rationing program to the environment existing just prior to rationing, referred to as the "baseline" environment. The analysis of impacts in Part D is keyed to this "baseline" and not to the normal environment existing prior to an embargo. It is important to note that while an embargo will have enormous impacts on the United States, and that many of these impacts will be continued in whole or in part during rationing, these impacts are not due to or generated by rationing.

The pre-rationing baseline for this Environmental Assessment is an environment in which the shortages of petroleum products have affected almost all sectors of the economy. Some sectors such as the travel and recreation industries are experiencing very sharp reductions in sales, while other sectors, such as agricultural production are experiencing only mild cutbacks in sales due to slightly lower domestic demand during an embargo. During the embargo or the baseline environment, motorists are generally forced to wait in long lines to buy gasoline at stations, and many retail stations are open for only a few hours per day.

The physical environment of the baseline has generally benefitted from the oil shortage which has resulted in improved air quality: automobile emissions are reduced 15 to 20 percent below "normal" levels, and the economic recession triggered by the embargo has significantly reduced industrial air and water pollutant emissions as the entire economy produces less.

Many details of this baseline environment can only be estimated within broad ranges, since the detailed effects of an embargo elude precise measurement even with current econometric models used to predict the reaction of the U.S. economy to changes in specific inputs or in total final demand. The experience of the 1973-74 oil import embargo provides some insight into the response of the economy to sudden oil shortages, but significant changes in energy consumption patterns since 1974 make even this experience an imprecise guide to the future.

The complete list of baseline conditions associated with the oil embargo is potentially very long, including such detailed conditions as the ratio of large to small cars purchased, the increased demand for bicycles, the reduction of noise in cities, and so on. These conditions are not presented in this Environmental Assessment, however, because they are unchanged by the rationing plan.

In Sections 4, 5, and 6 of this part, several specific baseline indicators are described. These indicators or factors have been selected because the imposition of rationing impacts them.

2. Federal Actions in an Embargo Prior to Rationing

The proposed Rationing Plan states that rationing would be used only as a last resort in a new embargo, preceded by other, less drastic Federal programs designed to constrain the demand or increase the supply of petroleum products. Federal actions which are assumed to be implemented in this baseline environment are:

- Appeals for voluntary gasoline conservation, with specific suggestions for saving energy.

- Implementation (or reaffirmation) of price controls and allocation regulations for crude oil and all petroleum products.

- Gradual partial drawdown of strategic petroleum reserves (if available).

- Imposition of mandatory conservation regulations such as the following specific plans:

  - Emergency Heating, Cooling, and Hot Water Restrictions.

  - Emergency Commuter Parking Management and Carpooling Incentives.

  - Emergency Weekend Gasoline and Diesel Fuel Retail Distribution Restrictions.

  - Emergency Boiler Combustion Efficiency Requirements.

  - Emergency Restrictions on Illuminated Advertising and Certain Gas Lighting.

3. Measurement of Specific Baseline Conditions

The following sections list many of the conditions expected to characterize the pre-rationing baseline environment. Because of the lack of adequate estimating techniques, most of these conditions are stated without quantitative measurement. Some conditions are accompanied by estimated quantitative ranges or levels, especially where the levels are directly proportional to specific levels of gasoline shortages. Only a few of the conditions listed below lend themselves to detailed quantitative measurement, but even in these cases the estimated levels are highly speculative, contingent on a number of assumptions which

cannot be considered certain in any future oil import embargo. This analysis assumes that the embargo occurs in 1977.

4. Physical Environment Conditions During Baseline

4.1 Automobile Pollutant Emissions

Exhibit 1 indicates automobile emissions at two stages -- current, and during an embargo. It is assumed that during an embargo gasoline supplies are reduced by 17 percent below "normal' levels. Total air pollutant emission levels in each State are reduced between 0 and 16 percent, depending on the type and location of the pollutant.

The reduction in diesel fuel during an embargo is not expected to be nearly as large as that of gasoline. Current estimates are that the shortfall would never exceed 10 percent, and is more likely to be approximately 8 percent. Diesel vehicle emissions would therefore drop by a similar amount.

Because of panic buying and the difficulty in obtaining gasoline, long lines will form at open gasoline stations. The result of these lines will be a localized buildup of pollutants from the increased number of standing automobiles with their engines running. Somewhat offsetting this short term, localized buildup of pollutants will be the fact that stations will general be open shorter hours than normal.

4.2 Total Industrial Air and Water Pollution Levels

Total industrial pollution levels are assumed to decline during an embargo in direct proportion to the GNP decline caused by the embargo. The GNP decline is related to the lack of petroleum products in the economy.

EXHIBIT 1

AUTOMOBILE EMISSIONS BY STATE: CURRENT AND DURING AN EMBARGO

(Embargo Assumes 17 Percent Reduction in Gasoline Supplies)

State	Total Pollutants (Tons Per Year) 1/				
	Particulates	Sulfur Oxides	Nitrogen Oxides	Hydrocarbons	Carbon Monoxide
Alabama	1,299,231	973,044	437,693	709,238	2,078,581
Alaska	15,336	6,475	36,108	31,293	184,480
Arizona	80,121	1,851,627	136,544	209,418	898,884
Arkansas	151,917	44,008	186,278	215,544	929,473
California	1,109,423	433,568	1,833,297	2,381,775	9,080,474
Colorado	221,748	54,220	162,586	213,249	965,383
Connecticut	44,174	185,263	171,775	242,135	989,413
Delaware	40,574	230,725	64,383	70,442	225,122
District of Col.	21,441	66,833	51,615	46,064	210,358
Florida	249,629	989,193	710,764	683,292	2,971,630
Georgia	445,966	520,752	407,653	504,870	2,244,317
Hawaii	67,925	50,685	48,754	98,690	303,759
Idaho	61,177	59,951	53,519	92,848	378,886
Illinois	1,259,972	2,252,044	1,074,061	2,012,725	7,068,812
Indiana	824,975	2,260,335	1,511,526	661,913	3,233,939
Iowa	238,643	312,413	267,337	349,010	1,588,013
Kansas	383,991	95,872	257,926	341,312	1,104,929
Kentucky	602,098	1,325,890	462,025	359,646	1,311,676
Louisiana	419,486	183,716	466,076	2,166,065	6,210,231
Maine	54,184	159,711	84,592	135,494	414,685
Maryland	545,557	463,012	292,337	326,137	1,390,901
Massachusetts	105,998	701,584	368,590	485,547	1,854,328
Michigan	778,145	1,617,019	2,449,819	791,339	3,575,375
Minnesota	293,468	431,701	343,738	452,691	1,940,894
Mississippi	185,580	55,767	190,170	215,998	913,920
Missouri	223,146	1,270,274	494,166	455,398	2,044,678
Montana	300,587	960,372	163,588	299,635	673,579
Nebraska	105,092	63,950	112,378	140,899	627,790
Nevada	103,661	336,041	98,032	59,164	237,825
New Hampshire	16,446	95,456	74,195	97,520	282,611
New Jersey	167,296	511,181	539,268	903,324	3,171,701
New Mexico	113,301	489,768	219,559	167,614	555,839
New York	176,418	381,377	631,019	1,391,344	5,381,398
North Carolina	530,231	521,415	454,813	492,995	1,911,846
North Dakota	87,058	86,571	94,477	77,480	351,284
Ohio	1,946,743	3,285,255	1,214,163	1,271,508	5,738,323
Oklahoma	103,171	144,078	245,470	376,283	1,605,656
Oregon	186,785	40,539	149,637	258,678	1,024,320
Pennsylvania	1,995,843	3,228,821	3,326,053	983,000	4,111,434
Puerto Rico	79,646	171,501	88,106	124,783	453,985
Rhode Island	14,410	72,489	51,772	72,568	312,671
South Carolina	219,103	273,189	574,904	1,000,715	4,654,143
South Dakota	57,691	19,129	54,553	99,735	426,987
Tennessee	451,621	1,300,707	470,085	400,060	1,619,574
Texas	605,609	830,148	1,437,195	2,445,909	7,603,466
Utah	79,027	168,131	89,285	108,337	443,710
Vermont	16,079	19,567	26,771	46,275	165,909
Virginia	526,347	493,167	363,167	407,211	1,706,412
Washington	178,502	300,921	207,150	379,904	1,828,863
West Virginia	235,580	747,751	253,088	128,039	544,778
Wisconsin	453,665	785,279	450,332	577,534	1,744,814
Wyoming	83,144	76,494	79,997	60,979	334,328

1/ Information derived from 1972 EPA statistics on air quality; National Emissions Report, EPA-450/2-74-012, June 1974.

EXHIBIT 1 (continued)

State	Embargo Related Pollutant Reductions 2/ (Rounded to Nearest Tons Per Year)				
	Particulates	Sulfur Oxides	Nitrogen Oxides	Hydrocarbons	Carbon Monoxide
Alabama	1,212	727	19,238	40,457	209,072
Alaska	58	35	990	2,403	13,201
Arizona	690	414	11,449	25,390	134,585
Arkansas	738	444	12,421	25,550	123,742
California	6,617	3,976	106,584	242,769	1,328,030
Colorado	780	469	12,529	27,746	148,084
Connecticut	876	525	13,896	30,526	164,140
Delaware	191	114	3,873	7,317	32,184
District of Col.	166	99	2,628	5,973	33,182
Florida	2,333	1,400	36,883	81,188	439,200
Georgia	1,764	1,060	29,396	62,761	320,209
Hawaii	175	105	2,790	6,238	34,056
Idaho	270	162	4,380	9,012	44,215
Illinois	2,989	1,798	48,801	110,000	590,191
Indiana	1,918	1,154	32,166	70,984	370,008
Iowa	1,124	678	19,245	43,900	228,674
Kansas	783	472	12,884	27,467	137,214
Kentucky	997	600	16,953	34,971	169,393
Louisiana	1,242	747	20,005	43,726	229,834
Maine	374	224	5,792	11,106	51,604
Maryland	1,097	659	17,422	38,053	203,490
Massachusetts	1,505	903	23,669	52,969	291,050
Michigan	2,613	1,571	43,160	96,169	509,343
Minnesota	1,494	898	24,198	53,191	278,921
Mississippi	748	449	11,869	24,280	122,169
Missouri	1,705	1,025	27,460	60,758	322,849
Montana	278	167	4,508	9,777	50,627
Nebraska	548	329	8,903	19,497	101,565
Nevada	207	124	3,337	6,998	35,220
New Hampshire	284	171	4,406	8,482	39,604
New Jersey	2,131	1,279	33,834	74,925	405,238
New Mexico	486	292	8,704	16,557	81,491
New York	4,214	2,532	70,783	156,487	823,527
North Carolina	1,694	1,017	26,963	55,435	279,119
North Dakota	272	164	4,521	10,208	51,821
Ohio	3,304	1,987	55,164	123,264	651,847
Oklahoma	1,059	636	16,962	37,054	196,038
Oregon	723	434	11,983	25,683	132,346
Pennsylvania	3,269	1,963	52,221	113,588	600,122
Puerto Rico	313	188	5,111	11,022	57,951
Rhode Island	245	147	3,879	8,709	47,895
South Carolina	4,882	2,929	69,981	143,788	751,666
South Dakota	328	198	5,700	12,816	64,953
Tennessee	1,366	821	22,799	46,709	229,064
Texas	4,186	2,518	70,027	140,285	663,447
Utah	397	238	6,108	12,573	62,252
Vermont	179	107	2,850	5,420	24,840
Virginia	1,450	870	23,029	48,372	249,408
Washington	1,132	680	18,894	42,104	222,464
West Virginia	498	299	8,241	16,763	82,726
Wisconsin	1,396	839	22,508	49,139	257,515
Wyoming	148	89	2,275	4,294	19,820

2/ Pre-rationing pollutant loads may be computed by subtracting the pollutant reductions from total pollutants.

