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Progress Report to Congress on the Standby Motor Fuel Rationing Plans

June 1980

U.S. Department of Energy
Economic Regulatory Administration
Office of Regulations and Emergency Planning



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1. INTRODUCTION

1.1 Legislative Requirement for This Report

This report is prepared in response to the requirements of the Emergency Energy Conservation Act of 1979 (P.L. 96-102, EECA). Section 102 of EECA, entitled "Report on Plan Development," calls for the following information to be transmitted to the jurisdictional committees of Congress:

- A description of the measures taken after the enactment of EECA to establish a rationing system.
- The costs of these measures.
- A description of the additional measures that remain to be taken in establishing a rationing system.
- A timetable for the completion of these additional measures.
- An estimate of the costs of these additional measures.

Part (b) of Section 102 of EECA further calls for a discussion of five specific issues, as follows:

(1) The extent to which ration coupons would be distributed to each end user of gasoline on the basis of such end user's needs.^{1/}

(2) An analysis of having ration rights granted on the basis of individuals licensed to operate motor vehicles on the public roads and highways.

(3) The extent to which the rationing system would meet the needs and hardships of end-users by the use of local boards.

(4) How the rationing system complies with the objective of providing for the mobility needs of handicapped persons.

(5) The steps to be taken to provide adequate allotments for the needs of those in suburban and rural areas, particularly those not adequately served by any public transportation system.

^{1/} Regarding this issue, the Conference Report on EECA (H. Rept. No. 96-516) provides the following statement at page 30:

" ... this requirement is general in nature, and its intent is to ... consider the varying needs of classes of end-users, to the maximum extent practicable.

The plan itself, of course, cannot reflect all such needs. State set-asides and local boards can provide more individualized relief for hardships and needs."

1.2 Organization of This Report

Part 2 of this report summarizes the standby gasoline rationing plan; describes the differences between this plan and the one that was transmitted by the President to the Congress on March 1, 1979; and cites some problems inherent in rationing gasoline.

Part 3 describes the mechanisms contained in the plan for meeting the gasoline needs of end users: the basic allotments for individuals, basic allotments for firms, hardship allotments, and the ration rights market.

Part 4 contains a discussion of the ration rights market, an analysis of the gains that result from permitting the exchange of coupons, and an estimate of what the price of a coupon would be in a 20 percent shortfall.

Part 5 examines the economic impacts of the plan: how rationing would affect the average motorist in a 20 percent shortfall, how the plan would affect households in different income groups, and how rural, suburban and urban households would fare under rationing. The appendix to Part 5 contains an analysis of the alternative of issuing allotments to all licensed drivers and compares this alternative with the allotment mechanism based on motor vehicles.

Part 6 provides a description of the measures taken to date, since the enactment of the EECA, to develop a gasoline rationing system, and the costs of these measures. Part 6 also includes a discussion of the measures necessary to bring the system to a satisfactory state of readiness, the estimated costs of these measures, and a timetable for their completion. Part 6 concludes

with a brief discussion of diesel fuel rationing; its inherent problems and the resultant need to address it separately from gasoline rationing.

2. SUMMARY AND DESCRIPTION OF THE RATIONING PLAN

2.1 Principal Features of the Plan

This section summarizes the guiding concepts and operational principles of the plan, which is designed to carry out, to the maximum extent possible, the statutory mandate of EPCA, including the dual objectives to distribute ration rights among the states on the basis of historical use and to provide equitable distribution among all classes of end-users. A rationing program under this plan would work in the following manner.

2.1.1 Individual Entitlements

- Individuals with validly registered motor vehicles would be eligible for a ration allotment for each such vehicle.
- It is DOE's intention to limit the number of vehicle-based ration allotments to which a person or household would be entitled.
- In general, the total value of ration rights, in gallons of gasoline, issued to classes of end users within each state would be determined on a state-by-state basis that would take into account historical use of gasoline by those classes of end

users in that state. Each class of end user within a state would share a shortfall equally (as measured against historical use) with the corresponding class of end users in other states), and the basic individual ration allotment would vary from state to state as a reflection of differences in historical gasoline consumption among the states.

- Local rationing offices under the jurisdiction of local boards would provide supplemental allotments to hardship applicants.

2.1.2 Provision for the Handicapped

- Responsibility for providing supplemental allotments that take into account the mobility needs of the handicapped would be delegated to the states and, in turn, to local offices by each state.
- Procedures and guidelines that would provide for the needs of the handicapped would be developed prior to the start of rationing in consultation with appropriate Federal, state and local governmental agencies and organizations representing the handicapped.

2.1.3 Business Entitlements

- In addition to allotments based upon vehicle ownership, supplemental allotments would be issued to businesses that would be reflective of their historical use of gasoline.

2.1.4 Priority Activities

- Supplemental allotments equal to a relatively high percentage of base period use would be provided to businesses, units of government, and other organizations that merit priority status by providing essential public services.

- Priority activities currently identified in the plan are:

- (1) Emergency services, which include law enforcement, fire fighting, emergency medical services, snow removal, telecommunications services, utilities services, search and rescue operations, and the U.S. Postal Service.

- (2) Sanitation services.

(3) Public passenger transportation, including taxicabs.

(4) The Department of Defense, with respect to its activities directly related to the maintenance of national security.

(5) Agricultural production, processing, and distribution.

(6) For-hire mail and small parcel transportation and delivery.

(7) Energy production.

(8) Short term vehicle rental.

(9) Newspaper distribution.

With the exception of item (5) (agriculture) allotments for these priority activities within each state will be deducted from the total allotments made to each state on the basis of its historical use. Agriculture allotments will be deducted from the total allotments available nationally before distribution is made to the individual states. This treatment of agriculture will not affect the size of the total allotments

for agriculture but will avoid distortions in the allotments to other categories of end users that might otherwise be caused because of the size of the agricultural priority category.

2.1.5 Reserves

- State Ration Reserves would be established in each state for use by state and local offices in issuing hardship allotments. States would have considerable discretion in the use of their ration reserves, subject to general DOE standards and guidelines.
- The responsibilities of state and local governments for the distribution of allotments would increase commensurate with their capability and willingness, and the percentage of the state's allotments set aside for the reserve could be increased accordingly.
- DOE would establish a national ration reserve to meet national disaster needs and to provide allotments to Canadian and Mexican firms that use their vehicles to do business in the U.S.

2.1.6 Issuance of Ration Allotments

- Ration allotments would be issued in the form of government ration checks, which could be exchanged for ration coupons at designated coupon issuance points. Checks would be issued in advance of each ration period, with the allotment amount printed on the check.

2.1.7 Coupons

- DOE would enlist the participation of a variety of qualified organizations as coupon issuance points. These organizations would be supplied with coupons by DOE and would serve as ration check "cashing" points for recipients of government ration checks.
- Different series of coupons would be distributed. DOE would establish for each series the date at which it becomes valid. Coupons would be valid until used, or until the end of the rationing program.

2.1.8 Ration Banking

- Individuals and organizations that use large quantities of gasoline could open ration banking accounts at participating ration banks.

- Account holders could deposit valid coupons or ration checks to their accounts and write ration checks against their accounts.

- Gasoline suppliers would open redemption accounts at ration banks. Suppliers would deposit in these accounts cancelled ration coupons and ration checks (or redemption checks, where applicable) received for the sale of gasoline. Suppliers would write redemption checks on these accounts to cover the purchase of gasoline.

2.1.9 Ration Rights Market

- DOE would permit the sale or transfer of ration rights. DOE would impose no price or other controls on this market except as may be necessary to prevent abuse or to prevent those activities deemed disruptive of the rationing program.

- DOE would provide for the dissemination of information on the prices and availability of ration rights in the market.

- DOE would have the authority to buy or sell ration rights in order to maintain an ongoing balance between the number of ration rights

outstanding and the supply of gasoline and to ensure the availability of ration rights where needed.

2.2 Differences Between This Plan and the Plan Transmitted to the Congress on March 1, 1979

The major differences that the new plan incorporates are:

1. Provides for the distribution of ration rights among the states on the basis of gasoline use in the most recent base period.^{1/}
2. Provides for the issuance of allotments based on historic use to firms. In the earlier plan, most firms would have received allotments based solely on motor vehicle ownership.
3. Expands the priority category to include agricultural production and distribution and commercial fishing.
4. Further expands the priority category to include taxicabs and rental vehicles; telecommunications activities; utilities services; for-hire mail and small parcel transportation and delivery; search and rescue activities; energy production; and newspaper distribution.

^{1/} This provision was incorporated by amendment in the March 1, 1979, plan.

5. Provides DOE with the authority, subject to available appropriations, to buy and sell ration rights whenever necessary to effect an equilibrium between the number of issued ration rights and the actual supply of gasoline.
6. Provides for an expanded state role in administering hardship allotments and addressing imbalances within each state.

2.3 Limitations of Rationing

Based on comments that DOE has received from the public, many people appear to believe that rationing is a panacea--a simple and equitable way to curtail gasoline use. In fact, many commenters have proposed that rationing be implemented now as a long-term measure to help conserve fuel.

On the basis of our own analysis, we believe that the high cost and the complexity of rationing make it ill-suited for use except in response to a severe petroleum supply interruption. Even in such a situation, the imposition of rationing would be a massive and extremely complex undertaking. It would involve, in effect, creating an entirely new currency, complete with checking accounts.

2.3.1 Inconvenience

Rationing would cause considerable inconvenience:

- o to firms, in applying for their ration allotments;

- to both individuals and firms, in obtaining and using their allotments;

- to the petroleum industry, in receiving, handling, and transferring ration rights.