EXHIBIT 1 (continued)

State	Total Pollutants -- Percent Change With a 17% Reduction in Gasoline				
	Particulates	Sulfur Oxides	Nitrogen Oxides	Hydrocarbons	Carbon Monoxide
Alabama	.093	.074	4.395	5.704	10.058
Alaska	.378	.540	2.741	7.679	7.155
Arizona	.861	.022	8.384	12.124	14.972
Arkansas	.485	1.008	6.667	11.853	13.313
California	.596	.917	5.813	10.192	14.625
Colorado	.351	.864	7.706	13.011	15.339
Connecticut	1.983	.283	8.089	12.607	16.589
Delaware	.470	.049	6.015	10.390	14.296
District of Col.	.774	.148	5.091	12.966	15.774
Florida	.934	.141	5.189	11.881	14.779
Georgia	.395	.203	7.211	12.431	14.267
Hawaii	.257	.207	5.723	6.320	11.211
Idaho	.441	.270	8.184	9.706	11.669
Illinois	.237	.079	4.543	5.465	8.349
Indiana	.232	.051	2.128	10.724	11.441
Iowa	.470	.217	7.198	12.578	14.400
Kansas	.203	.492	4.995	8.047	12.418
Kentucky	.165	.045	3.669	9.723	12.914
Louisiana	.296	.406	4.292	2.066	3.700
Maine	.690	.140	6.846	8.196	12.444
Maryland	.201	.142	5.959	11.667	14.630
Massachusetts	1.419	.128	6.421	10.909	15.695
Michigan	.335	.097	1.761	12.152	14.245
Minnesota	.509	.208	7.039	11.749	14.370
Mississippi	.403	.805	6.241	11.240	13.367
Missouri	.764	.080	5.560	13.341	15.789
Montana	.092	.017	2.755	3.262	7.516
Nebraska	.521	.514	7.922	13.837	16.178
Nevada	.199	.036	3.403	11.828	14.809
New Hampshire	1.726	.179	5.938	8.697	14.013
New Jersey	1.273	.250	6.274	8.294	12.776
New Mexico	.428	.059	3.677	9.878	14.660
New York	2.388	.663	11.217	11.247	15.303
North Carolina	.319	.195	5.928	11.244	14.599
North Dakota	.312	.189	4.785	13.175	14.751
Ohio	.169	.060	4.543	9.694	11.359
Oklahoma	1.026	.441	6.910	9.847	12.209
Oregon	.387	1.070	8.008	9.928	12.920
Pennsylvania	.163	.060	1.570	11.555	14.596
Puerto Rico	.392	.109	5.800	8.832	12.764
Rhode Island	1.700	.202	7.499	12.001	15.318
South Carolina	2.228	1.072	12.172	14.368	16.150
South Dakota	.568	1.035	10.448	12.850	15.211
Tennessee	.302	.063	4.849	11.675	14.143
Texas	.691	.303	4.872	5.735	8.725
Utah	.502	.141	6.841	11.605	14.029
Vermont	1.113	.546	10.645	11.712	14.972
Virginia	.275	.176	6.344	11.878	14.615
Washington	.634	.225	9.120	11.082	12.164
West Virginia	.211	.039	3.256	13.092	15.185
Wisconsin	.307	.106	4.998	8.508	14.758
Wyoming	.001	.116	2.843	7.041	5.928

4.3 Consumption of Paper and Other Natural Resources

The yearly consumption of paper products (including paperboard) in the United States is currently about 65,452,000 tons.[1/] It is expected that the level of consumption of paper just prior to an embargo would be higher than the present level, due to normal growth. It is assumed that there would be some reduction in paper consumption due to the embargo-induced decline in the GNP, and that this reduction will approximately offset the growth described above, leaving baseline paper consumption at approximately the same levels as at present.

4.4 Generation of Solid Waste

At present, 135 million tons of solid waste are produced per year in the United States.[2/] Just as for paper, described above, it is assumed that the increases from normal growth (from the present to the time of the embargo) will be approximately offset by the reduction in waste generation caused by the embargo-induced decline in economic activity. The expected net effect is a level of solid waste production close to the present level.

4.5 Fuel Handling Hazards

During the 1973-74 oil embargo, public uncertainty about fuel availability led to increased storage of fuel in homes, automobiles, and businesses. A significant number of explosions and fires were directly related to this fuel storage. It is expected that during the baseline period such fuel storage will again occur, resulting in similar accidents.

1/ American Paper Institute, June 1976.

2/ U.S. Environmental Protection Agency, Solid Waste Programs Division, June 1976.

5. Economic Conditions During Baseline

5.1 Total U.S. Employment

The total employment for the United States in the baseline period is estimated to be 93.26 million persons.[1/]

5.2 Tourism and Travel

The tourism industry will be generally depressed because potential travellers are uncertain as to the availability of gasoline and diesel fuel. Faced with the possibility of being stranded on the highway, many travellers elect to remain at or near home. (In some resort areas close to major population centers, tourism might actually increase due to travellers' preference for short trips over long trips.)

Reduced travel during the embargo will mean that some highway and bridge toll collections are reduced as well.

5.3 Income Transfer Between Income Classes Through White Market Sales

There is no income transfer among income classes through white market sales of ration rights in the baseline period because, prior to rationing, ration rights do not exist.

5.4 Income Transfer Between States Through White Market Sales

There is no income transfer among States through white market sales of ration rights in the baseline period because, prior to rationing, ration rights do not exist.

1/ Chase Econometrics, Inc., for FEA.

5.5 Cost of Retail Purchasing Activities

Public uncertainty about the availability of fuel supplies led to panic buying and tank-topping during the 1973-74 embargo. This led to long lines at retail outlets. Further, the supply shortage, aggravated by panic buying, resulted in many stations closing temporarily. Hence, it was necessary to search for retail outlets which had supplies available. These waiting and searching activities are expected to occur again during a new embargo and represent an inconvenience and an economic loss to all drivers. For firms, this loss results specifically from employee time lost searching for gasoline, and from inefficient use of the firms' vehicles.

6. Social/Quality of Life Conditions During Baseline

Uncertainty as to the availability of fuel and difficulty in obtaining fuel impact peoples' lives in ways which can be described in economic terms (discussed in the previous section). The uncertainty and difficulty have other effects which can best be characterized as having impacts on the social environment and the quality of life. These impacts are discussed in the following subsections.

6.1 Access of Key Public Services to Fuel Supplies

Key public services such as police, fire, and emergency health services, would face some uncertainty of supply during an embargo because of the nature of the allocation program, which may subject customers to changing allocation fractions each month. Supply levels may vary unpredictably, and only a few sectors will be assured of 100 percent of their current needs.

Any threat of reduction of public services caused by reduced or uncertain supplies lowers public morale and increases public anxiety.

6.2 Equity of Distribution

The baseline situation is one in which fuel at retail outlets is received on a "first-come-first-served" basis. Individuals or firms who have more "pull" at particular stations or who have the time or patience to search for and then wait in line for available supplies are the ones that get fuel. These consumers are not necessarily the ones most in need of fuel. Such an erratic distribution process may create additional anxiety in areas where long gasoline lines occur.

6.3 Inconvenience Related to Fuel Acquisition Process

During the 1973-74 embargo the panic that resulted from the gasoline shortage caused extremely long lines at gasoline stations in some parts of the United States, at times amounting to waits of up to several hours. A great deal of time was also spent in locating gasoline stations with fuel available for sale. It is anticipated that during a new embargo a similar situation would develop.

6.4 Unlawful Acts and Violence Resulting from Fuel Acquisition Process

The inconvenience of acquiring gasoline resulted in considerable violence in lines at service stations during the 1973-74 embargo. This violence was directed at other motorists and also at gasoline station attendants and owners. It is assumed that under a new embargo a similar situation would again rapidly develop.

Unlawful acts such as black market dealings with gasoline sales and theft of gasoline supplies from trucks and stations also occurred during the 1973-74 embargo and are expected to occur again under a new embargo, when allocation and price controls would also be in effect.

6.5 Driver's License Applications

There may be a gradual increase in driver's license applications during the baseline as the public realizes that there is a possibility of the imposition of rationing. This may be most evident during the period closest to the decision by the President to ration gasoline and diesel fuel.

D. PROBABLE ENVIRONMENTAL IMPACTS OF THE PROPOSED RATIONING PLAN

1. Overview

The proposed Rationing Plan is a relatively large Federal program, costing approximately 1.9 billion dollars per year to operate, and directly employing approximately 90,000 persons (full-time equivalent employees) in both government and private sector jobs. These expenditures and jobs are spread fairly evenly throughout the country, with some concentration in the 10 cities where FEA regional offices are located and in Washington, D.C.

The impacts of the Rationing Plan described in this part are divided into the same subcategories used in the previous part describing the baseline environment. These categories are grouped into three classes as follows: impacts on the physical environment, economic impacts, and impacts on social/quality of life conditions.

The focus of the impact measurement in this part is the comparison of the rationing plan environment with the baseline environment, which is the environment during an embargo.

2. Physical Environment Impacts of Rationing

2.1 Automobile Pollutant Emissions - Total and By State

The primary effect of white market activities will be to allow fuel usage patterns to adjust towards those existing under pre-rationing conditions. To assess the maximum potential impact of rationing on air pollutant emissions distribution, a hypothetical "worst case" is considered. Under worst case con-

ditions, no ration rights transfers take place. Thus, all drivers consume gasoline and diesel fuel (at retail) only up to the amount of ration rights they receive -- assumed to be 9.2 gallons per week or their usage under pre-rationing conditions, whichever is less.

The use of rationing changes the distribution of automobile-generated air pollutants from that existing under baseline conditions, but the effect on the national total is negligible. Exhibit 2 is a list of gasoline consumption data per licensed driver by State under pre-embargo conditions. Exhibit 3 illustrates State consumption patterns during an embargo with rationing. States such as Alabama where, under baseline conditions, gasoline consumption per licensed driver per week is greater than the 9.2 gallon allotment under rationing, would (in the absence of white market transfers) experience reductions in total gasoline consumption and, therefore, in pollutants as well.

Some States, such as California, would have more gasoline available under rationing and pollution levels would increase relative to baseline conditions. Other States, such as Alaska, Hawaii, Kansas, and Nevada would be able under rationing to resume the same gasoline and diesel fuel usage that existed prior to the embargo. The reason for this is that those States will receive coupons that will be in excess of their gasoline and diesel fuel needs. It is likely that these "extra" coupons would be available for sales to other individuals in other States where gasoline usage and demand is much higher (see Exhibit 3).

However, since rationing would not increase the consumption of gasoline and diesel fuel above normal conditions, no State would experience a greater level of pollution due to rationing than existed prior to the embargo. The largest percentage increase in gasoline use relative to baseline conditions

EXHIBIT 2

GASOLINE CONSUMPTION PER LICENSED DRIVER BY STATE

State	1973 Gasoline Consumption (in 1000 gal.)	Estimated Private Use (in 1000 gal.) 1/	Out-of-State Driver Travel Gasoline Consumption (in 1000 gal.)	Estimated Net Private Consumption (in 1000 gal.)	Number of Licensed Drivers (in thousands)	Licensed Driver	
						Annual Gallons	Average Weekly
Alabama	1,823,039	1,316,224	24,531	1,291,693	1,851	698	13.4
Alaska	107,689	77,536	571	76,965	161	478	9.2
Arizona	1,152,555	829,840	62,776	767,064	1,222	628	12.1
Arkansas	1,129,609	813,318	41,057	772,261	1,203	642	12.4
California	10,102,925	7,274,106	37,338	7,236,768	12,775	565	10.9
Colorado	1,294,033	931,704	53,702	878,002	1,611	545	10.5
Connecticut	1,329,756	957,424	24,430	932,994	1,803	516	9.9
Delaware	300,235	216,169	9,491	206,678	371	557	10.7
District of Columbia	251,278	180,920	39,425	141,495	335	422	8.1
Florida	4,170,530	3,002,782	127,908	2,874,874	4,759	604	11.6
Georgia	2,781,135	2,002,418	46,792	1,956,626	3,339	585	11.3
Hawaii	273,498	196,919	2/	196,919	475	415	8.0
Idaho	424,843	305,887	10,670	295,217	539	547	10.5
Illinois	4,807,790	3,461,609	48,705	3,412,904	6,124	557	10.7
Indiana	2,732,472	1,967,380	79,677	1,887,703	2,959	638	12.3
Iowa	1,566,149	1,127,627	47,223	1,080,404	1,781	607	11.7
Kansas	1,201,360	864,979	156,383	708,596	1,594	445	8.6
Kentucky	1,653,995	1,190,876	70,217	1,120,659	1,722	651	12.6
Louisiana	1,714,938	1,234,755	107,826	1,126,929	2,016	559	10.8
Maine	524,885	377,917	15,652	362,265	595	609	11.7
Maryland	1,309,456	1,302,303	17,683	1,285,125	2,218	579	11.7
Massachusetts	2,352,302	1,693,657	35,895	1,657,762	3,209	517	9.9
Michigan	4,523,949	3,257,243	60,595	3,196,648	5,436	583	11.3
Minnesota	1,944,833	1,400,280	21,683	1,378,597	2,384	578	11.1
Mississippi	1,181,499	850,679	32,024	818,655	1,379	594	11.4
Missouri	2,492,880	1,794,874	65,260	1,729,614	2,875	602	11.6
Montana	432,272	311,236	19,188	292,048	462	632	12.2
Nebraska	856,313	616,545	14,599	601,946	1,037	554	10.7
Nevada	373,682	269,051	86,295	182,756	389	470	9.0
New Hampshire	393,313	233,185	25,008	258,177	505	511	9.8
New Jersey	3,180,680	2,290,090	31,929	2,258,161	4,342	520	10.0
New Mexico	673,934	485,232	42,856	442,376	666	644	12.8
New York	5,980,989	4,305,312	64,961	4,241,351	8,546	595	9.5
North Carolina	2,743,015	1,974,971	73,563	1,901,408	3,060	621	12.0
North Dakota	320,175	230,525	9,113	221,413	354	625	12.0
Ohio	4,968,581	3,577,378	91,490	3,485,888	6,294	554	10.7
Oklahoma	1,557,849	1,112,165	48,547	1,063,618	1,674	635	12.2
Oregon	1,191,103	857,598	48,171	809,427	1,497	541	10.4
Pennsylvania	4,761,950	3,428,604	97,122	3,331,482	5,574	507	9.8
Rhode Island	361,125	260,010	7,248	252,762	558	453	8.7
South Carolina	1,443,958	1,039,649	4,481	1,035,168	1,416	731	14.1
South Dakota	376,855	271,336	21,930	249,406	417	598	11.5
Tennessee	2,199,125	1,583,370	66,823	1,416,547	2,254	616	13.0
Texas	7,111,664	5,120,393	60,784	5,059,614	6,973	726	14.0
Utah	602,787	434,007	14,919	419,088	665	630	12.1
Vermont	240,300	173,016	32,581	140,435	293	479	9.2
Virginia	2,446,136	1,761,218	79,685	1,681,533	2,856	589	11.3
Washington	1,654,715	1,191,395	5,627	1,185,768	2,145	553	10.5
West Virginia	769,631	554,134	17,777	536,357	1,051	510	9.8
Wisconsin	2,077,189	1,495,576	59,108	1,436,468	2,594	554	10.7
Wyoming	266,255	191,704	24,017	167,687	224	749	14.4

1/ Estimated at 72% of total consumption.

2/ Nil.

Source: U.S. Department of Transportation, Federal Highway Administration, "1973 Highway Statistics," Washington, D.C., 1973.

EXHIBIT 3

IMPACT OF RATIONING ON GASOLINE CONSUMPTION: A WORST CASE ANALYSIS

State	(A) Average Weekly Pre-Embargo Use Per Licensed Driver (Gallons)	(B) Weekly Use Under Embargo (17% Reduction) (Gallons)	(C) Weekly Allotment 1/ (Gallons)	(D) Maximum Change in Usage Due to Rationing 2/ (Gallons)	(Percent)
Alabama	13.40	11.10	9.20	-1.90	-17.10
Alaska	9.20	7.60	9.20	1.60	21.10
Arizona	12.10	10.00	9.20	0.80	- 8.00
Arkansas	12.40	10.30	9.20	1.10	-10.60
California	10.90	9.00	9.20	0.20	2.20
Colorado	10.50	8.70	9.20	0.50	5.70
Connecticut	9.90	8.20	9.20	1.00	12.20
Delaware	10.70	8.90	9.20	0.30	3.40
District of Col.	8.10	6.70	9.20	-1.40	20.90
Florida	11.60	9.60	9.20	-0.40	- 4.20
Georgia	11.30	9.40	9.20	-0.20	- 2.10
Hawaii	8.00	6.60	9.20	1.40	21.20
Idaho	10.50	8.70	9.20	0.50	5.70
Illinois	10.70	8.90	9.20	0.30	3.40
Indiana	12.30	10.20	9.20	-0.10	- 9.80
Iowa	11.70	9.70	9.20	-0.50	- 5.20
Kansas	8.60	7.10	9.20	1.50	21.10
Kentucky	12.60	10.50	9.20	-1.30	-12.40
Louisiana	10.80	9.00	9.20	-0.20	- 2.20
Maine	11.70	9.70	9.20	-0.50	- 5.20
Maryland	11.70	9.70	9.20	-0.50	- 5.20
Massachusetts	9.90	8.20	9.20	1.00	12.20
Michigan	11.30	9.40	9.20	-0.20	- 2.10
Minnesota	11.10	9.20	9.20	0.00	0.00
Mississippi	11.40	9.50	9.20	-0.30	- 3.20
Missouri	11.60	9.60	9.20	-0.40	- 4.20
Montana	12.20	10.10	9.20	-0.90	- 8.90
Nebraska	10.70	8.90	9.20	0.30	3.40
Nevada	9.00	7.50	9.20	1.50	20.00
New Hampshire	9.80	8.10	9.20	1.10	13.60
New Jersey	10.00	8.30	9.20	0.90	10.80

1/ 9.20 gallons weekly allotment based on 17 percent supply reduction. Federal Energy Administration, 1976.

2/ Percent measured relative to usage during an embargo without rationing.

EXHIBIT 3 (continued)

State	(A) Average Weekly Pre-Embargo Use Per Licensed Driver (Gallons)	(B) Weekly Use Under Embargo (17% Reduction) (Gallons)	(C) Weekly Allotment 1/ (Gallons)	(D) Maximum Change in Usage Due to Rationing 2/ (Gallons)	(Percent)
New Mexico	12.80	10.60	9.20	-1.40	-13.20
New York	9.50	7.90	9.20	1.30	16.40
North Carolina	12.00	10.00	9.20	- .80	- 8.00
North Dakota	12.00	10.00	9.20	- .80	- 8.00
Ohio	10.70	8.90	9.20	.30	3.40
Oklahoma	12.20	10.10	9.20	- .90	- 8.90
Oregon	10.40	8.60	9.20	.60	7.00
Pennsylvania	9.80	8.10	9.20	1.10	13.60
Rhode Island	8.70	7.20	9.20	1.50	20.80
South Carolina	14.10	11.70	9.20	-2.50	-21.40
South Dakota	11.50	9.50	9.20	- .30	- 3.20
Tennessee	13.00	10.80	9.20	-1.60	-14.80
Texas	14.00	11.60	9.20	-2.40	-20.70
Utah	12.10	10.00	9.20	- .80	- 8.00
Vermont	9.20	7.60	9.20	1.60	21.10
Virginia	11.30	9.40	9.20	- .20	- 2.10
Washington	10.50	8.70	9.20	.50	5.70
West Virginia	9.80	8.10	9.20	1.10	13.60
Wisconsin	10.70	8.90	9.20	.30	3.40
Wyoming	14.40	12.00	9.20	-2.80	-23.30

1/ 9.20 gallons weekly allotment based on 17 percent supply reduction. Federal Energy Administration, 1976.

2/ Percent measured relative to usage during an embargo without rationing.

due to rationing as opposed to pre-embargo conditions (without coupon sales) would occur in Hawaii where a 21 percent increase in usage would occur. The largest percentage decrease in gasoline consumption due to rationing would be the approximately 23 percent decrease in Wyoming. For a detailed breakdown by State and pollutant, see Exhibit 4.

Because of the increased public confidence in the availability of fuel supplies, the purchases of gasoline are dispersed and people no longer feel the need to keep their tanks full at all times. The resulting decrease in lines at the gasoline pump reduces the emissions of pollutants in the vicinity of retail outlets.

There are approximately 84,000 diesel-powered automobiles (75,000 Mercedes-Benz and 9,000 Peugeot) at present in the United States.[1/] This figure does not account for conversions or installations of diesel engines in other models. A figure therefore of from 84,000 to 100,000 diesel-powered automobiles in the United States at the present, and for the immediate future, appears reasonable. This figure represents less than one percent of all automobiles in the United States and less than one percent of vehicle consumption of diesel fuel (total diesel vehicle consumption was 12 billion gallons in 1974).

Emissions of diesel-powered automobiles are higher in certain categories than gasoline automobiles.[2/] The average emissions for gasoline and diesel cars are shown in Exhibit 5.

1/ Automotive News, June 28, 1976, Detroit, p. 19.

2/ U.S. Environmental Protection Agency, Mobile Source Air Pollution Control, Emission Control Technology Division, Compilation of Air Pollutant Emission Factors, Supplement 5 (AP-42), December 1975.

EXHIBIT 4

MAXIMUM PERCENT CHANGE IN AIR POLLUTANT EMISSIONS DUE TO RATIONING 1/

State	Particulates	Sulfur Oxides	Nitrogen Oxides	Hydrocarbons	Carbon Monoxide
Alabama	- .08	- .07	- 3.60	- 4.80	- 8.40
Alaska	.39	.54	2.80	7.70	7.10
Arizona	- .30	- .01	- 3.23	- 4.70	- 5.80
Arkansas	- .25	- .51	- 3.43	- 6.20	- 6.90
California	.06	.10	.61	1.10	1.60
Colorado	.10	.24	2.10	3.60	4.30
Connecticut	1.20	.17	4.80	7.40	9.80
Delaware	.08	.01	.98	1.70	2.40
District of Col.	.77	.15	5.10	13.00	15.80
Florida	- .19	- .03	- 1.10	- 2.40	- 3.00
Georgia	- .04	- .02	- .80	- 1.30	- 1.50
Hawaii	.26	.21	5.70	6.30	11.20
Idaho	.12	.08	2.30	2.70	3.30
Illinois	.04	.01	.77	.90	1.40
Indiana	- .10	- .02	- 1.00	- 4.90	- 5.40
Iowa	-1.20	- .054	- 1.87	- 3.20	- 3.70
Kansas	.20	.50	5.00	8.00	12.40
Kentucky	- .10	- .03	- 2.20	- 5.90	- 7.70
Louisiana	.03	.04	.46	.22	.40
Maine	- .17	- .03	- 1.70	- 2.00	- 3.10
Maryland	- .05	- .04	- 1.50	- 2.80	- 3.60
Massachusetts	.83	.08	3.80	6.40	9.30
Michigan	- .03	- .01	- .18	- 1.30	- 1.50
Minnesota	0.00	0.00	00.00	00.00	00.00
Mississippi	- .06	- .12	- .90	- 1.80	- 2.10
Missouri	- .16	- .02	- 1.10	- 2.70	- 3.20
Montana	- .03	- .06	- 1.20	- 1.40	- 3.30
Nebraska	.09	.08	1.30	2.30	2.70
Nevada	.20	.04	3.40	11.80	14.80
New Hampshire	1.20	.12	3.90	5.60	9.30
New Jersey	.69	.13	3.30	4.40	6.70
New Mexico	- .28	- .30	- 2.50	- 6.30	- 9.50
New York	1.90	.53	9.00	9.00	12.30
North Carolina	- .12	- .07	- 2.30	- 4.40	- 5.70
North Dakota	- .12	- .07	- 1.90	- 5.20	- 5.80
Ohio	.03	.01	.77	1.60	1.90
Oklahoma	- .45	- .18	- 3.00	- 4.30	- 5.30
Oregon	.13	.36	2.70	3:40	4.40
Pennsylvania	.11	.04	1.00	7.60	9.70
Rhode Island	1.70	.20	7.50	12.00	15.40
South Carolina	-2.40	-1.10	-12.70	-15.10	-16.90
South Dakota	- .09	- .16	- 1.60	- 1.90	- 2.30
Tennessee	- .22	- .04	- 3.60	- 8.40	-10.20
Texas	- .69	- .30	- 5.00	- 5.90	- 8.90

1/ Measured relative to pre-embargo pollutant levels. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. "1972 National Emissions Report." National Emissions Data (NEDS) of the Aerometric and Emissions Reporting System (AEROS), June 1974.

EXHIBIT 4 (continued)

State	Particulates	Sulfur Oxides	Nitrogen Oxides	Hydrocarbons	Carbon Monoxide
Utah	- .19	- .05	- 2.60	- 4.40	- 5.30
Vermont	1.10	.56	10.50	11.70	15.00
Virginia	- .03	- .02	- .70	- 1.30	- 1.50
Washington	.18	.06	2.50	3.10	3.40
West Virginia	.14	.03	2.10	8.70	10.10
Wisconsin	.05	.02	.82	1.40	2.50
Wyoming	0.00	- .13	- 3.20	- 8.10	- 6.90

EXHIBIT 5

COMPARISON OF POLLUTANT EMISSIONS BETWEEN GASOLINE AND DIESEL-POWERED AUTOMOBILES 1/

Pollutant Emissions	Gasoline-Powered Automobiles	Diesel-Powered Automobiles
Particulates	0.34 grams per mile	0.73 grams per mile
Tire Wear	0.20 grams per mile	0.20 grams per mile
Sulfur Oxides (SO_2)	0.13 grams per mile	0.54 grams per mile
Nitrogen Oxides (NO_x)	2.30 grams per mile	1.60 grams per mile
Hydrocarbons (HC)	1.30 grams per mile	0.46 grams per mile
Carbon Monoxide (CO)	22.70 grams per mile	1.70 grams per mile
Aldehydes	.13 grams per mile	>.13 grams per mile
Sulfates (H_2SO_4)	1.0 milligrams per mile (prior to 1975) 7.0 milligrams per mile (after 1975) for non-airpump autos 30.0 milligrams per mile (after 1975) for autos with airpumps	10 milligrams per mile

1/ U.S. Environmental Protection Agency, Mobile Source Air Pollution Control, Emission Control Technology Division, Compilation of Air Pollutant Emission Factors, Supplement 5, (AP-42), December 1975.

Note: Data on particulates and sulfur oxides for gasoline-powered automobiles was obtained from EPA testing completed on 1973 or earlier gasoline-powered automobiles. NO_x, HC and CO data is from recent preliminary EPA testing on 1975 gasoline-powered automobiles. Source: Mobile Source Air Pollution Control, Emission Control Technology Division, U.S. Environmental Protection Agency, Ann Arbor, Michigan, June 1976.

Precise information of the distribution of diesel-powered cars throughout the United States is not available. However, dealers' sales information indicates sales of these cars in all areas of the United States, with a slightly higher incidence of sales in the western coastal areas and affluent metropolitan areas.

Because of the absence of meaningful data on diesel automobile distribution, no figures are currently available on the amount of total diesel pollutants by category by State, as currently exist for gasoline vehicles. However, even without this information it is possible to note that the 100,000 diesel automobiles[1/] represent less than one percent of all automobiles in the United States, and produce a negligible amount of pollution when compared to that produced by gasoline vehicles. For example, if all 100,000 diesel automobiles in the United States each used the maximum average amount of gasoline used per driver per week in the United States (as in Wyoming), the resultant pollutant levels would be:

Particulates	843.5 tons per year
Sulfur Oxides	624.0 tons per year
Nitrogen Oxides	1,849.0 tons per year
Hydrocarbons	531.5 tons per year
Carbon Monoxide	1,964.5 tons per year

Comparing the above figures with the total annual pollution figures found in Exhibit 1 for Wyoming which are:

1/ There appears to be a probable trend towards increased diesel-powered automobiles in the United States. General Motors will manufacture a 1977 model Oldsmobile with a diesel engine. In 1975, International Harvester began producing diesel engines for its passenger Scout line. Current (June 1976) production is up to 10 engines per day and demand is reported to be strong. Nissan Motors of Japan currently distributes a diesel engine for passenger cars through Chrysler Industrial Products Corporation. Automotive News, June 18, 1976, p. 19.