2.3.2 Abuse

There would be powerful incentives for individuals to profit from rationing by unlawful means. In a 20 percent shortfall, the ration rights distributed each quarter would be worth roughly \$40 billion. Strenuous efforts would be required to keep fraud and abuse within tolerable bounds and to preserve the integrity of the system.

2.3.3 Errors

The operation of massive and relatively untested data systems would likely result in many errors being made. For example, DOE estimates that, for the first rationing quarter, as many as 10 million motorists might receive ration allotments to which they were not entitled and as many as 15 million individuals might fail to receive allotments to which they were entitled.

2.3.4 Other Considerations

Other difficulties inherent in a standby gasoline rationing plan are its high cost (see Part 6) and the large Federal bureaucracy that would be required to run the system.

In the light of these problems and costs, DOE has concluded that rationing can be justified only as a response to a severe gasoline shortage--and even then only if a better alternative cannot be identified.

2.4 Rationing and the Price Level

In evaluating rationing as an emergency measure, it should be kept in mind that the usefulness of the measure is predicated on the existence of a volumetric shortage at the prevailing price. If demand were to exceed supply at the prevailing price, then rationing would be a relatively equitable and efficient way to equilibrate the market. If during the shortfall, however, the world price of crude were to rise to a level that would push the price of gasoline at the pump up to its new equilibrium level, then there would be no shortage. In such a case, ration rights would have no value and rationing would serve no purpose.

3. MECHANISMS FOR MEETING GASOLINE NEEDS

This part of the report discusses the four mechanisms contained in the rationing plan for meeting the gasoline needs of end users:

(a) A basic per vehicle allotment for individual motorists.

(b) An allotment for firms that is a percentage of gasoline use in a recent base period.

(c) Hardship allotments for individuals and, in some cases, also for firms.

(d) The ration rights market, which allows any individual or firm to purchase additional ration rights at a market determined price.

3.1 Basic Allotments for Individuals

The costs of a gasoline shortfall would be borne principally by those who use gasoline: the more gasoline used, the higher the cost. Those who use little or no gasoline would incur some indirect costs, for example, costs arising from the higher prices of producing goods and providing services directly related to the shortfall, but these would be small compared to the direct costs borne by motorists. Accordingly, if a ration rights distribution system is intended to provide an equitable sharing of the burden of the shortfall, it should be based on the distribution of rights according to the cost incurred, in other words, according to essential fuel use.

Households vary tremendously in their driving habits, according to their particular circumstances and preferences. Even households at the same income level and in the same geographical area may use widely differing amounts of gasoline based on such factors as number of workers, commuting distances, availability of public transportation, proximity to shopping, and medical needs.

Given this individual variation in fuel consumption, and given the difficulty of determining, for each household, the ease with which driving can be curtailed, DOE has decided to:

- (a) distribute entitlements according to a rough indicator of gasoline use,
- (b) rely on the ration rights market to transfer coupons among households in response to relative demands, and
- (c) give state and local rationing offices the responsibility for awarding additional allotments to those who would otherwise experience severe hardship.

The two principal alternatives upon which to base allotments for personal (non-business) use are motor vehicle ownership and possession of a driver's license.^{1/} Neither is entirely satisfactory as an indicator of gasoline Use. However, analysis

^{1/} A third alternative--voter registration files--is discussed briefly in Appendix A to Part 3.

conducted to date establishes that the number of motor vehicles owned by a household is a better indicator of the annual mileage driven by the household, and thus of the household's fuel use. This is shown in Exhibit 3-1, which presents coefficients of correlation between annual vehicle miles of travel (AVMT) and several other variables. The number of automobiles has the highest correlation with AVMT.

Available data also indicate that fuel use increases roughly in proportion with the number of vehicles owned. Annual mileage driven by a two-car household is slightly more than double that driven by a one-car household; and households with three or more cars drive nearly three times as much as single-car households. This is shown in Exhibit 3-2. The data in Exhibit 3-2 also show that both households with two automobiles and those with three or more automobiles do a larger proportion of their driving for commuting and related business than is the case for one-car households.

For these reasons, an allotment system that is based on motor vehicles owned would distribute entitlements in approximate accordance with normal fuel use. The basic allotment should meet the essential driving needs of most households. For a household whose essential fuel needs exceed its basic allotment, the mechanisms described in Section 3.3 and 3.4 below, hardship allotments and the ration rights market, provide for obtaining additional coupons.

Exhibit 3-1

Coefficients of correlation between annual vehicle miles of travel by a household and selected household characteristics:

Number of Drivers	.54
Number of Persons	.23
Number of Automobiles	.66
Household Income	.49
Number of Workers	.44

Source: Robert Gorman, Draft Report - "Fuel Rationing and the Determinants of Annual Household Vehicle Travel," Federal Highway Administration, Department of Transportation, 1979.

Exhibit 3-2

ANNUAL VEHICLE-MILES OF TRAVEL PER HOUSEHOLD
BY TRIP PURPOSE AND AUTOMOBILE OWNERSHIP

Trip Purpose	Car(s) per Household						All Household	
	One		Two		Three or More			
	Miles	%/Total	Miles	%/Total	Miles	%/Total	Miles	%/Total
Earning a living								
Home-to-work	3,307	31.8	7,466	34.9	11,020	36.8	4,183	33.7
Related business	736	7.1	1,905	8.9	2,224	7.4	983	7.9
Subtotal	4,043	38.9	9,371	43.8	13,244	44.2	5,166	41.6
Family business								
Shopping	857	8.2	1,572	7.3	1,548	5.2	929	7.5
Medical and dental	206	2.0	308	1.4	326	1.1	202	1.6
Other	1,178	11.3	2,126	9.9	2,644	8.8	1,270	10.2
Subtotal	2,241	21.5	4,006	18.7	4,518	15.1	2,401	19.3
Civic, educational and religious	420	4.0	1,223	5.7	1,485	4.9	612	4.9
Social and recreational								
Visiting friends and relatives	1,500	14.4	2,288	10.7	2,491	8.3	1,497	12.0
Pleasure rides	348	3.3	555	2.6	763	2.5	381	3.1
Vacations	230	2.2	622	2.9	649	2.2	320	2.6
Other	1,513	14.5	3,053	14.3	6,493	21.7	1,896	15.3
Subtotal	3,591	34.5	6,518	30.5	10,396	34.7	4,094	33.0
Other and unknown	111	1.1	287	1.3	331	1.1	150	1.2
All purposes	10,406	100.0		100.0	29,974	100.0	12,423	100.0

Source: Data from unpublished tables T-5 and H-18 from the Nationwide Personal Transportation Survey conducted by the Bureau of the Census for the Federal Highway Administration, 1969-70.

3-5

3.2 Allotments for Firms

There is a wide range of variation in the intensity with which businesses use their vehicles and in the opportunities for them to reduce fuel use without incurring significant costs. Consequently, ration allotments based on motor vehicles owned would be grossly inadequate for a large number of businesses, requiring them to make extensive purchases of coupons.

Accordingly, the rationing plan would provide allotments for firms as a percentage of each firm's base period consumption of gasoline. This allotment method would minimize disruption to the economy, since it more closely approximates the fuel requirements of businesses as evidenced by their historical consumption. Therefore, each firm would be eligible for a supplemental allotment which, together with the basic vehicle allotment, would provide a specified percentage of its base period use. Firms which use their vehicles less intensively than the average may not qualify for a supplemental allotment, whereas other firms may qualify for significant supplemental allotments. A firm would apply for a supplemental allotment by submitting an application indicating the amount of gasoline purchased during a designated base period. To facilitate processing these applications, firms would be encouraged to develop this information in advance, as a readiness contingency measure, so that supplemental allotments could be issued at the beginning of implementation. There would be a fee charged to cover the cost of base period data collection and processing.

The percentage of base period use to be applied during rationing would depend on such factors as the severity of the shortfall and the nature of the firm's activities.

Because nearly all gasoline users can conserve fuel in an emergency, even priority users would in most cases receive allotments below 100 percent of base period use. An exception to this policy might be made for public transportation, whose ridership would be expected to increase greatly during a gasoline shortage.

3.3 Hardship Allotments

Because no centrally administered rationing system can accommodate the many diverse requirements of households throughout the U.S., the rationing plan would give local boards an important role in meeting special individual needs. DOE believes that individual hardship decisions can be made more fairly and efficiently at the local level, close to the individual motorist. States would be given administrative jurisdiction over the local board system, and would have considerable flexibility in the way the boards operate, subject to broad DOE guidelines.

Many classes of applicants would be eligible for assistance from local boards, including handicapped persons, low-income, long-distance commuters, migrant workers, and others whose circumstances meet the qualifying criteria established by each state and approved by DOE.

Applicants would present specific requests for assistance to the local boards, and would be granted supplemental ration rights allotments tailored to their particular needs.

3.3.1 State Ration Reserve

For each ration period, a percentage of each state's total number of ration rights would be set aside as a State

Ration Reserve (SRR). The SRR would be used to meet the hardship needs of persons in the state and to provide for the mobility needs of the handicapped.

The SRR would initially be equal to a minimum of five percent of the state total number of ration rights. However, a state could apply to DOE to increase or reduce the percentage of ration rights to be included in the SRR, subject to DOE approval. Although some states may be unwilling or unable to assume the additional administrative costs of a large SRR, many states can be expected to assume an active role in administering the SRR and will use it as an effective tool for responding to the needs of citizens within the state.