Particulates	83,144 tons per year
Sulfur Oxides	76,494 tons per year
Nitrogen Oxides	79,997 tons per year
Hydrocarbons	60,979 tons per year
Carbon Monoxide	334,328 tons per year

it can be seen that the diesel car contribution (using the hypothetical case of every diesel car being located there and driving the maximum amount) represents at the worst 2.3 percent of the nitrogen oxides produced in the State. The other pollutants represent one percent or less of the other categories.

Realizing that the above calculations group all diesel users together, and that collectively the pollutants are still a small percentage for only one area, it is reasonable to state that the diesel car pollution spread over the entire United States is quite small compared to other sources.[1/]

Further, it is impossible to assume that at the very worst, under rationing, every diesel automobile would have access to 100 percent of their needs for diesel fuel, or the same amount as was consumed prior to an embargo.[2/] Therefore, rationing at its "worst" would bring the pollution from diesel automobiles back to "normal" or pre-embargo levels. This return to normal conditions assumes that during an embargo the United States would experience an overall eight percent reduction in diesel fuels, and a corollary eight percent reduction in emissions.

2.2 Total Industrial Air and Water Pollution Levels

The added certainty of supply caused by rationing slightly increases overall economic activity, since firms are better able

1/ Diesel automobile owners could purchase coupons on the white market, which would change slightly their fuel use and emission levels. Such changes, however, would not be significant.

2/ For purposes of argument, assume that automobiles are using diesel fuel normally consumed by other sources.

to plan their future production, and are able to avoid some lay-offs. As a result of this slight, general increase of overall economic activity, air and water pollution resulting from this activity slightly increases from the baseline. (It should be noted here that industrial pollution is still significantly below pre-embargo levels.)

2.3 Consumption of Paper and Other Natural Resources

Operation of the gasoline and diesel fuel rationing program requires the consumption of large amounts of paper for such uses as coupons, application forms, and audit report forms. The production of 5.3 billion coupons per quarter requires 8,000 tons of paper per year. Assuming that the aggregate amount of paper required for the program is at least four times this amount, or 32,000 tons of paper per year, this figure represents only about 0.05 percent of the total U.S. consumption of paper of 65,452,000 tons per year.[1/] The amount required for rationing is an insignificant amount when compared with normal consumption rates.

An increase in the use of other natural resources results from the production of diesel entitlement cards, and such items as new office furniture and supplies for the various program offices.

2.4 Generation of Solid Waste

The increase in paper consumption from the baseline period level due to rationing program requirements results in a corresponding rise in the generation of solid waste. Assuming the program requires about 32,000 tons of paper per year, this represents only about 0.02 percent of the 135 million tons of solid waste generated per year in the United States, an insignificant amount.[2/]

1/ American Paper Institute, June 1976.

2/ U.S. Environmental Protection Agency, Solid Waste Programs Division, June 1976.

2.5 Fuel Handling Hazards

A significant impact of rationing is the lessening of incentives to store fuel in homes and automobiles. Persons or firms wishing to amass supplies can store ration rights instead. Thus, there are fewer explosions and fires caused by improper storage of fuel supplies in automobiles and homes.

3. Economic Impacts of Rationing

3.1 Total Employment and Production

It is estimated that at a maximum approximately 90,000 new full-time equivalent jobs are created by the operation and administrative requirements of the rationing program. However, due to other employment impacts described below, the estimated net effect of the rationing plan is a gain of approximately 54,000 jobs, or about 0.06 percent of the estimated (baseline employment) level of 93.26 million persons.

Employment decreases in some sectors result from changes in personal and business consumption patterns due to expenditures for coupons (where necessary) and the addition of a fee to the price of gasoline and diesel fuel to fund the program. The greatest employment decrease is in the wholesale and retail sectors.[1/]

Several sectors of the economy experience employment gains due to rationing through the resulting increase in the certainty of fuel supply availability. There are two principal reasons for this increased employment. One, firms may ensure a stable future supply of fuel by either relying on their ration rights allotments or by purchasing additional ration rights on the white market. This allows smoother production planning and

---

1/ Battelle-Columbus Laboratories, 1976.

may make it possible to reduce the number of layoffs caused by short run supply fluctuations. Two, the assurance of being able to purchase fuel promotes stability of the operation of the trucking industry. Firms with ration rights no longer need be concerned with having trucks stranded on highways. The improvement in the operation of the trucking industry has ripple effects through the economy and other sectors should benefit. The rationing program has other effects on particular sectors through the resulting shifts in consumption patterns (for further discussion see Subsection 3.2, "Travel and Tourism.").

Because the economy will be in a depressed state at the time rationing is instituted, there will probably be underemployment (i.e., employees are not used to full capacity) in some sectors. When economic activity is stimulated by rationing, some firms will use existing employees more fully, rather than hiring additional employees to increase production. Thus, the estimated level of new jobs resulting from the program is probably overstated. Further, the creation of new jobs by the rationing program will tend to be offset by transfers among agencies. In the other direction, the employment gains as reported by the Bureau of Labor Statistics are probably greater due to the fact that their employment figures are not expressed in full-time equivalent units, but rather represent the number of persons paid for one or more hours of work during the survey week.

3.2 Travel and Tourism

The tourism industry is stimulated by the increased travelling of the public, resulting from travellers increased confidence, due to the rationing program, that they can purchase fuel away from home. While fuel supplies are still reduced from pre-embargo levels, travellers during rationing can purchase or save enough ration coupons in advance to supply their trip requirements. The increased travel should generate some increases in

highway and bridge toll revenues. An indication of the volume of Canadian and Mexican visitors to the United States is contained in Exhibits B-1 and B-2, Appendix B.

3.3 Income Transfer Among Income Classes Due to White Market Sales[1/]

Each licensed driver receives a fixed allotment of coupons periodically during the life of the rationing program. The result is that some income groups have excess coupons and others do not have enough in order to maintain their preferred level of consumption. Because individuals may use or sell their coupons, the excesses and deficits are exchanged, to better equalize supply and demand. Based on the probable level of shortage and a short run price elasticity of demand for gasoline of -0.12, the market price of coupons is estimated to be around one dollar per gallon. Under these conditions, the exchange of coupons and ration credit checks results in a redistribution of income among consumers and businesses.

Licensed drivers in the lower income groups average higher annual gasoline consumption than their counterparts in higher income groups (see Exhibits B-3 through B-10, Appendix B). In the absence of hardship allotments, coupon transfers among income groups would result in a transfer of at least 1.7 billion dollars per year from the lower income ranges, those families and unrelated individuals with an average income of $6,240 (1975 dollars) per year, to licensed drivers in the remaining classes. However, the receipt of hardship allotments, which go primarily to the lower income classes, should greatly reduce the need of the lowest income group to purchase ration rights on the white market. Thus, the actual income transfer among income classes due to white market sales should be much smaller than 1.7 billion dollars.

1/ Reference copies of "Gasoline and Diesel Fuel Rationing Contingency Plan, Economic Impact Analysis" (FEA, 1976) are available at the FEA Freedom of Information Office, Room 2107, FEA, 12th and Pennsylvania Avenue, N.W., Washington, D.C.

For businesses, a maximum of 10 percent of their gasoline would be obtained by purchase of coupons or ration credit checks valued at about one dollar per coupon gallon. Based on total annual business consumption of gasoline, these purchases would result in a transfer of at least 1 billion dollars per year. The transfers would accrue to both industry and consumers.

3.4 Income Transfer Among States Due to White Market Sales

Because of differences in gasoline consumption per licensed driver among States, the sales of ration rights are expected to create a redistribution of income among States of about 2 billion dollars annually. States with large anticipated purchases of coupons (outflow of income) include Alabama, Indiana, Kentucky, South Carolina, and Texas, all predominantly rural States. States with large anticipated sales of coupons (inflow of income) include California, Connecticut, Illinois, Kansas, New Jersey, Ohio, and Pennsylvania. With the exception of Kansas, these are all States with large urban concentrations. The effects for individual States are shown in Exhibit B-11, Appendix B.

3.5 Cost of Retail Purchasing Activities

Under rationing, the increased public confidence in being able to obtain fuel should result in shorter lines at the pump and reduce the need to engage in search activity to find a retail outlet with available supplies. These two effects of rationing have important consequences for firms. Company motor vehicles and employees are no longer tied up searching for available supplies and then waiting in long lines for gasoline and diesel fuel. Thus, the productivities of both the vehicles and the employees increase. For delivery companies, independent cabs, and companies with fleets of repair and service trucks, the value of these increases can be substantial.

4. Social/Quality of Life Impacts of Rationing

The knowledge that one is assured of a definite, although limited, supply of gasoline and diesel fuel is expected to increase the level of certainty and confidence among U.S. consumers, and will result in consumers (drivers) being able to plan accordingly. This should result in improvement in the social environment in several ways. Some of these impacts are discussed below.

4.1 Access of Key Public Services to Uncertain Fuel Supplies

Under the priority scheme of the rationing program, emergency fire, police, health services, emergency repair of essential public utilities and emergency road services such as snow removal will receive 100 percent of their current requirements. 100 percent of current requirements is also supplied for national defense purposes and food production. The continuation of defense activities at whatever level deemed necessary by the defense establishment would do much to maintain the feeling of a good relative level of security, at a time when political relations may be strained with other countries. Food production and distribution is of essential importance to everyone in the United States, and the availability of food products will ease much of the anxiety that may result from the embargo.

Other services such as telecommunications, water, sewer, and solid waste disposal will receive 100 percent of their base period use, again resulting in a beneficial impact from the service rendered during the baseline when problems may have arisen with obtaining enough fuel for maintenance vehicles or other uses of these public or private activities.

Energy production, which will receive 100 percent of base period use, is more important than ever during an embargo. The continuation of the flow of U.S. fuel supplies is of major importance under rationing.

Continuation of the above key services results in an overall improvement of the public's peace of mind, because these services will not be cut back.

4.2 Equity of Distribution

Under the baseline condition, the distribution of available gasoline and diesel fuel at retail is on a "first-come-first-served" basis. A major impact of rationing is the distribution of fuel supplies equitably among all eligible individuals. The equitability of distribution should ease the tensions experienced under baseline conditions, where retail customers with more "pull" or whose time is "worth" less and are willing to wait for lengthy periods receive fuel supplies first. Further, under rationing the State Hardship Reserves allow those who are in the most need of gasoline and diesel supplies to receive an appropriate amount.

The distribution of ration rights equal to 90 percent of base period use to all firms not included in other classifications results in an improvement of their services and production over the baseline, further improving the social environment and the quality of life.

4.3 Inconvenience Related to Fuel Acquisition Process

Under the baseline conditions, a great deal of time is spent searching for and then waiting in line for fuel supplies. A beneficial impact of rationing is the introduction of a greater

certainty of gasoline and diesel supply, although there may still be a minor amount of inconvenience in locating stations with supplies. Because individuals and firms are assured of receiving fuel for which they hold ration rights, there should not be the panic buying which lead to excessively long lines at the fuel pump. There should be a significant improvement in the attitude of the population, due to the increased availability and lessened inconvenience in procuring gasoline and diesel fuel.

Rationing introduces a number of activities which are time-consuming for the user of gasoline and diesel fuel, resulting in a certain amount of personal inconvenience. This inconvenience could manifest itself at Coupon Issuance Points as confusion, time spent acquiring and filling out forms, waiting lines and delays relating to all of the above in terms of receiving ration rights. This inconvenience would not have existed during the baseline period. There is also likely to be an increase in waiting time at the Department of Motor Vehicles for the processing and receipt of new and renewed driver's licenses. (This problem is further described in Subsection 4.5, "Applications for Driver's Licenses.") Firms applying for ration credits may need to institute special methods for keeping track of fuel receipts and use records, and for the dispersion of ration credits from primary to secondary accounts.

Some amount of inconvenience could also be associated with the actual use of coupons, ration credit checks, and diesel fuel entitlement cards by consumers at retail stations and for wholesale acquisitions of gasoline, due to the need for the supplier to complete a series of new operations such as stamping the coupon or check. However, it is anticipated that the level of inconvenience from this aspect of the rationing plan would be relatively small and have a limited impact.

4.4 Unlawful Acts and Violence Resulting from Fuel Acquisition Process

The imposition of the gasoline and diesel fuel rationing plan should result in a significant decline in the violence which is expected to occur at times, associated with acquiring fuel.[1/] Because the long lines at the pumps generally disappear, the associated violence with these lines at the stations also generally ceases.

Off-site violence such as thefts from gasoline and diesel depots and trucks should be lowered, but not to as great a degree as the violence associated with the long lines. Because of the relative "scarcity" of fuel, individuals will still be tempted to acquire a supply in an illegal manner. The freedom to buy and sell ration rights should tend to reduce such acts.

Rationing will introduce a variety of illegal, but nonviolent "white collar" crimes. These acts include counterfeiting and theft of ration coupons, ration credit checks, and entitlement cards; applications for ration rights, using more than one driver's license; application for a ration allotment by nonexistent firms; application for ration allotments that are in excess of true base period uses; attempted reuse of cancelled or redeemed ration rights; and overdrawing of ration credit accounts.