3.3.2 Establishment of State Rationing Offices and Local Boards

After the Standby Gasoline Rationing Plan is approved by Congress, DOE will establish procedures for delegation of functions to a State Rationing Office and to officers or local boards (of balanced composition reflecting the community as a whole) of a state or political subdivision thereof. Within 60 days after DOE establishes these procedures, states may submit to DOE plans to receive delegations of authority and to administer the SRR. Submission of state plans and their approval by DOE will be prerequisites to receiving the ration rights for the SRR. The plans must include: (1) how the state proposes to establish a State Rationing Office and local boards to meet hardship needs and to provide for the mobility needs of the handicapped; (2)

efforts to be undertaken during the implementation of the rationing plan to meet the needs of those persons in suburban and rural areas, particularly mid-sized cities, small towns and rural communities not adequately served by any public transportation system; (3) the percentage of the state total number of ration rights requested by the state to be reserved as the SRR; and (4) procedures to prohibit recipients of hardship allotments from selling ration rights received as part of such allotments. This procedure has been adopted because states and their political subdivisions are best able to meet the hardship needs of citizens during an emergency.

States will have broad discretionary authorities in determining how the SRR will be distributed among local boards within the state. If hardship is concentrated in rural areas, for example, a state can distribute to local boards in such areas a greater share of the SRR.

3.3.3 Hardship Applications and Guidelines

DOE will, in consultation with the states, develop general guidelines regarding eligibility for hardship allotments. It is expected that hardship allotments will be limited to those whose essential driving needs exceed their allotments of ration rights and, in addition, whose incomes are inadequate to allow them to purchase the additional rights. Examples of those who might qualify for hardship allotments are:

- Individuals who, because of a handicap or the absence of alternative means of transportation, must use their automobiles to commute to work, whose ration allotments are insufficient to provide fuel for this commuting, and whose incomes are inadequate to permit the purchase of coupons in the ration rights market.
- Individuals who need to drive extensive distances to obtain necessary medical care, for themselves or for other persons, and who cannot reasonably be expected, because of income limitations, to purchase the needed coupons.
- Low-income migrant workers traveling to and from work sites.

Hardship allotments will not be provided to sustain discretionary driving or for the use of those individuals with sufficient incomes to enable them to purchase coupons on the ration rights market.

State Ration Offices and local boards will be given considerable flexibility in interpreting the criteria for the determination of hardship eligibility and in determining whether to grant hardship allotments in specific cases. It is DOE's view that such flexibility is necessary to permit adequate consideration to differences in need between states, and among jurisdictions within particular states.

Appendix B to Part 3 contains a discussion of projected operating procedures for local boards.

3.3.4 Mobility Needs of the Handicapped

This section provides an overview of how the rationing plan provides for the mobility needs of handicapped persons.

Local boards will be required to give careful consideration to providing for the essential gasoline needs of the handicapped. States must provide specific criteria to local boards for evaluating these needs, and DOE approval of state rationing plans will be contingent upon review and approval of these criteria. DOE will also work with Federal, state and local agencies and organizations representing the handicapped in developing policy guidelines for supplemental allotments to handicapped persons.

Local boards will be expected to provide for adequate representation of the interests of handicapped individuals on their staffs and on their volunteer panels. Additionally, local boards will be expected to implement procedures for the expedited handling of applications from mobility-impaired persons. These procedures would include:

- the development of special application forms;
- permitting proxies to appear personally before a local board on behalf of handicapped individuals;
- measures to ensure unimpeded access to local boards;
- special appeal procedures for the handicapped.

3.4 The Ration Rights Market

The preceding sections have described the allotment mechanisms in the rationing plan that are designed to meet the needs of most individuals and firms. While these steps cannot assure that all firms and individuals will receive sufficient ration rights to purchase gasoline for their essential travel, it does provide for the majority of gasoline end users in a systematic way, with minimal administrative requirements.

Another element that will help reduce the inconvenience of rationing, and greatly increase the efficiency with which gasoline is used, is the provision to allow coupons to be transferable. It is expected that those recipients who can get by with less than their full allotment will sell coupons to firms or individuals that wish to purchase additional rights. Thus, free market forces will permit an adjustment of ration rights on mutually agreeable terms with minimal need for Federal intervention. This is explained more fully in Part 4.

Appendix A to Part 3

THE USE OF VOTER REGISTRATION FILES
AS A BASIS FOR DISTRIBUTING RATION ALLOTMENTS

Consideration was given to the possibility of distributing ration allotments to all registered voters, based on voter registration files. On the basis of a preliminary analysis, this alternative was rejected for the following reasons:

- Approximately one-third of all adults are not registered.
- Registration is handled by 13,000 local election jurisdictions, which would make it exceptionally difficult to compile a national file.
- The registration procedures differ among states and, to a large extent, among jurisdictions within each state. Approximately half of the states leave procedures up to the local jurisdictions.
- One state has no voter registration files.
- Most registration files are manual systems, with little or no computerization.

◦ It is considered difficult to prevent multiple registration in many states; accordingly, there would be substantial opportunities for an individual to obtain more than one allotment.

Appendix B to Part 3

PROJECTED OPERATING PROCEDURES OF LOCAL RATIONING BOARDS

This section provides an overview of how a local rationing board might function under a rationing plan. Guidelines for specific operating procedures would be developed during the period, following congressional approval of the plan, during which the plan is brought to a state of readiness.

Each state must develop and submit as part of its state rationing plan, a proposed methodology for the creation of a system of local rationing boards for distribution of the SRR. These boards should be geographically dispersed throughout the state to ensure that all residents have reasonable access to a local board. Exhibit 3-3 illustrates a possible organizational structure for local boards.

Major functions of a local board should include:

- o verification of information contained in hardship applications;

- o approval or disapproval of hardship applications, based on eligibility criteria provided by the state rationing office (SRO);

- o informing applicants of board decisions and dispensing hardship allotments to approved applicants;
- o receipt and review of requests for reconsideration of initial board decisions;
- o preparation of periodic reports on all rationing activities for submission to the SRO.

Local rationing boards will receive and process applications for hardship allotments by individuals and firms. Policy and procedural guidelines will be developed by DOE, in consultation with the states and applicable Federal agencies, for use by the local boards in reviewing hardship applications. Local board officials will use these guidelines to make decisions on the validity of the hardship application, and will dispense a hardship allotment to applicants accordingly.

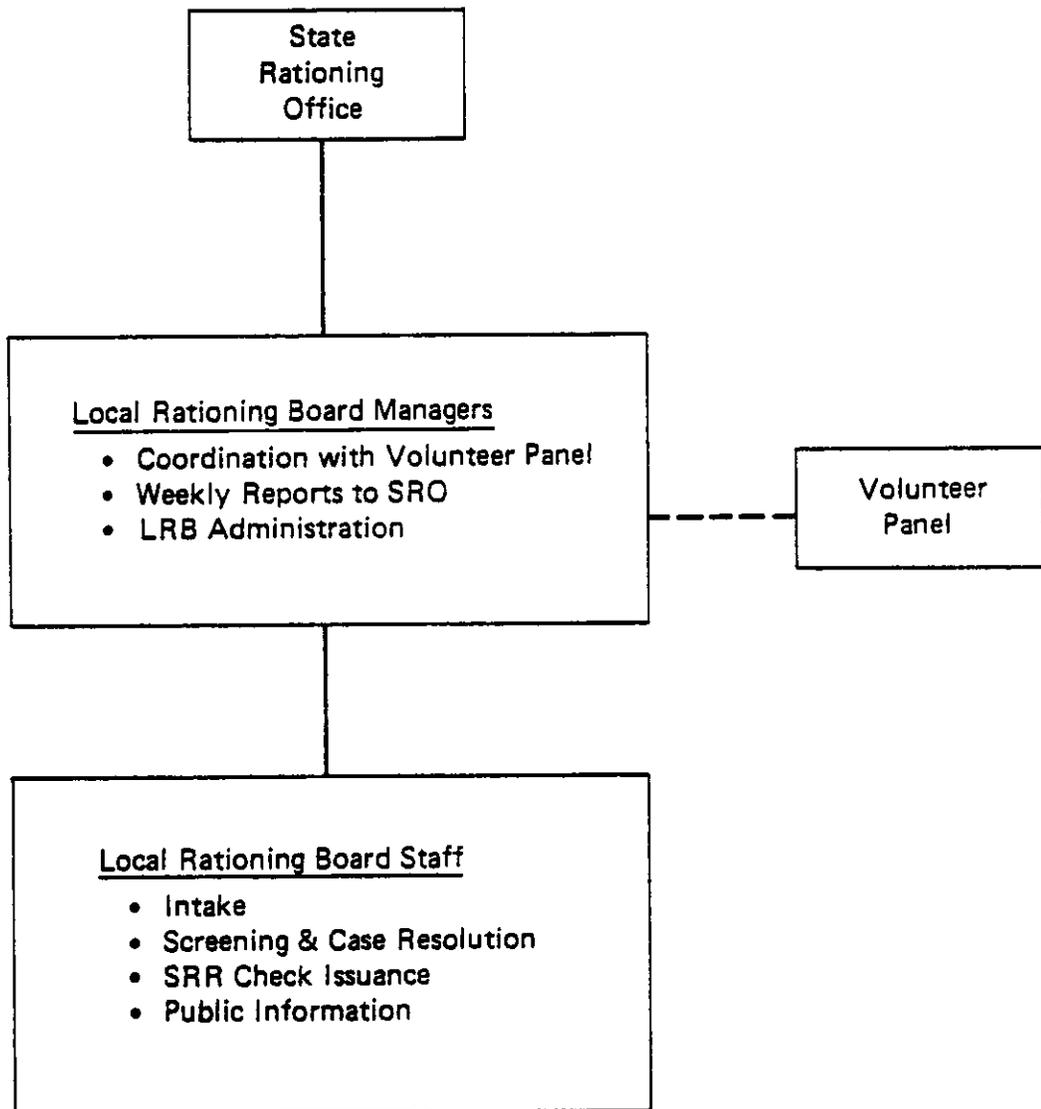
These procedural guidelines should clearly establish specific eligibility criteria and limitations of awards to be made for each hardship category. The guidelines should also contain rules for the periodic disbursement of additional allotments to applicants with recurring hardships (e.g., long-distance, low-income commuters or low-income, handicapped individuals). The guidelines should be sufficiently explicit to allow clerical review and approval of routine hardship requests.

The State Ration Reserve is intended principally to provide relief to individual gasoline consumers, although some requests for hardship allotments by firms may be approved.

Any negative decision made on a hardship application will be reviewed in the event that the applicant files a request for reconsideration. The initial review will be conducted by a volunteer panel (Exhibit 3-3), created for this purpose, at the local board. Appeals of decisions made by the volunteer panel should be directed to the State Rationing Offices.

Volunteer panel members will be selected according to procedures developed by each state and included in the state rationing plan submitted to DOE. A key requirement for the panel is that its members represent the community as a whole, with members chosen to represent citizen groups and interests in the area to be served. Specific procedural guidelines and assistance in adjudicating cases will be provided by the SRO.

EXHIBIT 3-3. PROPOSED LOCAL RATIONING BOARD ORGANIZATIONAL STRUCTURE



4. THE RATION RIGHTS MARKET

An essential feature of the Standby Gasoline Rationing Plan is the use of market forces to ensure a high degree of flexibility and to increase the efficiency with which gasoline would be used during a serious supply shortage. Sections 4.1 and 4.2 discuss the rationale and implications of having a ration rights market. They are included here both to explain the significance of ration rights transferability and to address the congressional and public concerns that have been expressed with regard to this transferability. Section 4.3 contains a projection of the coupon price in a 20 percent shortfall. The Appendix to Part 4 contains a discussion of the similarity between rationing with a ration rights market and tax with the proceeds rebated to motorists.

4.1 Why Ration Rights Have Value

With a 20 percent gasoline shortfall, in the absence of Federal intervention, the market price for gasoline would rise to the point at which the aggregate demand for gasoline would equal the available supply. As is discussed in Section 4.3 below, the equilibrium price would be very substantially above the preshortfall price. This sharp rise in the price at the pump would result in a redistribution of income of roughly \$160 billion per year from gasoline consumers to suppliers.

If the price were controlled at a level substantially below the equilibrium level, and if no other mechanism were employed to clear the market, the result would be lengthy gasoline lines--

probably several hours long. In some cases queuing may be even more unpleasant than higher prices. Moreover, long lines at the pump impose a massive cost on the economy in terms of reduced productivity and wasted time.

Rationing is an alternative to queuing ^{1/} and to higher prices. By placing a quantitative limit on the total number of gallons that can be purchased, rationing balances demand with available supply at a price below the free market level.

It is commonly believed that rationing distributes gasoline supplies. This is not the case. What rationing does do is distribute rights to purchase gasoline at the controlled price. Because the price of gasoline would be maintained below the market clearing level, these rights would have value. The value of a coupon would equal the difference between the equilibrium price of gasoline and a controlled price (or, in the absence of controls, at a price that would nevertheless be below the free market price). That is, the amount that motorists would pay for a one-gallon coupon is the difference between what they would be willing to pay for gasoline and the price at which gasoline would be sold.

Viewed differently, the value of ration rights would reflect the gains that consumers would derive from exchanging rights. Because of the impossibility of distributing ration rights so as

^{1/} Although queuing would be greatly reduced under rationing, it might not be eliminated entirely. Some queuing might result if motorists try to use a disproportionate share of their coupons early in the ration period or if there are lags in transferring gasoline from areas with a surplus to those with a shortage.

to meet the individual needs of every household, some households would receive allotments in excess of their demand for gasoline and others would receive an inadequate supply of rights. This would create pressure for a market, as those with too many rights and those with too few would derive mutual benefit from transferring them.

4.2 Gains From a Ration Rights Market

Some people have suggested that a ration rights market should not be permitted. Permitting the exchange of ration rights is viewed by these people as favoring the rich at the expense of the poor.

Upon studying this issue, it is our conclusion that a ration rights market would not disadvantage low-income households and would have many significant benefits.

A key point in the analysis of ration rights exchanges is that participation would be entirely voluntary. Each vehicle registrant would receive an allotment of ration rights. Motorists could choose to use, save, or dispose of these rights without recourse to the market. No one would be harmed by permitting coupons to be exchanged because no one would be forced to participate in such an exchange.

The ration rights market, like other markets for goods and services, would provide substantial economic benefit. The opportunity to sell rights would provide a strong economic incentive for conservation. Motorists would have an incentive to cut back their driving in order to supplement their income by

selling unused ration rights. Those whose demands exceeded their allotments could supplement their allotments by purchasing additional coupons. While the market price of these rights might be high, giving motorists this option is surely better than the alternative of either setting an arbitrary limit on the number of miles one could drive or resorting solely to a lengthy appeals mechanism involving endless queues and layers of costly and ponderous bureaucracy.

One of the criticisms of the March 1, 1979, rationing plan was that by allowing the transfer of ration rights, wealthy families would get all the gasoline they wanted while the poor were left to suffer. Based on the reasoning presented above, especially regarding the voluntary nature of the market and its benefits in producing income for sellers of rights, the purchase of ration rights by those with above-average demand would be welcomed by other groups choosing to sell rights, while not harming those that chose not to sell.

In light of the significant benefits that would result from a legal ration rights market, such a market should not only be permitted, but actively encouraged. Accordingly, DOE would make provisions for keeping the public informed on market prices and for taking steps to ensure the widespread availability of ration rights at the market-determined price. DOE would have the authority to enter the market as a buyer or seller of ration rights if necessary to adjust the number of ration rights in circulation, maintaining a balance with the supply of gasoline available.

4.3 The Estimated Coupon Price

Vehicle owners have three choices with respect to their coupon allotment. (1) They can use all of their coupons to obtain gasoline. (2) They can use less than their full allotment to obtain gasoline and sell the remainder in the market. (3) They can use all of their allotment and obtain still more gasoline by purchasing coupons in the market. The option selected, and the number of coupons bought or sold, will depend upon the market price of coupons. The coupon market is in equilibrium when the number of coupons offered for sale is equal to the number that others wish to buy at the prevailing price.

4.3.1 Calculation of the Coupon Price

The remainder of this section is devoted to the development of the quantitative projection of the price of a ration right in a hypothetical 20 percent shortfall. The approach is based on the premise that the price of a one-gallon coupon (P_c) will equal the difference between (a) the market price of gasoline that would prevail during the shortfall if there were no price controls (P_m) and (b) the controlled price at the pump, including any taxes and fees, that would obtain under rationing (P_g):^{2/}

^{2/} If a decision were made not to impose controls on the price of gasoline, this price and the price of coupons would be jointly determined in the market. The price of gasoline would then be higher than the pre-shortfall price and the price of coupons correspondingly lower.

$$P_C = P_m - P_g$$

The market clearing price during the shortfall is the price at which demand would be cut back sufficiently to equal the available supply. Designating as P_p the pre-shortfall price of gasoline, R as the ratio of gasoline supply during the shortfall to the pre-shortfall supply, and E as the elasticity of demand for gasoline, the shortfall market clearing price (P_m) can be expressed:

$$P_m = P_p R^{(1/E)}$$

4.3.1.1 Elasticity of Demand

The elasticity of demand at a point on a demand curve is defined as the rate of percentage change in demand divided by the rate of percentage change in the real price. As it is a ratio of two percentages, the elasticity is a pure number, that is, it has no units of measurement.

Two points should be noted. First, the elasticity relates changes in demand to real price changes, that is, changes that have been corrected for any general inflationary effect. Second, the relationship is taken net of changes in income and other factors that might be expected to affect demand.

Estimation of the elasticity of demand for any product is subject to a wide margin of error. Estimates of the gasoline demand elasticity range from -0.1 to -0.4. DOE has examined these estimates and has concluded that the most likely value, with respect to short-run changes in demand in response to small

changes in price is in the range of -0.15 to -0.2. An elasticity of -0.2 has been used generally in DOE's short term projections, although the more conservative estimate of -0.15 was used by DOE in examining the conservation potential of a 10 cent per gallon gasoline fee.

Estimates of the demand elasticity for gasoline are based on data compiled for recent years. They are valid only for real prices that have been observed during this period. The data provide only a limited basis for extrapolating beyond the range of the observed data, for example, for relating demand to a price that is far in excess of the current price. Economic theory, however, does suggest that the elasticity will be higher (in absolute terms) at a higher price. With respect to the much higher price that would be necessary to clear the market for gasoline in a 20 percent shortfall, we believe that the relevant elasticity is greater (in absolute terms) than -0.20, and is probably equal to about -0.25. This figure is used in the computations in the remainder of this report. However, for comparison, we also present some calculations based on an elasticity of -0.15, which we think is at the low end of the reasonable range of estimates given the large price increases that are likely to occur. To illustrate the difference between the two elasticities, a doubling of the price would reduce demand by 10 percent with an elasticity of -0.15 and by 16 percent with an elasticity of -0.25.