4.5 Driver's License Applications

It is anticipated that the number of driver's license applicants will increase under rationing due to the monetary

---

1/ Meaningful quantitative measures of violence during the 1973-74 embargo are not available. However, it is known that long lines at gasoline pumps at that time did generate some instances of violence in Washington, D.C., New York City and Chicago.

value of the coupon allotment each licensed driver receives. There are approximately 32 million Americans over 15 years of age who do not have licenses. As many as 15 million or about 50 percent (making allowances for handicapped, aged, and other persons not likely to seek licenses) of these people might apply. This would create a large temporary burden on State and local licensing facilities (see Exhibit B-12, Appendix B). For example, the State of Maryland processed a total of about 194,000 applications in 1974 but might be faced with 373,000 new applicants if rationing allotments become sufficiently valuable. This burden would result in delays in license processing and possibly an increased processing cost because of the need for additional personnel.

E. ALTERNATIVES TO GASOLINE RATIONING

1. Introduction

In developing the proposed Gasoline Rationing Plan, FEA evaluated a variety of gasoline demand control techniques to compare their feasibility, cost and overall effectiveness against the proposed rationing system.

This section of the Environmental Assessment describes the alternatives to the proposed plan and qualitatively compares them with the proposed plan with respect to their effects on the physical, economic and social environments. The alternatives discussed below are the reasonable and viable alternatives considered by FEA:

- "No action" -- no new demand restraint mechanism beyond allocation and price controls already in effect during an embargo.
- Rationing as proposed except that ration rights are (eliminating the white market) nontransferable.
- A tax on "excess" gasoline purchases, administered through a national ration card system similar to a credit card system. This alternative is called the PAR system, for Program for Allocation at Retail.
- A general tax on all gasoline sales, rebated to the public.

2. Description of Alternatives

2.1 "No Action" - Allocation and Price Controls With No New Demand Restraint Mechanism

This "No action" alternative is the same as the base-line condition preceding the proposed rationing program. If the

rationing program or another demand restraint mechanism is not implemented, then the baseline environment will continue unchanged.

Although "No action" is included in the exhibit in this section as an alternative for reference, it is not fully described here. A complete description of this alternative is contained in Part C of this report.

2.2 Gasoline Rationing With Nontransferable Ration Rights

This alternative is the same as the proposed rationing plan in all but one important aspect: ration rights may not be legally transferred. All other elements of the proposed rationing plan would be the same, including the production and issuance of coupons, the establishment of ration credit accounts for firms, the redemption of ration rights, and so forth.

Under this alternative, the only sources of additional ration rights for firms and individuals would be the adjustments and appeals mechanisms consisting of the State Hardship Reserve System and adjustments of base period volumes by the FEA regional offices. Ration rights could not be sold or given away.

Legally, ration rights would have no dollar value under this alternative. A black market would be certain to develop for the illegal exchange of ration rights. The illegal market price for ration rights would almost certainly be higher than the "white market" price under the proposed rationing program, since many individuals would not enter the market and the supply of available ration rights would be much smaller.

If this alternative were implemented, the following things would probably occur:

- Individuals and firms with needs lower than their ration allotments would have no incentive to conserve; they would drive as always and would not seek alternative transportation methods.

- Individuals and firms with needs greater than their ration allotments would be forced either to do without the fuel, causing them some cost or hardship, or to apply for relief from the State Hardship Reserve or for an adjusted base period volume (firms only). The burden on these relief mechanisms would be considerably greater under this alternative than under the proposed rationing program, since recourse to the white market would not be available.

- Some firms and individuals would illegally buy and sell ration rights on a black market, adding to the difficulty of audit and enforcement operations.

- The total volume of gasoline sold would be less than the number of ration rights issued, since many people with needs less than their allotments would save or throw away their extra ration rights rather than sell them illegally. For every coupon or ration credit saved or destroyed, a gallon of gasoline would remain unsold and unsellable in suppliers' inventories. it could anger the public to see supplies available and growing while the nation suffered from shortages. FEA could offset this somewhat by adding expiration dates to all coupon series and by adding unsold gasoline from one ration period into the total available supply for the next period.

- The forced storage of gasoline caused by unused coupons (described above) would reduce total driving. Vacation driving would be especially hard hit, as individuals cancel trips they otherwise would have taken if coupons could be legally purchased along the way.

2.3 Program for Allocation at Retail (PAR)

This alternative would levy a penalty tax on all gasoline purchases above a certain "tax-free" level for each person. A credit card system would be used to record the volume of gasoline associated with each sale. This information would be maintained by a central record system in each State. Invoices would be mailed for penalty tax owed on gasoline purchases above a certain predetermined entitlement level each month. Purchasers who bought less than the entitlement amount would owe no tax.

The system would require a large bureaucracy to process paper records of all gasoline sales (30 million per day), and to mail invoices and collect payments for penalty tax due.

Like all tax systems used to restrain demand, this system would provide no absolute ceiling on the amount of purchasable gasoline, but would discourage demand through the price mechanism. Specific levels of demand restraint could be achieved by varying the tax according to experience once the system had been implemented. Excess tax revenues above program costs would be rebated to the public.

2.4 General Tax With Rebate

This alternative would involve no coupons, credit cards, or other documents at the time of a gasoline purchase, but would

levy a new general tax on all gasoline, in addition to the existing Federal and State excise taxes on gasoline. The purpose of this tax would be to reduce demand for gasoline through the price mechanism. The administrative system to collect excise taxes already exists, which would mean that a very small bureaucracy and very short lead time would be required to implement this system. The tax would be set at a level estimated to reduce demand to estimated supply, according to the estimated demand elasticity for gasoline.

Tax revenues collected under this alternative would be returned to all firms and licensed drivers in the form of a rebate, either through periodic checks or through a once-a-year tax credit on income taxes. Hardship cases would receive more frequent rebate checks upon application. The entire program could begin with a "prebate" check mailed to all licensed drivers which would eliminate hardships resulting from payment of the tax.

To accommodate variations in the total gasoline supply and to take into account uncertainties and variability in the demand elasticity for gasoline, the actual amount of the tax would have to be variable from month to month or even week to week.

3. Environmental Impact of Alternatives

This section compares in a brief, summary form, the estimated environmental impacts of each alternative with those of the proposed Plan. In some cases, where the impacts are similar to the proposed Plan, "same as plan" is written.

Exhibit 6 displays the summary impacts of all the alternatives to the proposed gasoline rationing plan.

EXHIBIT 6

COMPARISON OF ENVIRONMENTAL IMPACT OF GASOLINE RATIONING (AS PROPOSED) TO OTHER ALTERNATIVES

	PHYSICAL ENVIRONMENT CONDITIONS				
	Automobile Pollution Emissions	Total Industrial Air & Water Pollution	Consumption of Paper and Other Natural Resources	Generation of Solid Waste	Fuel Handling Hazards
PROPOSED ACTION	Total emissions same as Alternative 1; distribution altered slightly	Slightly increased from Alternative 1	Slightly increased from Alternative 1	Slightly increased from Alternative 1	Decreased from Alternative 1
ALTERNATIVE 1 Baseline (Allocation and Price Controls During an Embargo) "No Action"	Decreased from normal conditions	Decreased from normal conditions	Decreased from normal conditions	Decreased from normal conditions	Increased from normal conditions (scarcity encourages unsafe storage methods)
	Embargo-induced reduction on Gross National Product results in decreases above.				
ALTERNATIVE 2 Gasoline Rationing with Non-Transferable Ration Rights	Slightly reduced from Proposed Action and Alternative 1 due to unused gasoline	Reduced from Proposed Action; approximately the same as Alternative 1 due to elimination of white market	Same as Proposed Action	Same as Proposed Action; increased from Alternative 1	Increased from Proposed Action
ALTERNATIVE 3 Program for Allocation at Retail (PAR) - Tax on "Excess" Purchases	Same as Proposed Action	Same as Proposed Action	Increased from Proposed Action - sales slips and invoices offset savings in coupons	Increased from Proposed Action - greater paper volume plus plastic cards	Same as Proposed Action
ALTERNATIVE 4 Tax/Rebate	Same as Proposed Action	Same as Proposed Action	Less than Proposed Action and Alternatives 3 & 4; slightly greater than Alternative 1	Less than Proposed Action and Alternatives 3 & 4; slightly greater than Alternative 1	Same as Proposed Action

EXHIBIT 6 (continued)

COMPARISON OF ENVIRONMENTAL IMPACT OF GASOLINE RATIONING (AS PROPOSED) TO OTHER ALTERNATIVES

	ECONOMIC CONDITIONS				
	Total U.S. Employment	Tourism and Travel	Income Transfer Among Income Classes	Income Transfer Among States	Cost of Retail Purchasing Activities
PROPOSED ACTION	Slightly increased from Alternative 1	Increased from Alternative 1 -- greater assurance of supply in remote areas	Increased from Alternative 1, but hardship system offsets transfers for poor	Increased from Alternative 1	Lines eliminated but ration rights acquisition and handling costs added. Net improvement over Alternative 1
ALTERNATIVE 1 Baseline (Allocation and Price Controls During an Embargo) "No Action"	Decreased from normal conditions	Decreased sharply from normal conditions	None	None	Significant cost of finding and then waiting in line for gasoline at retail stations
			These elements occur only under rationing.		
ALTERNATIVE 2 Gasoline Rationing with Non-Transferable Ration Rights	Reduced from Proposed Action; possibly below Alternative 1	Reduced from Proposed Action; possibly below Alternative 1	None, except for small amount of black market transfers	None, except for small amount of black market transfers	Same as Proposed Action
ALTERNATIVE 3 Program for Allocation at Retail (PAR) - Tax on "Excess" Purchases	Approximately the same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Approximately the same as Proposed Action
			Tax and rebates have a net effect very similar to white market.		
ALTERNATIVE 4 Tax/Rebate	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Best of all options; no lines, no ration rights handling. Some cost of applying for rebates
			Tax and rebates have a net effect very similar to white market.		

EXHIBIT 6 (continued)

COMPARISON OF ENVIRONMENTAL IMPACT OF GASOLINE RATIONING (AS PROPOSED) TO OTHER ALTERNATIVES

	SOCIAL/QUALITY OF LIFE CONDITIONS			
	Equity of Distribution	Inconvenience Related to Fuel Acquisition Process	Unlawful Acts and Violence	Driver's License Applications
PROPOSED ACTION	Greatly increased from Alternative 1, according to FEA priority classes	Coupon acquisition and handling an inconvenience, but retail lines eliminated; a net improvement	Violence reduced but ration rights fraud increased; net improvement from Alternative 1	Long lines; more inconvenience than Alternative 1
ALTERNATIVE 1 Baseline (Allocation and Price Controls During an Embargo) "No Action"	"First-come-first-served," resulting in very unequal distribution to retail purchasers	Long lines at retail gasoline stations	Increased from normal conditions (fuel theft, violence at stations, etc.)	Generally no significant change from normal conditions
ALTERNATIVE 2 Gasoline Rationing with Non-Transferable Ration Rights	Better than Alternative 1, but not as good as Proposed Action, due to white market elimination	Same as Proposed Action	Improvement over violence of Alternative 1, but worse than Proposed Action due to black market	Same as Proposed Action
ALTERNATIVE 3 Program for Allocation at Retail (PAR) - Tax on "Excess" Purchases	Same as Proposed Action	Same as Proposed Action, with card handling instead of coupon handling	Approximately the same as Proposed Action -- card fraud replaces coupon fraud	Same as Proposed Action
ALTERNATIVE 4 Tax/Rebate	Same as Proposed Action. Rebates distributed in same pattern as ration rights under rationing	Best of all options. No lines, no ration rights handling. Some inconvenience associated with rebate applications.	Some rebate application fraud, but less violence than Alternative 1 and fewer fraud opportunities than Proposed Action and Alternatives 3&4	Same as Proposed Action

3.1 "No Action" - Allocation and Price Controls with No New Demand Restraint Mechanism

This alternative is included in Exhibit 6 for illustrative purposes only. Since "No action" is the same as the baseline there is no impact on the baseline environment. Part C of this report contains a full description of the baseline.

3.2 Gasoline Rationing With Nontransferable Ration Rights

3.2.1 Automobile Pollution Emissions

Under this alternative, less gasoline is consumed in total than under the proposed plan, because individuals with excess or unneeded coupons cannot sell or give them to others who would use them. This reduced total volume of gasoline sales leads to a reduced level of automobile pollutant emissions.

3.2.2 Total Industrial Air and Water Pollution

With firms unable to buy coupons for their excess needs, economic activity under this alternative is below the level of that in the proposed plan; total industrial pollution is correspondingly less.

3.2.3 Consumption of Paper and Other Natural Resources

Same as plan.

3.2.4 Generation of Solid Waste

Same as plan.

3.2.5 Fuel Handling Hazards

From time to time, FEA would need to declare all old coupon series invalid and to add into the available supply for future months all gasoline unused in previous months. This would create a strong incentive to purchase gasoline for storage before coupons expired. Fuel handling hazards would increase correspondingly.

3.2.6 Total U.S. Employment

Nontransferability of ration rights would reduce overall economic activity, and with it, total U.S. employment. With some gasoline unsold, corresponding to unneeded ration rights, it is possible that GNP and total employment would decline to a level lower than that anticipated for the baseline. Under the baseline, all gasoline would be sold on a first-come-first-served basis at retail.

3.2.7 Tourism and Travel

Vacation travel would be seriously reduced under this alternative, since no individual could acquire coupons in excess of the amount that he/she can save from his/her own allotments. Travel of foreigners in the United States would be substantially reduced unless a special allotment system were provided for foreigners.

3.2.8 Income Transfer Between Income Classes

Except for illegal black market transactions, there would be no income transfers under this alternative. No ration rights could be sold legally.

3.2.9 Income Transfer Between States

Except for illegal black market transactions, there would be no income transfers under this alternative. No ration rights could be sold legally.