4.3.1.2 The Coupon Price

In calculating what the price of a ration coupon would be in a 20 percent shortfall, the following assumptions have been made:

- (1) The price at the pump prior to the shortfall (P_p) is assumed to be \$1.20. This price is assumed to be an equilibrium price.
- (2) It is also assumed, for simplicity, that the world price of petroleum does not rise during the shortfall and that product price controls are maintained, so that the price at the pump remains \$1.20, exclusive of any fees imposed.
- (3) To cover the administrative costs of rationing, it is further assumed that a three cent per gallon fee is imposed at the pump, raising the controlled price (P_c) to \$1.23.
- (4) The elasticity of demand for gasoline is -0.25. The equation for the shortfall market-clearing price can be written:

$$\begin{aligned} P_m &= P_p R^{(1/E)} \\ &= \$1.20 (0.8)^{(-4)} \\ &= \$2.93 \end{aligned}$$

The market value of a one-gallon coupon (P_r) is then given by:

$$\begin{aligned} P_r &= P_m - P_c \\ &= \$2.93 - \$1.23 \\ &= \$1.70 \end{aligned}$$

If the retail gasoline price were higher than \$1.20, say \$1.50, when the shortfall occurred, and if this higher price were also an equilibrium price, then the new equilibrium price during the shortfall and the coupon price would both be higher as well. It should be borne in mind that any increase in the price of gasoline above the present price would lead to a further reduction in demand. Consequently the shortfall would be measured relative to a level of gasoline consumption that would already be below the present level. A 20 percent shortfall, given a demand elasticity of -0.25, can be expected to raise the price by 144 percent, regardless of what price initially obtains. If the pre-shortfall price were \$1.50, and if demand had adjusted to this price, then the equilibrium price with a 20 percent shortfall would be \$3.66 and the per gallon coupon price would be \$2.13. Similarly if the pre-shortfall price were \$1.75, the shortfall coupon price would be \$2.49.

The world price of crude might rise substantially during (possibly as a result of) the shortfall. This would increase the price of gasoline at the pump and would lower the value of a coupon.

The calculations presented above are based on a demand elasticity of -0.25. If the elasticity were -0.15, the price would have to increase by 343 percent to reduce demand by 20 percent in a shortfall. This would imply a per gallon coupon price of \$4.09 if the pre-shortfall price were \$1.20, \$5.12 if the pre-shortfall price were \$1.50, and \$5.98 if the pre-shortfall price were \$1.75.

5. ECONOMIC IMPACTS OF RATIONING

Part 5 illustrates the way the rationing plan would affect the average motorist, and discusses how these effects might vary according to a motorist's income class and residence in urban or non-urban areas.

5.1 Effects of Rationing on the Average Motorist

This section shows how many gallons of gasoline an average motorist would be able to purchase with a basic ration allotment, how many miles could be driven with such an allotment, in vehicles of varying fuel efficiency, and how much money an average motorist would have to spend for additional coupons or would receive from the sale of coupons.

5.1.1 Gallons of Gasoline Obtainable with a Typical Ration Allotment

In 1978, the average private passenger car was driven 10,046 miles per year at a fuel efficiency of 14.06 miles per gallon of gasoline, for an annual total of 715 gallons of gasoline consumed, or 60 gallons per month.^{1/} Total gasoline consumption in the United States in 1978 was 112.4 billion gallons, of which firms (including governments and nonprofit organizations) consumed

^{1/} U.S. Federal Highway Administration, Highway Statistics 1978, Table VM-1.

about 33 percent,^{1/} or 37.09 billion gallons.

As a result of increases in the price of gasoline since 1977, consumption in 1980 is projected to decline to 105 billion gallons. But, because 1978 is the latest year for which complete data are available, our illustrative calculations will be based on gasoline consumption in that year.

Assuming an overall shortfall in gasoline supplies of 20 percent, the number of gallons available for each private passenger vehicle under the rationing program is computed as follows:

- o 112.4 billion gallons is used as the normal U.S. total consumption.

- o Subtracting 20 percent of the above amount, leaves 89.9 billion gallons per year available in the shortage.

- o Five percent of this amount, or 4.5 billion gallons, would be set aside for the State Ration Reserve and approximately one percent, or 0.9 billion gallons, would be set aside for the National Ration Reserve, leaving 84.5 billion gallons available for distribution.

^{1/} U.S. Federal Highway Administration estimate based on 1977 gasoline use data.

Next we must deduct allotments to businesses and other organizations, including governments. Based on DOE's priority classes in the rationing plan, we estimate that approximately 15 percent of total business use, or 5.56 billion gallons per year, is used for priority activities, principally for agricultural production, and the remainder, 31.53 billion gallons, is used for other business and governmental purposes.

These are the base period usage figures from which ration allotments for firms would be calculated. For illustrative purposes we have assumed that in a 20 percent shortfall, priority firms would receive 90 percent of base period use and all other firms would receive 80 percent of base period use. The allotments to firms in the above example would then be equal to .90 times 5.56 billion gallons (annual base period use by priority firms) plus .8 times 31.53 billion gallons (annual base period use by non-priority firms), for a total allotment to all firms of 30.23 billion gallons per year.

Deducting this amount from the shortfall supply, we get 54.27 billion gallons per year available under rationing for household use. The nationwide average allotment per private passenger vehicle can then be obtained by dividing this total by 107 million privately owned automobiles in the U.S., ^{1/} and by dividing the result by 12 to convert from annual to monthly

^{1/} Based on U.S. Federal Highway Administration vehicle data for 1978.

allotments. This yields a figure of 42.27 gallons per private passenger vehicle per month, which is equal to 70 percent of normal average monthly use. For convenience, we shall round this to 42 gallons per month.

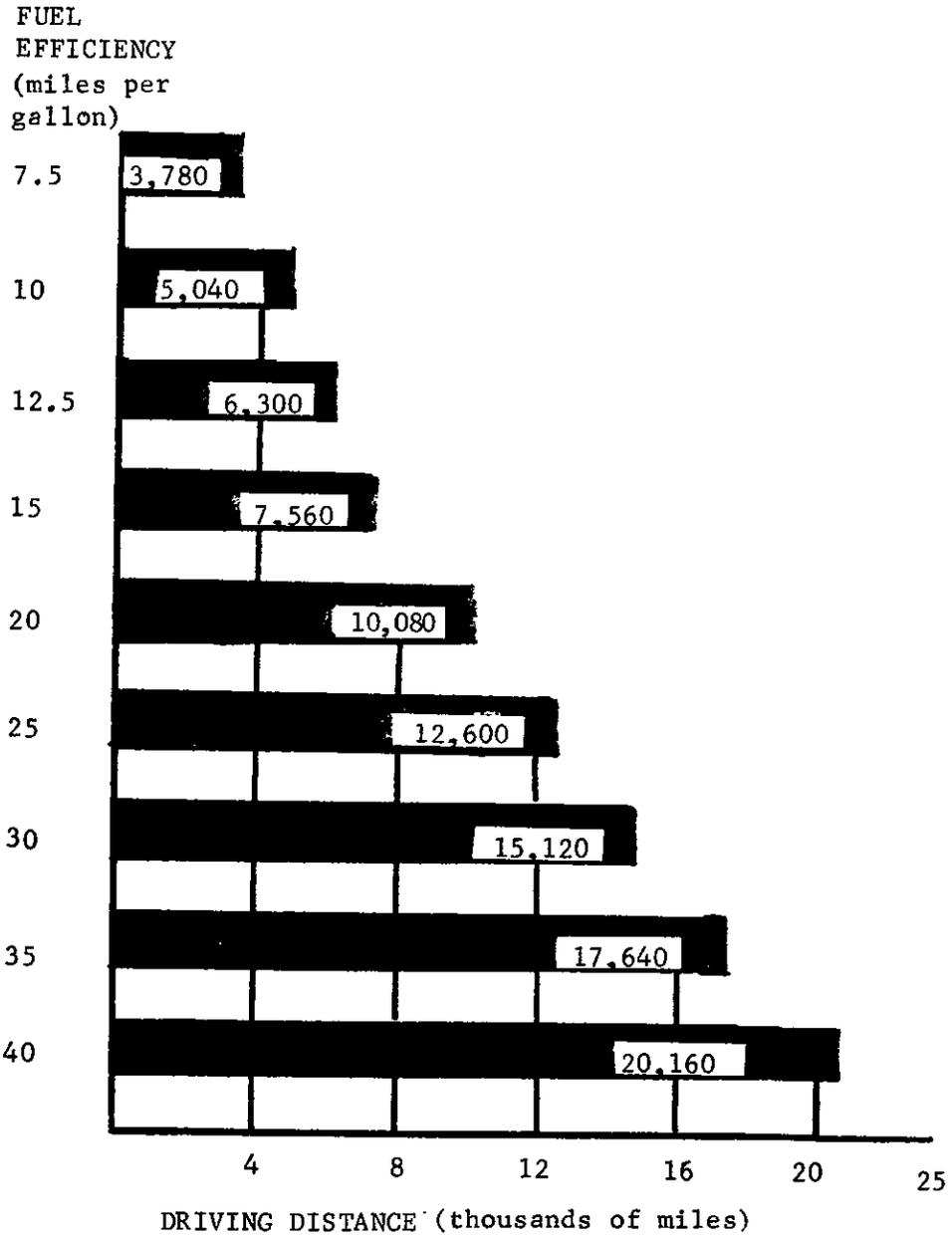
This number needs to be qualified in several important ways. First, it is principally for personal use; persons using their privately owned vehicles in their businesses would be eligible for supplemental allotments for such business use. Second, it is only an average; the allotment level for a specific motorist would be higher or lower than this amount depending on whether historical gasoline consumption in the motorist's state was above or below the national average. Third, it refers solely to the basic allotment and takes no account of hardship allotments that might be provided from the State Ration Reserve. Fourth, because of opportunities to purchase additional coupons, no motorist would be confined to the gasoline obtainable with the basic allotment.

5.1.2 Miles That Can Be Driven with the Average Allotment

Exhibit 5-1 shows the number of miles that could be driven annually with an allotment of 42 gallons per month for vehicles of varying fuel efficiency. As shown in the exhibit, the fuel efficiency of a vehicle makes a major difference in the mileage that could be driven with a typical ration allotment without purchasing additional ration rights. Although a car that gets 10 miles per gallon could be driven only 5,040 miles per year with a 42 gallon per month allotment, a more fuel efficient car that obtains 30 miles per gallon could be driven 15,120 miles

EXHIBIT 5-1

HOW FAR YOU CAN DRIVE IN ONE YEAR
WITH A RATION ALLOTMENT OF
42 GALLONS



with the same allotment, considerably more than the average annual mileage driven in normal times.

5.1.3 The Dollar Value of Fuel Efficiency

Another way to illustrate the significance of vehicle fuel efficiency during the rationing program is to show how much money a motorist driving a specified number of miles per month would have to spend to purchase additional ration rights or would be able to obtain by selling excess coupons.

Using \$1.70 per gallon as the projected value of ration rights, as discussed in Part 4, Exhibit 5-2 shows the savings from coupon sales or cost of coupon purchases associated with driving 10, 15, and 20 thousand miles per year in vehicles with fuel efficiencies ranging from 7.5 to 40 miles per gallon.

5.2 Effects on Different Income Groups

DOE has received comments from some members of Congress and from the public presenting the view that a rationing plan based on motor vehicles would benefit high income households at the expense of households with lower incomes. This concern is based on the assumption that high income households own more vehicles than lower income households, but do not have a commensurately higher need for gasoline.

In response to this concern, we have examined data on vehicle ownership and gasoline use for households grouped according to income level. The information has been obtained from a data file created for the Energy Information Administration and described

Exhibit 5-2

SAVINGS (+) OR COSTS (-)
OF RATION COUPON TRANSACTIONS
BASED ON MILES DRIVEN AND FUEL EFFICIENCY*

(in dollars)

Fuel Efficiency (miles per gallon)	<u>Miles Driven Per Year</u>		
	<u>10,000</u>	<u>15,000</u>	<u>20,000</u>
7.5	-1,410	-2,543	-3,677
10	-843	-1,693	-2,543
12.5	-503	-1,183	-1,863
15	-276	-843	-1,409
20	7	-418	-843
25	177	-163	-503
30	290	7	-276
35	371	128	-115
40	432	219	7

* Assumes coupon price of \$1.70 per gallon and a basic monthly allotment of 42 gallons.

in Service Report SR/EUA/79-18, Impact of Gasoline Rationing Plans on Households of Different Income and Location.

To examine the effects that rationing would have on households at different income levels, the following assumptions were made:

- The per vehicle allotment would equal 70 percent of normal average per vehicle fuel use, or 42 gallons per month. This figure was derived in Section 5.1.
- The average household in each income group would reduce its fuel consumption by 30 percent, to 42 gallons per month, so that fuel use by households as a whole would equal total allotments received by all households.
- Households with excess coupons would sell them to households whose allotments were insufficient.
- The selling price of a coupon would be \$1.70 per gallon.

Column 2 of Exhibit 5-3 presents the figures on the annual net value of allotment sales (purchases) for the average household in each income group. Households with annual incomes below \$10,000 would have extra coupons to sell, thereby increasing their income. This income increment amounts to \$163 per annum for the average household in the lowest income group. Households with higher incomes, on the other hand, would be net purchasers

Exhibit 5-3

PROJECTED AVERAGE HOUSEHOLD ANNUAL NET VALUE
OF ALLOTMENT SALES (PURCHASES)

<u>Household Disposable Income</u>	<u>Allotment Sales (purchases)</u>
(1977 dollars)	(1980 dollars)
Under 5,000	163
5,000 - 9,999	97
10,000 - 14,999	(39)
15,000 - 19,999	(65)
20,000 - 24,999	(154)
25,000 - 29,999	(158)
30,000 or more	(97)

Source: Department of Energy, Energy Information Administration,
Service Report SR/EUA/79-18, Impact of Gasoline Rationing
Plans on Households of Different Income and Location,
November 1979.

of coupons. Expenditures would amount to \$65 per annum for the average household in the \$15,000 to \$20,000 income group and would exceed \$150 per annum for households with incomes between \$20,000 and \$30,000.

These figures indicate that lower income families would likely gain net income under a vehicle based plan.

The Appendix to Part 5 examines the alternative of distributing ration allotments to all licensed drivers and compares the income distributive effects of such a plan with the vehicle plan. The analysis shows that households with incomes below \$10,000 would obtain a greater benefit from a plan that distributed allotments to all licensed drivers than from one that distributed allotments to motor vehicle owners. However, the vehicle based plan would provide allotments more nearly in accordance with need.

5.3 Suburban and Rural Areas

Several members of Congress have expressed concern for the greater fuel needs of rural and suburban motorists, relative to urban motorists, both because of the longer distances typically driven by those in rural and suburban areas and because these areas generally have less extensive public transportation than do urban areas.

In response to this concern, we have examined data on fuel use for households by area of residence and have analyzed how the average household in each area would fare under the rationing plan.

Exhibit 5-4, column 1, presents data on annual vehicle miles driven per household, by place of residence, for 1974. Column 2 presents information on household ownership of motor vehicles. Column 3 contains information on miles traveled per vehicle owned.

Suburban and rural households do tend to drive considerably more on average than urban households, as shown in Exhibit 5-4, column 1. However, this additional driving does not represent a more intensive use of vehicle, but rather the operation of a larger number of vehicles, as shown in columns 2 and 3 in the Exhibit. Miles traveled per vehicle is surprisingly constant among the three groups of households.

The vehicle based allotment mechanism in the Standby Gasoline Rationing Plan is well suited to these observed average vehicle use patterns. The plan would distribute ration rights on the basis of registered motor vehicles. Consequently, the average suburban household, with 39 percent more motor vehicles than the average urban household, would receive an allotment that is 39 percent greater. This would provide for the greater fuel needs of suburban residents. Similarly, the typical rural households would receive a 34 percent greater allotment than the typical urban household, enough to cover the greater mileage driven. Accordingly, the plan would appear to treat both rural and suburban households fairly. In this regard, it should be noted that if allotments were distributed instead to all licensed drivers, those in rural and suburban areas would fare less well than under the present plan.

Exhibit 5-4

NUMBER OF MOTOR VEHICLES OWNED AND MILES DRIVEN BY HOUSEHOLDS, FALL 1974

<u>Household Characteristics</u>	(1) Number of miles driven per household <u>(in thousands)</u>	(2) Number of motor vehicles per household <u>per household</u>	(3) Number of miles driven per motor vehicle <u>(in thousands)</u>
RESIDENCE			
Central Cities	13.5	1.14	11.9
Suburban Rings	18.7	1.59	11.8
Outside Metropolitan	17.9	1.53	11.7
ALL HOUSEHOLDS	16.8	1.43	11.8

Source: U.S. Department of Commerce, Bureau of the Census, Selected Data from the 1973 and 1974 Surveys of Purchases and Ownership, Washington, D.C., July 1976 (Revised).

We recognize that the averages presented in Exhibit 5-4 conceal significant differences in driving patterns from one area to another and that, in some states or regions, households may receive allotments that depart substantially from their normal gasoline use. The plan provides the following two additional mechanisms that may help address the needs of rural and suburban motorists.

5.3.1 Equal Sharing of Shortfall

The plan would distribute allotments among states so as to ensure that the states share equitably the burden of the shortfall. Thus the total number of ration rights available to each state would be in proportion to the state's normal fuel consumption. Consequently a state that is predominantly rural and that, for this reason, uses additional gasoline, would receive a larger share of the total number of ration rights.

5.3.2 State Ration Reserve

States will have considerable discretion in the administration of their reserves of ration rights set aside for local board issuance. If a state finds a large number of hardship cases in suburban and rural areas (possibly because of the lack of adequate public transportation) the state may transfer a larger share of its reserve to local boards in these areas.

Appendix to Part 5

DRIVERS' LICENSES: ALTERNATIVE BASIS FOR RATION ENTITLEMENTS

A great deal of attention has been paid to the relative merits of basing ration entitlements on motor vehicle ownership and on possession of a driver's license. Both options have merit and both have flaws. In the plan that has been transmitted to the Congress for review, we have based allotments for personal use, as opposed to commercial or governmental use, on motor vehicle ownership and not on drivers' licenses. It is our carefully considered judgment that structuring the plan in this way is, on balance, more equitable and leads to a rationing system that is more sound. We acknowledge, however, that different views of equity might lead to different conclusions regarding how to structure the allotments mechanism.

In this appendix, we examine the approach of issuing allotments to all licensed drivers, and compare this with the issuance of allotments to motor vehicle owners.

An allotment system that distributed allotments to all licensed drivers would provide ration rights to many individuals who do not drive or do so only occasionally. Because rights would be marketable, recipients would in many instances sell their coupons, thereby receiving a windfall gain at the expense of those who use fuel in excess of their allotments.