3.2.10 Cost of Retail Purchasing Activities

Same as plan.

3.2.11 Equity of Distribution

While this alternative would improve upon the baseline, by making specific allotments rather than allowing first-come-first-served sales, the elimination of the white market reduces equity below the level of the proposed plan by thwarting the action of the market in moving gasoline to consumers with the greatest needs in excess of their allotments.

3.2.12 Inconvenience Related to Fuel Acquisition Process

Same as plan.

3.2.13 Unlawful Acts and Violence

The long lines at retail gasoline stations characteristic of the baseline environment would be eliminated by this option, but the development of an illegal black market for ration rights would represent an increase in unlawful acts above the level anticipated with the proposed plan.

3.2.14 Driver's License Applications

Same as plan.

3.3 Program for Allocation at Retail (PAR)

3.3.1 Automobile Pollution Emissions

Same as plan.

3.3.2 Total Industrial Pollution

Same as plan.

3.3.3 Consumption of Paper and Other Natural Resources

Although there would be no coupons for this alternative, the imprinted sales slips required for all retail gasoline sales and the invoices for all excess purchases would represent a volume of paper equal to that of the proposed coupon rationing plan.

3.3.4 Generation of Solid Waste

All of the paper described for this alternative in 3.3.3 above would represent a greater volume of solid waste than under the proposed plan. The plastic cards used with this alternative represent an additional amount of solid waste above the paper volumes.

3.3.5 Fuel Handling Hazards

Same as plan.

3.3.6 Total U.S. Employment

Same as plan.

3.3.7 Tourism and Travel

Same as plan.

3.3.8 Income Transfer Between Income Classes

Assuming a general rebate of excess tax revenues over program costs, this alternative would result in the same income transfers as the proposed rationing plan.

3.3.9 Income Transfer Between States

Assuming a general rebate of excess tax revenues over program costs, this alternative would result in the same income transfers as the proposed rationing plan.

3.3.10 Cost of Retail Purchasing Activities

The use of a plastic card instead of coupons at each retail sale represents approximately the same burden to the retail purchaser as under the proposed plan.

3.3.11 Equity of Distribution

Same as plan.

3.3.12 Inconvenience Related to Fuel Acquisition Process

The use of a plastic card instead of coupons at each retail sale represents approximately the same burden to the retail purchaser as under the proposed plan.

3.3.13 Unlawful Acts and Violence

Fraud under this alternative would include counterfeiting the imprinted cards, falsifying sales slips and using outdated or invalid cards. Each of these types of fraud has a parallel in the proposed rationing plan. The net level of unlawful acts is estimated to be approximately the same under this alternative as under the proposed plan.

3.3.14 Driver's License Applications

Same as plan.

3.4 General Tax With Rebate

3.4.1 Automobile Pollution Emissions

Same as plan.

3.4.2 Total Industrial Pollution

Same as plan.

3.4.3 Consumption of Paper and Other Natural Resources

Using neither coupons nor plastic cards, this alternative consumes significantly less paper than all other rationing alternatives. The rebate-related paperwork and the rebate checks associated with this alternative represent a relatively small increase in paper consumption to the baseline.

3.4.4 Generation of Solid Waste

This alternative produces slightly more waste than the baseline, but less than other rationing alternatives for reasons described in 3.4.3 above.

3.4.5 Fuel Handling Hazards

Same as plan.

3.4.6 Total U.S. Employment

Same as plan.

3.4.7 Tourism and Travel

Same as plan.

3.4.8 Income Transfer Among Income Classes

Assuming a general rebate of excess tax revenues over program costs, this alternative would result in the same income transfers as the proposed rationing plan.

3.4.9 Income Transfer Between States

Assuming a general rebate of excess tax revenues over program costs, this alternative would result in the same income transfers as the proposed rationing plan.

3.4.10 Cost of Retail Purchasing Activities

This alternative represents the lowest economic cost of purchasing gasoline compared to all alternatives and to the baseline. Lines and waiting are eliminated, and no coupons or cards need to be handled. Rebate applications will take some time and effort, but this is small compared to waiting in line or applying for and handling ration rights.

3.4.11 Equity of Distribution

Same as the proposed rationing plan if it is assumed that rebates are distributed in the same pattern as ration rights under the proposed plan.

3.4.12 Inconvenience Related to Fuel Acquisition Process

This alternative affords the least inconvenience of all alternatives and far less than the baseline as well. Except for rebate applications and minor cash flow interruptions, the average gasoline consumer faces no other obstacles and procedures in the purchase of gasoline.

3.4.13 Unlawful Acts and Violence

With no retail gasoline lines, violence is eliminated under this alternative and with no coupons or cards to be counterfeited, fraud is also reduced. However, multiple rebate applications remain as a possibility for fraud.

3.4.14 Driver's License Applications

Same as plan.

F. SUMMARY OF REASONABLE DIESEL FUEL RATIONING ALTERNATIVES

1. Introduction

Several alternatives to the proposed diesel fuel rationing plan were considered. Some of these alternatives were judged not to be reasonable due to their ineffectiveness in achieving the program goals. These ineffective alternatives are not treated in detail in this Environmental Assessment, but are listed below for information:

- Ration Card Alternative where entitlements are issued according to the proposed diesel fuel rationing system, to all consumers in the form of cards with printed gallonage values which would be marked off according to the amount of diesel fuel purchased. The system, which is basically an honor system, provides no incentive for the retailer to mark the card, leaves no audit trail, and presents problems with the control and resupply of ration cards.

- End-User/Retailer Logbook Alternative where retailers and/or firms would keep logbooks concerning purchase activity which would be submitted periodically to an FEA office where amounts purchased would be reconciled to entitlement volumes. Under this alternative, the consumer has the incentive not to record all transactions. Further problems involve auditing records, multiplicity of paper, and determining and assigning entitlements.

- Entitlement Decal Alternative where decals on diesel vehicles would limit the purchases of fuel to particular days. The system does not provide for entitlement procedures as specified by EPCA and the limitations would apply to only a small segment of the driving public.

The two reasonable alternatives to the proposed diesel credit card rationing system are:

- "No action"
- Ration checking account system

A summary of each of these alternatives is briefly described below.

2. Description of Alternatives

2.1 "No Action" Alternative

The "no action" alternative assumes no Federal action to limit the amount of diesel fuel allocated to any consumer, with the exception of the utilization of the Mandatory Allocation Program. It is possible that this alternative might be an adequate control, if the extent and duration of the oil embargo is not great. However, the "no action" alternative is not likely to be effective under severe shortage conditions. Impacts associated with this alternative are identical to the "baseline" conditions described in Part C.

2.2 Ration Checking Account Alternative

This alternative is identical to the proposed diesel rationing system for purchase of diesel fuel at retail by owners of diesel automobiles, in that they would use their gasoline rationing coupons issued under the proposed gasoline rationing plan. Purchases of diesel fuel at retail by firms, however, differs from the proposed plan in that consumers would be required to use diesel credit checks in lieu of the credit card under the proposed plan.

Diesel fuel retailers would be required to open diesel ration bank accounts, and utilize the same accounting procedures as described under the proposed gasoline program. Firms would open diesel ration credit accounts based on historical purchases of diesel at retail in a similar fashion. These firms would acquire diesel fuel at retail in exchange for a ration credit check and the appropriate monetary payment.

This plan differs, therefore, in only one aspect from the proposed diesel plan, and that is the requirement for more extensive ration banking stationery at the retail and firm level, and substitution of the ration credit check for the credit card.

3. Environmental Impact of Alternatives

The environmental impact of the various alternatives are detailed in Exhibit 7.

3.1 "No Action" Alternative

The environmental impact of this alternative is the same as that described in Part C of this report, and is therefore not described in this section.

3.2 Ration Checking Account Alternative

This alternative is almost identical to the proposed diesel fuel rationing plan except that a ration credit check is substituted for the "credit card." The environmental impacts of this plan are almost identical to the proposed plan except in a few areas.

Consumption of paper and other natural resources is about the same in total, because of the substitution of checking account materials for charge slips and credit cards. The type

EXHIBIT 7

COMPARISON OF ENVIRONMENTAL IMPACT OF DIESEL FUEL RATIONING (AS PROPOSED) TO OTHER ALTERNATIVES

PHYSICAL ENVIRONMENT CONDITIONS

	Automobile Pollution Emissions	Total Industrial Air & Water Pollution	Consumption of Paper and Other Natural Resources	Generation of Solid Waste	Fuel Handling Hazards
PROPOSED ACTION	Total emissions same as Alternative 1; distribution altered slightly	Slightly increased from Alternative 1	Slightly increased from Alternative 1	Slightly increased from Alternative 1	Decreased from Alternative 1
ALTERNATIVE 1 Baseline (Allocation and Price Controls During an Embargo) "No Action"	Decreased from normal conditions	Decreased from normal conditions	Decreased from normal conditions	Decreased from normal conditions	Increased from normal conditions (scarcity encourages unsafe storage methods)
	Embargo-induced reduction on Gross National Product results in decreases above.				
ALTERNATIVE 2 Checking Account	Same as Proposed Action	Same as Proposed Action	About the same (total) but more paper for ration banking materials versus cards and paper under Proposed Action	Volume of waste about the same as Proposed Action, but makeup differs	Same as Proposed Action

EXHIBIT 7 (continued)

COMPARISON OF ENVIRONMENTAL IMPACT OF DIESEL FUEL RATIONING (AS PROPOSED) TO OTHER ALTERNATIVES

	ECONOMIC CONDITIONS				
	Total U.S. Employment	Tourism and Travel	Income Transfer Among Income Classes	Income Transfer Among States	Cost of Retail Purchasing Activities
PROPOSED ACTION	Slightly increased from Alternative 1	Increased from Alternative 1 -- greater assurance of supply in remote areas	Increased from Alternative 1, but hardship system offsets transfers for poor	Increased from Alternative 1	Lines eliminated but ration rights acquisition and handling costs added. Net improvement over Alternative 1
ALTERNATIVE 1 Baseline (Allocation and Price Controls During an Embargo) "No Action"	Decreased from normal conditions	Decreased sharply from normal conditions	None	None	Significant cost of finding and then waiting in line for gasoline at retail stations
			These elements occur only under rationing.		
ALTERNATIVE 2 Checking Account	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

EXHIBIT 7 (continued)

COMPARISON OF ENVIRONMENTAL IMPACT OF DIESEL FUEL RATIONING (AS PROPOSED) TO OTHER ALTERNATIVES

SOCIAL/QUALITY OF LIFE CONDITIONS

	Equity of Distribution	Inconvenience Related to Fuel Acquisition Process	Unlawful Acts and Violence	Driver's License Applications
PROPOSED ACTION	Greatly increased from Alternative 1, according to FEA priority classes	Coupon acquisition and handling an inconvenience, but retail lines eliminated; a net improvement	Violence eliminated but ration rights fraud increased; net improvement from Alternative 1	Long lines; more inconvenience than Alternative 1
ALTERNATIVE 1 Baseline (Allocation and Price Controls During an Embargo) "No Action"	"First-come-first-served," resulting in very unequal distribution to retail purchasers	Long lines at retail gasoline stations	Increased from normal conditions (fuel theft, violence at stations, etc.)	Generally no significant change from normal conditions
ALTERNATIVE 2 Checking Account	Same as Proposed Action	Same as Proposed Action	Number of crimes about the same as Proposed Action, but types vary; more dealing with fraudulent checks	Same as Proposed Action

of resources consumed, however, varies from plastic to paper products. This alteration in consumption patterns is also felt in the generation of solid waste, where the type of waste is different -- all paper versus cards and paper under the proposed plan.

The total amount of unlawful acts and violence is not likely to change, although the variety of crimes -- dealing more with check fraud versus coupon and credit card fraud -- will vary.

The remaining types of impacts are the same or very similar to the proposed plan under the checking account system.

G. CONSIDERATIONS OFFSETTING THE ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

The adverse or negative environmental impacts associated with the proposed gasoline and diesel fuel rationing program -- such as slightly increased paper/natural resource consumption, solid waste production and industrial air and water pollution, are considered to be insignificant when compared with the baseline condition. The proposed rationing program, however, presents a number of significant benefits, all related to the premise that the program results in an equitable distribution of available gasoline and diesel fuel supplies.

Specifically, rationing enables the economy to remain relatively stable in the midst of a highly precarious situation (the embargo) by assuring that all firms receive no less than 90 percent of their base period volumes of gasoline. Essential activities in higher priority classes will receive even greater allotments. This element, along with the standard allotment of coupons received by individuals, enables both businesses and individuals to plan ahead, knowing that they will be able to acquire a specified volume of gasoline each ration period. This certainty of supply has ramifications that are felt throughout the economy, in such sectors as industrial production and tourism.

The benefits associated with the rationing program as proposed are believed by FEA to more than offset the relatively insignificant adverse environmental effects created by the program.