An entitlement system based on vehicles also treats households in rural and suburban areas more equitably than would a system

based on possession of a driver's license. This is supported by the data presented in 5.3 above.

In Section 5.2, we presented data indicating the effect that a vehicle-based rationing plan would have on households at different income levels. Using the same data, we can compare the effects of a plan that would issue allotments to all licensed drivers.

Because the data base does not contain information on the number of licensed drivers per household, we used the number of adults--persons 18 years of age or older--as a proxy for licensed drivers. This appears to be an acceptable procedure, particularly since most of those who are eligible for licenses would be likely to obtain them under a rationing plan that provided entitlements to licensed drivers, because of the market value that an entitlement would have.

We can compare the equity of the two alternatives according to the information shown in Exhibit 5-5 for seven income groups. By looking at the number of vehicles, the number of adults, and the gasoline used per household in each income group, we can see which rationing plan would most closely meet the needs of the average household in each group. In particular, we are able to examine the view that a vehicle based plan would favor the wealthy while a license based plan would be more equitable for lower income families.

The figures in Exhibit 5-5 show that both the vehicle and license bases for distributing allotments would tend to give larger allotments to families in higher income groups. However, gasoline consumption per household also increases with income.

Exhibit 5-5

VEHICLES, ADULTS, AND GASOLINE USE RELATIVE TO
THE NATIONAL AVERAGE FOR HOUSEHOLDS AT DIFFERENT INCOME LEVELS

<u>Household Disposable Income (1977 dollars)</u>	<u>Vehicles per Household</u>	<u>Adults per Household</u>	<u>Annual Gasoline Use per Household (gallons)</u>	<u>Annual Gasoline Use per Vehicle (gallons)</u>
Under \$5,000	0.7	1.4	422	603
\$5,000 - \$9,999	1.1	1.8	841	764
\$10,000 - \$14,999	1.5	2.0	1,277	851
\$15,000 - \$19,999	1.7	2.2	1,503	884
\$20,000 - \$24,999	2.0	2.4	1,767	884
\$25,000 - \$29,999	2.1	2.6	1,918	913
\$30,000 or more	2.3	2.7	1,955	850
All Households (National Average)	1.4	2.0	1,190	850

Source: EIA Service Report SR/EUA/79-18, Table 8, page 29.

Actually, despite the fact that number of vehicles per household increases with income, so does intensity of vehicle use, as measured by gasoline use per vehicle.

In Exhibit 5-6, the information in Exhibit 5-5 is expressed as ratios to the national average. The last two columns provide the desired comparison of the two alternative rationing plans. The first of these columns confirms that lower-income households do receive more ration rights under a license-based plan than under a vehicle-based plan. This occurs because relative to the national average, households in these income groups have more adults (0.7 and 0.9 respectively) than vehicles (0.5 and 0.79). However, the last column shows that the vehicle-based plan comes closer to matching historical usage patterns than does the license-based plan for every income class. The reason for this is that, relative to the national average, gasoline use corresponds more closely with number of vehicles than with number of adults for each income group.

Next we made a comparison of the quantitative effect on households with different income levels of a rationing plan based on motor vehicles with one based on drivers' licenses, again using number of adults as a measure of licensed drivers. In making the computations, the following assumptions were made:

- The per vehicle allotment would equal 70 percent of average per vehicle fuel use, under a vehicle plan, or 70 percent of average per adult fuel use, under a plan based on licenses.

Exhibit 5-6

RATIO TO NATIONAL AVERAGE OF VEHICLES, ADULTS, AND GASOLINE USE
FOR HOUSEHOLDS AT DIFFERENT INCOME LEVELS

<u>Household Disposable Income (1977 dollars)</u>	<u>Vehicles</u>	<u>Adults</u>	<u>Annual Gasoline Use</u>	Which plan gives larger allotment?	Which plan gives allotment closest to historical usage?
Under \$5,000	0.50	0.70	0.35	licenses	vehicles
\$5,000 - \$9,999	0.79	0.90	0.71	licenses	vehicles
\$10,000 - \$14,999	1.07	1.00	1.07	vehicles	vehicles
\$15,00 - \$19,999	1.21	1.10	1.26	vehicles	vehicles
\$20,000 - \$24,999	1.43	1.20	1.48	vehicles	vehicles
\$25,000 - \$29,999	1.50	1.30	1.61	vehicles	vehicles
\$30,000 or more	1.64	1.35	1.64	vehicles	vehicles

Source: EIA Service Report SR/EUA/79-18, Table 8, page 29.

- Each household would reduce its fuel consumption by 30 percent, so that fuel use by households as a whole would equal total allotments received by all households.

- A household with excess allotments would sell them to households whose allotments were insufficient.

- The selling price of an allotment would be \$1.70 per gallon.

The results are presented in Exhibit 5-7.

The table shows that under a plan in which allotments are made on the basis of vehicle registrations, the average low income household would receive coupons in excess of its fuel use and would sell these coupons, thereby augmenting its income. The average high income household, on the other hand, would be a net purchaser of coupons.

Exhibit 5-7 also shows the income distributive effects of a rationing plan that would provide entitlements to all licensed drivers. This analysis confirms that providing entitlements to licensed drivers increases the income transfers from households with higher incomes to those with lower incomes. This results principally because vehicle ownership per adult does tend to increase with household income. It should be noted, however, that while lower income households would derive greater

Exhibit 5-7

AVERAGE HOUSEHOLD ANNUAL NET VALUE
OF ALLOTMENT SALES (PURCHASES)

<u>Household Disposable Income</u>	<u>Vehicle Based Plan</u>	<u>License Based Plan</u>
(1977 dollars)	(1980 dollars)	(1980 dollars)
Under 5,000	163	460
5,000 - 9,999	97	247
10,000 - 4,999	(39)	(79)
15,000 - 19,999	(65)	(201)
20,000 - 24,999	(154)	(377)
25,000 - 29,999	(158)	(408)
30,000 or more	(97)	(405)

Source: EIA Service Report SR/EUA/79-18.

benefits from a license-based system, such a system would increase the costs for not only high income households (above \$30,000) but also for middle income households (between \$10,000 and \$30,000).

Thus, our analysis shows that households with income below \$10,000 would indeed derive a greater benefit from a license-based plan than a vehicle based plan. But the more significant factor that should be derived from this analysis is that households with incomes below \$10,000 would also derive a net benefit from a vehicle-based plan, with much less adverse impact on middle income families. The vehicle based plan would therefore appear to be the preferable option, because it is more likely to provide allotments roughly in proportion to need and would reduce the magnitude of ration rights transfers among households.

6. MEASURES TO ESTABLISH A RATIONING SYSTEM

Section 6.1 describes the measures taken to date to establish a system for rationing gasoline. The remainder of Part 6 describes the measures that remain to be taken, a timetable for their completion, and an estimate of their costs.

6.1 Measures Taken to Date

On December 10, 1979, the Department of Energy published in the Federal Register a Notice of Proposed Rulemaking and Public Hearings to receive comments on its proposed Standby Gasoline Rationing Plan. The comment period was established for 30 days, closing on January 9, 1980.

In January, the Department conducted a systematic review of the more than 1,500 written comments received and the testimony presented at the public hearings. In the light of this review, the proposed regulations were revised and a final rulemaking was prepared for transmittal to the Federal Register for publication, concurrent with the plan's transmittal to the Congress for review.

6.1.1 Costs Incurred To Date

From the date of enactment of the EECA, the following estimated costs were incurred for the development of the standby gasoline rationing plan, including the proposed and final regulations, preparation of this report, conducting the public hearings, and review of the public comments:

Salaries (3 manyears)	\$144,000
Consulting services	\$ 47,000
Other costs (principally printing)	<u>\$ 4,000</u>
Total Costs	\$195,000

6.2 Phases of Rationing System Development

Measures that remain to be taken for the establishment and operation of a gasoline rationing system can be grouped according to the following time phases:

Phase I. Preimplementation. This phase starts with the development of a detailed work plan for the management of the total preimplementation effort and concludes when the rationing system has achieved the targeted state of operational readiness.

Phase II. Readiness Maintenance. In this phase the rationing system is maintained in a state of readiness for mobilization into operating status.

Phase III. Mobilization. In this phase, which follows the decision to begin rationing, all the necessary steps are taken to have the program in operation on schedule.

Phase IV. Operation. In this phase the rationing program starts, operates, and is systematically closed out when rationing is ended.

6.3 Preimplementation

The activities involved in bringing the plan to a state of operational readiness will be subdivided into two consecutive phases. These are: (1) developing and instituting a detailed plan for managing the entire preimplementation effort, and (2) completing the preimplementation tasks.

6.3.1 Management Plan Development

The first element of this phase of the preimplementation effort, which is now in preparation, is a detailed work plan that incorporates the scope of the tasks, the resource requirements and a time schedule. When this work plan is completed, a systems management and integration contract will be awarded. The magnitude, complexity, and interrelatedness of the preimplementation program make it necessary to engage the services of an experienced systems integration contractor. The award of this contract will complete the first phase of the preimplementation effort.

6.3.2 Preimplementation Task Activities

This phase will involve undertaking 16 work packages which address functions specified in the Standby Gasoline Rationing Plan, as follows:

Allotment Planning. Prescribes procedures to allot ration rights to all eligible recipients and to the state and national reserves, during each ration period.

Ration Check Production. Provides for the manufacture of blank ration allotment checks to be available for the distribution of entitlements to ration rights recipients.