APPENDIX B

EXHIBITS

EXHIBIT B-1

CANADIAN VISITOR TRAVEL IN THE UNITED STATES

State of Entry	1/ Number of Arrivals	Percentage Distribution of Canadian Travelers 2/	Possible Destination 3/	Distribution of Canadian Travelers	Number of Automobiles	Total Gallons of Gasoline Consumed	Totals
Illinois	183,451	37.4%	Great Lakes Country	41,192	16,745	1,533,893	
			The South	46,341	18,838	2,083,750	3,859,495
			Frontier West	9,628	3,914	231,852	
New York	143,300	29.2%	George Washington Country	34,326	13,954	2,130,382	
			Eastern Gateway	78,640	31,894	2,434,656	6,193,424
			The South	36,042	14,651	1,628,386	
Michigan	72,456	14.8%	Great Lakes Country	15,888	6,459	591,664	1,429,142
			The South	18,536	7,535	837,478	
Washington	37,155	7.6%	Old West	25,304	10,286	1,727,420	7,498,045
			Far West	81,206	33,011	5,770,625	
Maine	30,435	6.2%	New England	62,670	25,476	1,260,187	1,260,187
Vermont	12,404	2.5%	New England	25,598	10,406	514,740	514,740
Ohio	5,414	1.1%	Great Lakes Country	1,177	478	43,786	136,814
			The South	2,060	837	93,028	
Montana	3,424	.7%	Old West	2,354	957	160,718	
			Far West	7,062	2,871	501,877	666,919
			Frontier West	180	73	4,324	
Minnesota	2,338	.5%	Great Lakes	588	239	21,893	242,305
			Old West	1,765	717	120,512	
TOTALS	490,377	100.0%		490,377	199,340	21,801,071	20,801,071

1/ U.S. Department of Justice, Immigration and Naturalization Service, Report of the Commissioner of Immigration and Naturalization, 1973 Annual Report.

2/ Ibid.

3/ U.S. Department of Commerce, U.S. Travel Service, Summary and Analysis of International Travel to the U.S.; Vacation Travel by Canadians in 1973, September 1974.

EXHIBIT B-2

MEXICAN VISITOR TRAVEL IN THE UNITED STATES

State of Entry	1/ Percentage Distribution of Mexican Travelers	Possible Destination 2/	3/ Percent Distribution of Travel	Average Round Trip Distance in Miles	7/ Number of Visitors Traveling	8/ Number of Automobiles	Total Gallons of Gasoline Consumed	Totals
California	32%	Los Angeles	18.0%	300	226,469	92,061	2,018,267	
		San Francisco	7.0%	1,200	88,071	35,801	3,279,481	6,916,652
		Other U.S. Cities	9.9%	418 5/	124,810	50,736	1,618,904	
Texas	41%	Houston	6.0%	500	75,490	30,687	1,171,260	
		San Antonio	13.0%	240	163,561	66,488	1,218,101	
		Other Texas Cities	10.0%	280 6/	125,816	51,145	1,093,176	18,389,844
		New York	2.0%	3,748	25,163	10,229	2,926,587	
		Chicago	4.0%	6,246	50,328	20,459	9,754,726	
		Other U.S. Cities	12.8%	418	159,913	69,762	2,225,994	
Arizona	25%	Las Vegas	2.0%	660	25,163	10,229	515,354	1,678,958
		Other U.S. Cities	7.7%	418	97,508	36,467	1,163,604	
New Mexico	2%	Other U.S. Cities	.6%	418	7,800	1,585	50,575	50,575
TOTALS	100%		93.0% 4/		1,170,092	457,649	27,036,029	27,036,029

1/ U.S. Department of Justice, Immigration and Naturalization Service, Report of the Commissioner of Immigration and Naturalization, 1973 Annual Report.

2/ U.S. Department of Commerce, U.S. Travel Service, Office of Research and Analysis, A Study of Mexican Travel Habits and Patterns, March 1971.

3/ Ibid.

4/ San Diego (22) and Laredo (2%) not included.

5/ Average of specific destinations (by percent of specified destinations).

6/ Corpus Cristi used as a typical distance.

7/ U.S. Department of Commerce, U.S. Travel Service, Summary and Analysis of International Travel to the U.S., September 1974.

8/ Assuming 2.46 passengers per automobile - U.S. Department of Commerce, U.S. Travel Service, A Study of Mexican Travel Habits and Patterns, March 1971.

EXHIBIT B-3

WRITTEN ANALYSIS OF GASOLINE CONSUMPTION PER LICENSED DRIVER[1/]

The Battelle Personal Consumption Model yielded information on family expenditure patterns and number of families by income class for 1975. The number of families in each income class was used, along with recent U.S. Census data, to derive approximations of the gasoline consumption per driver by income class.

Inputs to the calculations included:

- The total number of families and individuals in each income class as shown in Exhibit B-4 based on the data from Battelle-Columbus' Personal Consumption Expenditure Model.

- Data from the 1970 Nationwide Personal Transportation Study on the number of drivers/household by income class as shown in Exhibit B-5.

- 1973 U.S. Census data on the number of families and individuals/income class as shown in Exhibit B-6.

To arrive at a crude approximation of gasoline consumption per licensed driver by income group, it was necessary to correlate the Battelle estimates of gasoline consumption by income group with the U.S. Department of Transportation (DOT) estimates of licensed drivers/household by income groups. Because the two

---

1/ Reference copies of "Gasoline and Diesel Fuel Rationing Contingency Plan Economic Impact Analysis" (FEA, 1976) are available at FEA, Room 2107, 12th and Pennsylvania Avenue, N.W., Washington, D.C.

sets of data use different income classes, the first step involved correlating the DOT income classes (Exhibit B-5) to the Battelle income classes (Exhibit B-4). This was accomplished by comparing the total number of families and individuals in the Battelle income classes (Exhibit B-4) with the total number of families and individuals in the U.S. Bureau of the Census, Consumer Income Series (Exhibit B-6) and identifying the Census income ranges to which the Battelle ranges correspond. These correlations are shown in Exhibit B-7.

The next step involved calculation of the number of licensed drivers in each Battelle income category using the information in Exhibit B-5 (percent of licensed drivers by household and annual income) and the population in Census income groups corresponding approximately to the Battelle income groups (Exhibit B-7). To do this, the total number of families and individuals from each income class from Exhibit B-7 were weighted by the licensed driver percentage by income group in Exhibit B-5. For example, among families and individuals in the lowest income group (those earning less than $4,000 under the Census income categories), 70 percent earn less than $3,000. Therefore, 0.7 was used to normalize the percent of families with one driver, two drivers, etc. A similar weighting was made for the next grouping which included $4,000 to $4,999 and $5,000 to $5,999. For the other income categories in Exhibit B-7 correspondence with the categories in Exhibit B-5 is not exact and for income over $15,000 no separate categories were available. The percentages in the closest income category were used in these cases. Using this method, the estimated number of licensed drivers for each income category were approximated.[1/] These were then normalized to the total number of licensed drivers for 1974 as is shown in Exhibit B-8.

1/ These approximations are most accurate for the two lowest Battelle income groups where the three data sets (Exhibits B-4, 5, and 6) were in close correspondence. The other six estimates are less reliable due to the lack of close correspondence in the data sets.

EXHIBIT B-4

NUMBER OF FAMILIES AND UNRELATED INDIVIDUALS BY INCOME CLASS, 1975, UNITED STATES (THOUSANDS)

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8
Average Income by Class	(6,240)	(8,000)	(9,400)	(10,600)	(12,400)	(14,700)	(18,700)	(29,300)
TOTAL	14,290	8,029	9,272	9,318	11,511	10,075	4,874	1,276

Source: Battelle-Columbus Laboratories Personal Consumption Expenditures Model.

EXHIBIT B-5

PERCENT OF HOUSEHOLDS BY LICENSED DRIVERS AND ANNUAL INCOME

Number of licensed driver(s) per household	Income classes									
	Under $3,000	$3,000-3,999	$4,000-4,999	$5,000-5,999	$6,000-6,499	$7,500-9,999	$10,000-14,999	$15,000 & over	Income Unknown	All households
	Percent by income class									
One	34.5	42.6	48.4	41.2	34.7	26.0	16.4	11.3	19.2	29.4
Two	10.4	26.8	33.0	40.4	48.2	57.1	64.2	51.9	59.0	42.8
Three	1.4	3.4	3.9	5.4	7.3	11.5	14.3	25.9	21.8	9.4
Four-or-more	0.1	1.1	2/	2.3	2.7	3.1	3.7	10.9	0.0	3.0
Subtotal	46.4	73.9	85.3	89.3	92.9	97.7	98.6	100.0	100.0	84.6
None	53.6	26.1	14.7	10.7	7.1	2.3	1.4	2/	0.0	15.4
All households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0 1/
	Percent by number of licensed drivers									
One	20.0	10.8	10.1	11.6	13.6	13.6	10.1	3.0	7.2	100.0
Two	4.2	4.7	4.7	7.8	13.0	20.6	27.1	9.4	8.5	100.0
Three	2.6	2.7	2.5	4.8	9.0	18.9	27.5	21.4	10.6	100.0
Four-or-more	0.6	2.7	2/	6.3	10.2	15.8	22.4	27.8	14.2	100.0
Subtotal	9.4	6.5	6.2	8.8	12.7	17.8	21.1	9.1	8.4	100.0
None	59.6	12.3	5.7	5.9	5.3	2.3	1.6	0.3	7.0	100.0
All households	17.1	7.5	6.1	8.3	11.5	15.4	18.1	7.8	8.2	100.0 1/

1/ 62.5 million households.

2/ Data insufficient for analysis.

Source: U.S. DOT/FHWA, Nationwide Personal Transportation Survey, Report 11 - Automobile Ownership, 1974, p. 22.

EXHIBIT B-7 (continued)

Battelle Classes			Census Classes	
Class	Average Income	Families and Unrelated Individuals (thousands)	Income Range	Families and Unrelated Individuals (thousands)
6)	$14,700	10,075	$16,000 - $19,999	7,651
			$20,000 - $24,999	4,962
				12,613
7)	$18,700	4,874	$25,000 - $49,000	4,697
8)	$29,300	1,276	$50,000 and over	606

EXHIBIT B-8

ESTIMATED LICENSED DRIVERS BY INCOME CLASS

Income Class		Number of Drivers (1974 in thousands)	% of Total
Increasing income ↓	1	14,441.4	11.3
	2	11,272.0	9.3
	3	16,741.8	13.1
	4	18,786.6	14.7
	5	25,943.4	20.3
	6	24,665.4	19.3
	7	12,141.0	9.5
	8	3,322.8	2.6
		127,800.0	

Using Battelle estimates of gasoline consumption per income group shown in Exhibit B-9 and the estimated number of licensed drivers per income group, gasoline consumption per licensed driver by income group was calculated as shown in Exhibit B-10.

EXHIBIT B-9

GASOLINE CONSUMPTION BY INCOME CLASS [1/]

Income Class		Gasoline Consumed (Gallons) 1974 10^3
Increasing income ↓	1	10,531,485
	2	7,567,067
	3	9,907,397
	4	11,238,584
	5	15,290,156
	6	14,276,013
	7	7,411,045
	8	1,638,231

1/ The Battelle data on household gasoline expenditures by income class was used to calculate the number of gallons consumed by each income class $(\frac{\text{expenditure}}{\text{price/gallon}})$. The relative percents of total consumption were then calculated for each income group. These percents were then applied to the total gallons consumed by private consumers in 1974 ($78,011 \times 10^6$ gal).

EXHIBIT B-10

GASOLINE CONSUMPTION PER LICENSED DRIVER

Income Class		Average Gasoline Consumption/ Licensed Driver/Year (Gallons)
Increasing income ↓	1	729
	2	636
	3	592
	4	598
	5	589
	6	579
	7	610
	8	493

Because the estimates in Exhibit B-10 were calculated using different sets of data, they should be interpreted only as indicative of the gasoline consumption patterns per licensed driver among income groups. They are obviously subject to wide error margins. On the other hand, these tentative estimates of high gasoline consumption per licensed driver among the lower income groups are supported by a recent University of Michigan, Institute for Social Research paper.[1/] The authors, for example, state that:

> "Upon examining the proportion of families allocating more than ten percent of their income to gasoline in each income class, the disproportionate burden on some of the poor is striking -- 15 percent of all families in the lowest quintile spend more than ten percent of their income on gasoline while only two percent of those in the highest income quintile do so. Perhaps even more astonishing is the result that nearly ten percent of all families in the lowest income decile allocate more than 20 percent of their

---

1/ John Holmes, "The Relative Burden of Higher Gasoline Prices," in Five Thousand American Families: Patterns of Economic Progress, Vol. IV, edited by Greg J. Duncan and James N. Morgan, Ann Arbor, Michigan, Institute for Social Research, 1976.

EXHIBIT B-10 (continued)

> income to gasoline expenditures! Since 60 percent of the families in the lowest income decile do not own cars, this implies that 25 percent of all car owners in the lowest income decile spend more than 20 percent of their total income on gasoline charges!"

Again, the summary to the paper highlights the position of the low income individual.

> "Although for all families gasoline expenditures as a proportion of income ranged from an average of five percent in the lower income deciles to slightly under three percent at the higher income deciles, there are subgroups in the lower income deciles with extraordinarily high percentages of their income being allocated to gasoline outlays. For the seven million car-owning families in the lowest third of the income distribution whose head is less than age 55, this amounts to slightly more than 10 percent of their total family money income. Since more than 75 percent of all families in this subgroup who drive to work reported no viable public transportation alternative, this suggests that their flexibility in reducing their driving may also be severely constrained. Thus, unless it is possible for these families to car-pool, find alternative employment, or move closer to work, it appears that any measure which attempts to discourage gasoline consumption through increased prices will result in a disproportionate burden for some families...."

From the statistics developed in this section and from the above findings, it is apparent that the need to purchase gasoline coupons could result in income transfers away from lower income groups. This effect will be partially or fully offset to the extent that the State Hardship Reserves are allocated to lower income individuals.