National Vehicle Registration File. Undertakes the development of a National Vehicle Registration File that will provide the data base for allotments to eligible recipients.

Ration Check Issuance and Reconciliation. Plans for distribution of government issued ration checks prior to each ration period, and the reconciliation and accounting for government ration checks.

Coupon Production. Plans for manufacture of sufficient coupons to permit efficient operation of the rationing program during each ration period. (Depending on circumstances and the availability of funds [authorized and appropriated] actual coupon printing and storing could begin during this preimplementation phase.)

Coupon Distribution. Establishes distribution procedures to ensure that ration coupons are available in sufficient quantities throughout the Nation to meet the needs of each area.

Ration Banking Operations. Develops systems and procedures for the processing of ration rights through redemption bank accounts after they have been exchanged for gasoline. Does the same for ration bank accounts opened by end users for the deposit and withdrawal of unused ration rights.

Federal Organization. Plans the Federal organization required to direct and manage rationing mobilization and operation, and develops the procedures for program management.

State and Local Roles. Establishes guidelines and procedures for States to administer State Ration Reserves and to operate State Ration Offices and local boards.

Allocation Program Interface. Provides for the rationing program's interface with that portion of the DOE gasoline allocation system as may remain in place during rationing.

Ration Rights Market Operations. Develops procedures for Federal assistance with the exchange of ration rights among individuals and firms, and for possible Federal intervention in the market to prevent abuses and to equilibrate ration rights issued with the available supply of gasoline.

Adjustment and Appeals. Specifies procedures to hear appeals from individuals and organizations and to make necessary adjustments.

Audit and Enforcement. Specifies procedures to ensure compliance with rationing regulations by individuals, firms, commercial banks, the petroleum industry and others.

Management Information Systems. Develops the management information systems not described elsewhere needed to operate the rationing program.

Public Information. Designs a program to inform the public of fuel shortages, ration system operations and program changes, and to encourage compliance.

Readiness Maintenance. Provides for maintaining and updating systems and procedures while plan is in standby status.

6.3.3 Role of State and Local Government in Preimplementation

The current plan calls for a larger state role in administering allotments and addressing imbalances within each state than the previous plan. In order to develop a joint federal/state strategy for the effective implementation of rationing, the Department intends to solicit state participation in the preimplementation effort. The states will be asked to cooperate in the following efforts:

- Developing estimates, guidelines, and procedures for funding of state planning, maintenance, and mobilization efforts in connection with the rationing plan.
- Developing specifications for functions and authorities to be delegated to the states.
- Establishing guidelines for the development of state ration plans.
- Developing guidelines for policies and procedures to be used by State Rationing Offices and local boards.
- Establishing procedures and methods for the secure distribution of ration coupons and establishing procedures for managing ration reserves.
- Preparing model public information materials for distribution by state and local boards.
- Developing procedures for continuing program coordination between DOE and the states.

The Department intends to cooperate with the states in these efforts through the National Governors' Association. The Department also plans to consult and cooperate with organizations representing local governments.

6.3.4 Preimplementation Schedule and Costs

Preimplementation planning has already begun and a rationing project office is being formed in DOE to carry out the preimplementation activities. Once the plan has been approved by the Congress, under the procedures established under the Emergency Energy Conservation Act of 1979 (P.L. 96-102), and Congress has appropriated the funds needed to defray the cost of preimplementation, the rationing project office will begin the activities contained in the 16 preimplementation work packages. Preimplementation will be completed as quickly as feasible, consistent with quality workmanship and prudent cost controls. DOE will make every effort to complete preimplementation in 12 months. It cannot be done in less time; it could, however, take longer given the magnitude and complexity of the task and substantial unknowns about the details of the work required, and if contracting procedures cannot be significantly expedited. A firm estimate of the time required to complete preimplementation will not be available until a comprehensive management plan is developed at the beginning of the preimplementation process.

Because the time to complete the preimplementation tasks cannot be further reduced, the Department is undertaking an indepth analysis of alternative measures, capable of more rapid implementation, to serve as transitional systems to full scale rationing. In addition, the standby conservation plan published in the Federal Register on February 17, 1980 proposed a series of measures aimed primarily at reducing gasoline consumption. Following a series of public hearings

the Department is now undertaking an intensive regulatory analysis of each of these measures. These measures could also be employed to curtail consumption during the period prior to the start of the rationing program.

Exhibit 6-1 presents the estimated costs of preimplementing the rationing plan.

6.4 Readiness Maintenance

Following the completion of the preimplementation tasks, the standby plan will require ongoing maintenance to prevent obsolescence and keep it in a state of useable readiness. Among the readiness maintenance functions there will be such tasks as updating the various data files and information systems, especially the National Vehicle Registration File (NVRF) with additions, changes and deletions reported by states and other sources. There will also be equipment maintenance to perform, contracts to review and update, and demonstration projects to carry out.

Preliminary DOE estimates of the annual cost that would be incurred to keep the plan in readiness status range between \$25 and \$39 million.^{1/}

6.5 Mobilization and Operation of Rationing

The mobilization phase is the interval from the time activation of the rationing plan has been authorized until

^{1/} These estimates are preliminary at this stage. Firmer estimates will become available when the preimplementation phase is completed.

the actual start of rationing. It is DOE's objective to be able to put the plan into operation within 90 days from the date activation has been authorized.

Following rationing plan mobilization, the operations phase covers the day-to-day administration of the standby gasoline rationing program as described in Part 2, above.

6.6 Cost of Mobilization, and Operations

Exhibit 6-2 presents DOE estimates of the following costs: 1/

- Mobilization: the costs that would be incurred during the three-month period in which the plan were being activated.
- Operations: the quarterly cost that would be incurred for operating the plan following mobilization.

1/ These estimates are preliminary at this stage. Firmer estimates will become available when the preimplementation phase is completed.

Exhibit 6-1

RATIONING PLAN PREIMPLEMENTATION COST ESTIMATES
(1980 dollars)

	<u>Estimated Costs</u>
Allotment Planning	\$ 7,209,000 ^{1/}
Ration Check Production	\$ 4,200,000
Ration Check Issuance and Reconciliation, and National Vehicle Registration File	\$ 21,000,000
Coupon Production	\$ 18,000,000 ^{2/}
Coupon Distribution	\$ 500,000
Banking Operations	\$ 600,000
Federal Organization	\$ 200,000
State and Local Roles/Functions	\$ 10,874,000
Allocation Program Interface	\$ 300,000
Ration Rights Market Operations	\$ 700,000
Adjustment and Appeals	\$ 200,000
Audit and Enforcement	\$ 400,000
Management Information Systems	\$ 5,315,000
Public Information	\$ 4,700,000 ^{3/}
Program Management and Systems Integration Contractor	\$ 7,002,000
Program Readiness and Maintenance	\$ 300,000
Alternative Systems Design Concept Proposals ^{4/}	\$ 1,500,000
Management Reserve	\$ <u>20,000,000</u>
TOTAL	\$ 103,000,000

^{1/} Cost may be offset by requiring firms to pay application fees.

^{2/} Assumes printing 5.0 billion new coupons.

^{3/} Assumes free advertising space in all media.

^{4/} Consists of analysis of alternative approaches to rationing based on modern computer and telecommunications technology to avoid dependence on coupons and checks.

Exhibit 6-2

RATIONING PROGRAM COST ESTIMATES FOR MOBILIZATION AND OPERATIONS
(in millions of 1980 dollars)

	<u>Mobilization</u>	<u>Quarterly</u> <u>Operations</u>
	1/	1/
Allotment Planning	\$ 2.3	\$ 1.8
Ration Check Production	2.9	4.6
Ration Check Issuance and Reconciliation, and National Vehicle Registration File	23.2	30.0
Coupon Production	17.3 ^{2/}	17.3 ^{2/}
Coupon Distribution	116.5	132.4
Banking Operations	18.3	101.5
Federal Organization	0	0
State and Local Roles/Functions	202.6	134.3
Allocation Program Interface	6.5	0.7
Ration Rights Market Operations	0.1	0.1 ^{3/}
Adjustments and Appeals	53.4	19.3
Audit and Enforcement	8.4	16.8
Management Information Systems	0.9	0.8
Public Information	7.5 ^{4/}	8.8 ^{4/}
Program Management and Systems Integration Contractor	3.9	6.0
TOTAL	\$463.8	\$474.4

6-12

Exhibit 6-2--cont'd

1/ Costs may be offset by requiring firms to pay application fees.

2/ Assumes printing 5.0 billion new coupons.

3/ Does not include funds for government purchases of ration rights, if necessary, in the ration rights market.

4/ Assumes free advertising space in all media.

6.7 Diesel Fuel Rationing

The legislation requiring the development of a rationing plan specifies its application to "diesel fuel used in motor vehicles" as well as to gasoline. There are, however, such major differences between the supply and product characteristics of diesel fuel and gasoline as to make it impractical to ration them both by the same methods.

In fact, the problems inherent in a rationing system applicable only to "diesel fuel used in motor vehicles" raise serious doubts of its feasibility. By way of illustration, diesel fuel and home heating oils are readily interchangeable, giving rise to a situation that could make compliance with diesel fuel rationing regulations enforceable only at an intolerable cost. Because of this and other problems associated with the rationing of diesel fuel, the Department has devoted its resources to the design and development of a system for rationing gasoline. The Department proposes to conduct a thorough study of the feasibility of diesel fuel rationing after the gasoline rationing plan has been adopted as a standby measure. At the conclusion of this feasibility study, the Department will present its findings in a report to the jurisdictional committees of Congress.

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