EXHIBIT B-11

POTENTIAL INCOME TRANSFERS AMONG STATES BASED ON VARIOUS PRICE ELASTICITIES ON PER GALLON COUPON PRICES

State	Annual Gasoline Consumption per Licensed Driver* (1973)	Number of Licensed Drivers (000)	Case I: Elasticity = -.21, price/gallon for coupons = $0.73			Case II: Elasticity = -.12, price/gallon for coupons = $1.05			Case III: Elasticity = -.12, price/gallon for coupons = $0.85			Case IV: Elasticity = -.12, price/gallon for coupons = $0.90		
			X	Y	Additional Income	X	Y	Additional Income	X	Y	Additional Income	X	Y	Additional Income
Alabama	698	1,851	178.7	519	-52,698	147	551	-137,992	119	579	-155,762	126	572	-153,263
Alaska	478	161	122.4	356	14,574	100	378	17,213	81	397	11,358	86	392	12,751
Arizona	628	1,222	160.8	467	11,597	132	496	-20,529	107	521	-42,587	113	515	-38,493
Arkansas	642	1,203	164.4	478	1,756	135	507	-34,105	109	533	-54,195	116	526	-49,004
California	566	12,775	144.9	421	550,219	119	447	442,654	96	470	103,588	102	464	183,960
Colorado	545	1,611	139.5	405	88,202	114	431	82,886	93	452	39,341	98	447	47,847
Connecticut	516	1,808	132.1	384	126,705	108	408	136,685	88	428	79,914	93	423	92,750
Delaware	557	371	142.6	414	17,875	117	440	15,582	95	462	3,676	100	457	7,680
Dist. of Columbia	422	335	108.0	314	40,595	89	333	51,707	72	350	37,017	76	346	40,401
Florida	604	4,759	154.6	443	107,696	127	477	14,991	103	501	-81,948	109	495	-64,247
Georgia	586	3,339	150.0	436	107,249	123	463	59,601	100	486	-17,029	105	481	-3,005
Hawaii	415	475	106.2	309	59,294	87	328	75,810	71	344	51,910	75	340	59,050
Idaho	547	539	140.0	407	28,723	115	432	27,166	93	454	11,912	98	445	16,979
Illinois	557	6,124	142.6	414	295,054	117	440	257,208	95	462	93,697	100	457	126,766
Indiana	638	2,959	163.3	475	10,800	134	504	-74,566	108	530	-125,758	115	523	-114,513
Iowa	607	1,781	155.4	452	36,404	127	480	0	103	504	-36,332	109	498	-28,852
Kansas	445	1,594	113.9	331	173,379	93	352	214,234	76	369	150,394	80	365	164,979
Kentucky	651	1,722	166.7	484	-5,028	137	514	-61,475	111	540	-87,822	117	534	-83,689
Louisiana	559	2,016	143.1	416	94,188	117	442	80,438	95	464	27,418	101	458	39,917
Maine	609	595	155.9	453	11,727	128	481	-625	104	505	-12,643	110	499	-10,175
Maryland	579	2,218	148.2	431	79,338	122	457	53,565	98	481	-1,885	104	475	9,981
Massachusetts	517	3,209	132.4	385	222,544	109	408	242,600	88	429	139,110	93	424	161,734
Michigan	588	5,436	150.5	437	170,636	123	465	85,617	100	488	-35,964	106	482	-9,705
Minnesota	578	2,384	148.0	430	87,016	121	457	57,574	98	476	8,106	104	474	12,874
Mississippi	594	1,379	152.1	442	38,253	125	469	15,927	101	493	-15,238	107	487	-8,698
Missouri	602	2,875	154.1	448	67,160	126	476	12,075	102	500	-48,875	108	494	-36,225
Montana	632	462	161.8	470	3,373	133	499	-9,217	107	525	-17,672	114	518	-15,800
Nebraska	554	1,037	141.8	412	51,477	116	438	45,732	94	460	17,629	100	454	24,266
Nevada	470	389	120.3	350	36,916	99	371	44,521	80	390	29,759	85	385	33,260
New Hampshire	511	505	130.8	380	36,865	107	404	40,299	87	424	24,038	92	419	27,725
New Jersey	520	4,342	133.1	387	294,778	109	411	314,578	88	432	177,154	94	426	211,021
New Mexico	644	666	164.9	479	486	135	509	-20,280	109	535	-31,136	116	528	-28,771
New York	596	8,546	152.6	443	230,827	125	471	80,760	101	495	-108,962	107	489	-69,223
North Carolina	621	3,060	159.0	462	49,208	130	491	-35,343	106	515	-91,035	112	509	-79,866
North Dakota	625	354	160.0	465	3,876	131	494	-5,203	106	519	-11,735	113	512	-10,195
Ohio	554	6,294	141.8	412	312,434	116	438	277,565	94	460	106,998	100	454	147,280
Oklahoma	635	1,674	162.6	472	9,776	133	502	-38,669	108	527	-66,876	114	521	-61,771
Oregon	541	1,497	138.5	402	85,239	114	427	83,308	92	449	39,446	97	444	48,502
Pennsylvania	507	6,574	129.8	377	494,299	106	401	545,313	86	421	329,686	91	416	378,662
Rhode Island	453	558	116	337	58,250	95	358	71,479	77	376	49,327	82	371	54,740
South Carolina	731	1,416	187	544	-66,156	154	577	-144,220	124	607	-152,857	132	599	-151,654
South Dakota	598	417	153	445	10,654	126	472	3,503	102	496	-5,671	108	490	-3,753
Tennessee	616	2,254	158	458	36,199	129	487	-16,567	105	511	-59,392	111	505	-50,715
Texas	726	6,973	186	540	-305,417	152	574	-688,235	123	603	-729,027	131	595	-721,706
Utah	630	665	161	469	5,339	132	498	-12,569	107	523	-24,306	113	517	-22,145
Vermont	479	293	123	356	26,522	101	378	31,380	81	398	20,422	86	393	22,942
Virginia	589	2,856	151	438	87,565	124	465	44,982	100	489	-21,848	106	483	-7,711
Washington	553	2,145	142	411	108,043	116	437	96,847	94	459	33,288	100	453	52,124
West Virginia	510	1,051	131	379	77,490	107	403	84,973	87	423	50,921	92	418	58,646
Wisconsin	554	2,594	142	412	128,766	116	438	114,395	94	460	44,098	100	454	60,700
Wyoming	749	224	192	557	-12,591	157	592	-18,314	127	622	-27,036	135	614	-27,014
Total Desired Value of Sales					4,580,366			3,823,198			1,694,207			2,098,337
Total Desired Value of Purchases					-441,890			-1,313,909			-2,066,591			-1,851,063
Difference representing surplus or deficit of coupons					4,138,476			2,509,289			-372,384			247,274

Source: U.S. Department of Transportation, Federal Highway Administration, "1973 Highway Statistics," Washington D.C., 1973.

EXHIBIT B-12

LICENSED AND ELIGIBLE UNLICENSED DRIVERS IN THE U.S. 1/

State	Persons of Driving Age 2/	Licensed Drivers	Eligible Unlicensed Drivers
Alabama	2,561,000	1,851,000	710,000
Alaska	221,000	161,000	60,000
Arizona	1,474,000	1,222,000	252,000
Arkansas	1,496,000	1,203,000	293,000
California	15,320,000	12,775,000	2,545,000
Colorado	1,613,000	1,611,000	2,000
Connecticut	2,281,000	1,808,000	473,000
Delaware	417,000	371,000	46,000
Dist. of Col.	566,000	335,000	231,000
Florida	5,849,000	4,759,000	1,090,000
Georgia	3,428,000	3,339,000	89,000
Hawaii	598,000	475,000	123,000
Idaho	550,000	539,000	11,000
Illinois	8,232,000	6,124,000	2,108,000
Indiana	3,852,000	2,959,000	893,000
Iowa	2,135,000	1,781,000	354,000
Kansas	1,704,000	1,594,000	110,000
Kentucky	2,438,000	1,722,000	716,000
Louisiana	2,645,000	2,016,000	629,000
Maine	750,000	595,000	155,000
Maryland	2,965,000	2,218,000	747,000
Massachusetts	4,339,000	3,209,000	1,130,000
Michigan	6,498,000	5,436,000	1,062,000
Minnesota	2,818,000	2,384,000	434,000
Mississippi	1,604,000	1,379,000	225,000
Missouri	3,530,000	2,875,000	655,000
Montana	522,000	462,000	60,000
Nebraska	1,135,000	1,087,000	48,000
Nevada	397,000	389,000	8,000
New Hampshire	576,000	505,000	71,000
New Jersey	5,455,000	4,342,000	1,113,000
New Mexico	767,000	666,000	101,000
New York	13,673,000	8,546,000	5,127,000
North Carolina	3,856,000	3,060,000	796,000
North Dakota	464,000	354,000	110,000
Ohio	7,833,000	6,294,000	1,539,000
Oklahoma	1,987,000	1,674,000	313,000
Oregon	1,663,000	1,497,000	166,000
Pennsylvania	8,963,000	6,574,000	2,362,000
Rhode Island	731,000	558,000	173,000
South Carolina	1,949,000	1,416,000	533,000
South Dakota	498,000	417,000	81,000
Tennessee	3,042,000	2,245,000	797,000
Texas	8,498,000	6,973,000	1,525,000
Utah	791,000	665,000	126,000
Vermont	335,000	293,000	42,000
Virginia	3,532,000	2,856,000	676,000
Washington	2,534,000	2,145,000	389,000
West Virginia	1,335,000	1,051,000	284,000
Wisconsin	3,317,000	2,594,000	723,000
Wyoming	256,000	224,000.	32,000
Total	153,966,000	121,628,000	32,338,000

1/ Source: U.S. Department of Transportation, Federal Highway Administration, "1973 Highway Statistics," Washington, D.C., 1973.

2/ Estimates as of July 1, 1973, supplied by the Bureau of the Census.

APPENDIX C

REFERENCES

APPENDIX C: REFERENCES

Automotive News, June 28, 1976, Detroit, Michigan.

American Paper Institute, New York, N.Y.

Battelle-Columbus Laboratories.

Denskin, M., S. Shladover, and K. Sobel. "Service Station Queuing During the Gasoline Shortage." Technical Report #97 (Operations Research Center, Massachusetts Institute of Technology, Cambridge, Massachusetts), July 1974.

Federal Energy Administration, "Gasoline and Diesel Fuel Rationing Contingency Plan, Economic Impact Analysis," Washington, D.C., 1976.

Hemphill, J. "Gasoline Consumption." Conservation and Environment, March 1975.

Hirst, E. "Transportation Energy Conservation Policies." Science, Vol. 192, No. 4234, April 2, 1976.

Holmes, J. "The Relative Burden of Higher Gasoline Prices." Five Thousand American Families: Patterns of Economic Progress, Vol. IV, edited by Greg J. Duncan and James N. Morgan, Ann Arbor, Michigan, Institute for Social Research, 1976.

Mercedes-Benz, Market Research Division, Montvale, New Jersey.

Musial, J.J. and J.L. Stearns. "Gasoline Rationing as a Solution to Resource, Environmental, and Urban Problems." International Journal of Environmental Studies, Vol. 5, No. 3, 1973. pp. 173-181.

National Forest Products Association, Washington, D.C.

National Petroleum News, Vol. 67, No. 5A, Factbook Issue, Mid-May 1975.

Peugeot Market Research Department, Clifton, New Jersey.

U.S. Bureau of the Census, Consumer Income Series, No. 97, 1975.

U.S. Department of Commerce, U.S. Travel Service, Office of Research and Analysis. A Study of Mexican Travel Habits and Patterns, March 1971.

———————. Summary and Analysis of International Travel to the U.S.; Vacation Travel by Canadians in 1973, September 1974.

U.S. Department of Justice, Immigration and Naturalization Service, Report of the Commissioner of Immigration and Naturalization, 1973 Annual Report.

U.S. Department of Transportation, Federal Highway Administration. "1973 Highway Statistics." Washington, D.C., 1973.

———————. "Nationwide Personal Transportation Study, Report No. 1, Automobile Occupancy." April 1972.

———————. "Nationwide Personal Transportation Study, Report No. 4, Transportation Characteristics of School Children." July 1972.

———————. "Nationwide Personal Transportation Study, Report No. 5, Availability of Public Transportation and Shopping Characteristics of SMSA Households." July 1972.

———————. "Nationwide Personal Transportation Study, Report No. 6, Characteristics of Licensed Drivers." April 1973.

———————. "Nationwide Personal Transportation Study, Report No. 8, Home-to-Work Trips and Travel." August 1973.

———————. "Nationwide Personal Transportation Study, Report No. 10, Purposes of Automobile Trips and Travel." May 1974.

———————. "Nationwide Personal Transportation Study, Report No. 11, Aubomotive Ownership." 1974.

U.S. Environmental Protection Agency, Office of Air and Waste Management. "Transportation Controls to Reduce Automobile Use and Improve Air Quality in Cities: The Need, The Options, and Effects on Urban Activity." EPA-400/11-74-002, November 1974.

———————. Office of Air Quality Planning and Standards. "1972 National Emissions Report." National Emissions Data System (NEDS) of the Aerometric and Emissions Reporting System (AEROS), June 1974.

Mobile Source Air Pollution Control, Emission Control Technology Division, Ann Arbor, Michigan, June 1976.

———————. Mobile Source Air Pollution Control, Emission Control Technology Division, Compilation of Air Pollutant Emission Factors, Supplement 5 (AP-42), December 1975.

———————. Solid Waste Programs Division, June 1976.

GPO 913-922